Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.
THE APPLE INDUSTRY IN THE UNITED STATES

A Selected List of References on the Economic Aspects of the Industry Together With Some References on Varieties.

Compiled by Louise O. Bercaw,
Under the Direction of Mary G. Lacy, Librarian,
Bureau of Agricultural Economics.

Washington, D. C.
June, 1927
INTRODUCTION

This bibliography consists of references to books, bulletins, and pamphlets dealing with the economic aspects of the apple industry in the United States. Periodical articles, as a rule, have been omitted. Some references to general publications on fruit which include apples have been given, but no attempt was made to include them all.

Although, as a rule, material on orchard culture and management has been omitted the bibliography contains occasional references to such publications as have been found to contain statistical data. Following the main bibliography is a list of references on varieties of apples (p.115). While it is not presented as a complete list it is fairly comprehensive.

It was not practicable to examine the complete files of the reports, proceedings, and transactions of the various horticultural societies, the statistical reports and bulletins of the state departments of agriculture, or all of the publications of the International Apple Shippers' Association. However, numerous references to most of them have been included in this list. For possible additional data the publications noted above, as well as the files of periodicals such as Better Fruit, American Fruit Grower Magazine, etc., should be examined.

No attempt has been made to search the statutes of each state for laws but when references to them have been found they have been included.

Certain publications of the U. S. Department of Agriculture, U. S. Department of Commerce, and the U. S. Bureau of the Census have been described in detail as to what they contain on apples. In some cases complete files have been described, in others only the latest volume, or those volumes which contain a series of figures over a period of years. In any case the student wishing earlier, or perhaps complete, sets of figures should examine the whole file. It was, of course, impossible to examine every publication which might contain data on apples but it is hoped that those listed will be found useful and suggestive.

Numbers following most of the entries are the call numbers used in the Library of the U. S. Department of Agriculture. The words "Pam.Coll." following some of the entries refer to the location of the reference either in the Library of the U. S. Department of Agriculture or the Library of the U. S. Bureau of Agricultural Economics.

Assistance and helpful advice have been received from Mr. W. H. Youngman of the Division of Farm Management and Costs, Bureau of Agricultural Economics, U. S. Department of Agriculture.

Mary G. Lacy, Librarian,
Bureau of Agricultural Economics,
U. S. Department of Agriculture.

June, 1927.
SOURCES CONSULTED

1. Card catalogues of the following libraries:
   - U. S. Dept. of Agriculture. Library.

2. Indexes:
   - Experiment Station Record, v.1, Sept. 1889 - v.56, no.2, Feb. 1927.

3. Bibliographies:
     The apple section only of this bibliography was examined. The general sections on Fruits are suggested as additional sources for students making a more comprehensive study of the subject.
   - Rice, E. C. Bibliography on the preservation of fruits and vegetables in transit and storage, with annotations. Washington, 1922. 76p. (U. S. Dept. Agr./Bibliographical Contributions, no.4)
   - U. S. Bureau of foreign and domestic commerce. Market research agencies. Washington, Govt. print. off., 1926. (Domestic commerce series no.6)
THE APPLE INDUSTRY IN THE UNITED STATES
A Selected List of References on the Economic Aspects of the Industry together with Some References on Varieties

Compiled by Louise O. Bercaw,
under the direction of Mary G. Lacy, Librarian,
Bureau of Agricultural Economics

Picking, packing, and storing apples: p.4-6.
Varieties adapted to West Virginia: p.13-14.

Table I, Items of cost of producing 1 pound of apple paste: p.12.

3. Adams, R. L. Farm management notes (for California) 7th ed. Berkeley, Distributed by Associated students' store, University of California, 1921. 122p. 20.2 Adl
Costs and prices data are given for both pre-war (1915-16) and war time (1918-19) periods for alfalfa, almonds, apples, apricots, asparagus, barley, beans, lima beans, cabbage, cherries, corn, cotton, figs, raisin grapes, table grapes, grain hay, hops, lemons, oats, olives, onions, oranges, peaches, pears, peas, plums, potatoes, prunes, rice, sorghum, stock beets, sugar beets, sweet potatoes, tomatoes, walnuts, and wheat.

The writer discusses the advantages of and the construction of the air-cooled storage house.

"Varieties of apples best adapted to barrel and to box packing, Picking the fruit. Barrel packing, facing, filling, papering; the barrel press. Box packing, wrapping the apples, lining the bulge, the press, labeling. Packing peaches."-U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.

The author first discusses the causes leading to the decadence of old orchards and methods of restoring them, then he gives the records of six West Virginia orchards restored to profitable production under the supervision of A. E. Lacy, Assistant Horticulturist. Detailed financial statements are given for each orchard. Figures are mainly for the years 1909, 1910, and 1911.
   "Partial bibliography": p.48-51.
   Tables show effect of fertilization on size of tree, on total yield, on bloom, etc.

   Briefly tells something of "our practical experience in running our cooperative selling organization for apples, known as the Martinsburg Fruit Exchange."

   Consists mainly of tabular statements of recorded shipments of apples from the counties and sections of Virginia for the years 1899-1903, inclusive; and origin and distribution of shipments, 1901 and 1903.


    "Orcharding in Virginia, thus far, is merely an incident and not a real industry in the sense of well planned careful ventures."-p.87.

    "Statistics obtained in cooperation with the traffic managers of Virginia railroads are given for the shipment of apples from each station along the line of the different roads. Indication is made as to the destination of the shipment, whether to northern or southern tide water, northern or western States, local markets within the State, or to Southern States. The matter is also grouped with reference to the apple production of different counties. The shipments of dried apples are noted in some instances. The data are given in detail for 1899. Some data for 1897 and 1898 are also reported."-Exp. Sta. Record, v.12, p.445.

    "This bulletin gives the results of experiments made at the station to find some profitable use for low-grade fruit."-Exp. Sta. Record, v.8, p.997. Cider making, the manufacture of jelly, marmalade, and vinegar are discussed.

   [162]p. 81 Am34
   "List of members and orchard statistics": p.154-158. This consists
of a list of the members with addresses and locations of their orchards, acreage in each orchard, total number of trees and number of bearing trees in each orchard, and number of trees in each orchard classified by varieties.


"Aims to put before you, the apple grower of the American Northwest, in a simple way the advantage to you of marketing your apple crop."
Contains a short table giving carlot consumption of Northwestern apples in Boston under private sale for the seasons of 1911/12-1914/15, inclusive.


"The results of an orchard survey conducted by the Department of horticulture, Pennsylvania state college and the Pennsylvania State department of agriculture."
This very comprehensive bulletin covers many different phases of the industry - history of apple growing, characteristics of apple culture in the different sections of the state, the apple survey, soils of the Pennsylvania fruit regions, cultural methods, marketing, and cost of growing apples.
It contains numerous charts and tables giving information such as the following: value of orchard products, 1870, 1880; number of trees, bearing and non-bearing, 1890, 1900, 1910, and 1920, and apple production, 1919, by counties; carlot shipments 1916 to 1920, inclusive; etc.
The appendix contains also Rules and regulations for the packing of apples in Pennsylvania, proposed Pennsylvania apple grades, a list of Commercial cold storage houses in Pennsylvania, and a List of Pennsylvania by-product plants.


"Presents the results of a food consumption, production, and distribution survey of Charleston, West Virginia, and its trade territory... The study was begun in February, 1924, and data were collected for the twelve months period ending December 31, 1923." p.5
Table showing receipts and shipments of apples and other selected food commodities in Charleston: p.21.
Freight rates on car-lot shipments of apples, and other perishable commodities from shipping point to Charleston: p.22.
Boat charges from Point Pleasant and along the Kanawha into Charleston on apples, per barrel and per bushel, and on other commodities: p.23.
Fruit is discussed on p.52-53.


"This bulletin presents the results of a survey of the commercial apple orchards in Berkeley County, made during the summers of 1912 and 1913. Information is also given relative to the importance and distribution of the other fruit industries in Berkeley County, together with statistics on the fruit industries of West Virginia as a whole."-Exp. Sta. Record, v.33, p.339.

There are fifty tables covering such items as production, value of crops, number and acreage of trees, plantings by years, 1863 to 1913, size of orchards, relation of management, soils, fertilizer to yields and incomes, costs of spraying, man and horse labor, picking, packing and hauling crop, yield per tree, price per barrel, gross income per tree, total cost of production per barrel, etc.


"Bibliography on apple thinning": p.54-55.
"Partial bibliography on peach thinning": p.56.
"This bulletin reports thinning experiments carried on by the station for the 5-year period 1912 to 1916... The results of other investigators dealing with thinning apples are cited."-Exp. Sta. Record, v.37, p.448-449.

Illustrated by a number of tables. Several of these show cost of thinning per tree.


The writer has used the daily market reports of the United States Department of Agriculture as the source of the information presented in this paper. Tables give average price received per variety (all markets considered) 1919, 1920, 1921, 1922, and 1923; average price per barrel on different city markets for the same years; four months' average price per barrel received for Grimes Golden, Jonathan, Stayman Winesap, York Imperial, Arkansas, McIntosh, Baldwin, and Ben Davis apples on the different markets for the same years; and four months' average price paid for each variety on the New York, Washington, Boston, Philadelphia, Baltimore, and Kansas City markets for the same years.


"Synopsis. - A discussion of the causes of the small apple crops in late years, with letters from a number of prominent orchardists in regard to experience with spraying trees. For the production of large crops is advised liberal tilling, efficient fertilizing, careful pruning, and judicious spraying."-Exp. Sta. Record, v.6, p.988,
   Apple: v.1, p.312-333.
   This section consists of signed articles on various phases of the subject, varieties, monuments erected to a few of the most noted varieties of apples, cultural practices, marketing, etc.
   Some of the titles are: Apple-growing in the northeastern states, by C. D. Jarvis; The apple in Canada, by W. T. Macoun; The apple in the southern Alleghany Mountain, by W. A. Taylor; The apple in mid-continental or plains districts, by S. A. Peach; and Apple-growing in the western mountain states, by O. B. Whipple.

   This consists of a description of a combination storage cellar and packing house on the Moses Fell Annex Farm at Bedford, Ind. Plans are included.

   On page 587 there is a map showing approximate acreage of Ben Davis apple trees of all ages in 1909 and dates when picking of apples begins.

   A discussion of the law.

   The first part of the bulletin deals with experiments and culture of the apple. The section on culture is taken largely from an earlier bulletin by C. P. Close.
   "Apple industry in the East": p.3
   Harvesting, grading and packing: p.31-41.
   "Cost of maintaining and establishing an orchard": p.52-56.
   Figures are for the years 1903-1913, inclusive.

   "Studies are reported which show that a number of factors contribute to the internal browning of the fruit in storage, and that it is not caused by a parasitic organism."-Exp. Sta. Record, v.48, p.147.

29. Ballou, F. H. Rejuvenation of the apple growing industry in southeastern Ohio; with discussion. (In Ind. horticultural soc. Trans. 1924, p.81-97) 81 In2
   Relates the results of experimental work carried on by the Ohio Agricultural Experiment Station.
   This is one of a series of bulletins on orchard rejuvenation in southeastern Ohio. Earlier reports are to be found in Bulletins 180, 217, 222, 240, and 301. There are several tables. One of them (p.12) shows average yield per acre per year, value of crop per acre per year, cost of cultivation and net returns per acre per year by different methods of cultivation in the Benedict orchard for the years 1914-'15-'16-'17.18.

   "A popular bulletin of information relative to premium lists and rules for fruit exhibits, preparing exhibits, characteristics of show fruit, transportation of show fruit, nomenclature, score cards, district displays and important points to be observed in exhibiting fruit."-Exp. Sta. Record, v.32, p.141.

32. Bassett, A. K. Selling apples direct to the consumer. (In Wisc. state horticultural soc. Rept. v.48, 1917/18, p.97-102) 81 W75T

   The author briefly discusses the advantages and weak points of 6 common methods of disposing of the apple crop.


   "Results of experiments showing life in storage of 205 varieties of apples. Discussion of results regarding coloring, maturity, cellar storage, mechanical and ice cold storage, size of apples, scald."-U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.
   There is also an eleven-page popular edition of this bulletin entitled Keeping Quality of Apples.

   "This bulletin is the second of a series of reviews of the storage reports of the Bureau of markets... [and] reviews the season 1917-1918."

   "Statistics are given showing the actual quantities of different commodities [apples, butter, American cheese, eggs, frozen and cured meats and lard, and fish] held in storage in 1916-1917, as reported from the warehouses, comparison being made with reports of other months and years."
38. Berckmans, P. J. History of fruit growing in Alabama. (In Ala. Dept. Agr. Bul. 36, p.103-107 [Ala. state hort. soc. Repts. 5-7]) 81 All deals mostly with peaches, but apples and pears are mentioned.


The results of the ripening and the respiration of apples in common and cold storage are summarized in charts and tables.

40. Bird, H. S. Important factors in the successful cold storage of apples. (In Mont. horticultural soc. Proc. 19th, 1913, p.54-55) 81 M762

"A brief discussion of the factors essential to the successful cold storage of apples, including some experimental data illustrating the damage by scald and decay due to storing immature fruit, over-mature fruit, and to delay in storage after picking the fruit."-Exp. Sta. Record. v.37, p.833.

41. Blair, J. C. The apple package. (In Ill. state horticultural soc. Trans. v.37, new ser. 1903, p.143-168) 81 116

Pages 161-163 consist of discussion on Mr. Blair's paper.


Treats of the sections adapted to apple growing, suitable sites and soils, preparation of soils, varieties of apples valuable for commercial purposes, cultivation, pruning, insects and diseases, and the handling and disposition of apple crops.


A study of winter injury in Michigan orchards.


The author writes on advertising as a means to selling Illinois apples.


Table IV, p.16, Performance record of each orchard before and after renovation (gives approximate yield, whether culls or not, amount sold, and income).


The estimated cost of making cider at home is discussed on p.32-34. Estimated figures are given.

A tabulated summary of acre and bushel costs and profits in Minnesota apple orchards is given on p.12.

Gives detailed per acre and per bushel costs and profits.

"A contribution from the University of Minnesota, 1920, presenting data on an orchard survey conducted in 1918-19 by W. J. Koppen under the direction of the author."

Average costs and returns from 64 orchards. In tabulating data the emphasis was placed upon normal conditions.

"List of fungi which have been isolated from market and storage apples and which are capable of producing rot."-U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.


"Literature cited": p.216-217.
"A report on Jonathan spot and scale of apples (Malus sylvestris), including a study of their relation to rot infection and the modifying effects of storage conditions and maturity of fruit."-p.287.

"Gives a report of studies on the nature and control of apple-scald, including experiments upon the relation of orchard and storage conditions to the development of the disease."-p.195.


"Literature cited": p.240.
"The foregoing experiments show that the occurrence of apple-scald is determined by orchard, packing house, transportation, and storage condition... The amount of scald developed in cold storage plants has varied greatly with the location in the room."-p.229.


61. Brown, B. S. Modern fruit marketing. A complete treatise covering harvesting, packing, storing, transporting and selling of fruit. New York, Orange Judd co., 1916. 287p. 43 Bk.1
This is a general treatise on the subject, but there are numerous references to apples. For cost of packing apples see pages 80 and 81.

"This bulletin is a six-year summary of apple-orchard economics and practices in Hood River Valley. The period covered extends from 1913 to 1918. Studies of two distinct three-year periods are also included; namely, 1913-1915 and 1916-1913."-p.34.
There are numerous tables giving statistics such as average annual yields in packed boxes per acre and per tree for two three-year periods; distribution of growers, showing average annual yields in packed boxes per acre for the period 1913-1918, inclusive; average net price per box received by growers for apples during the years 1913-1918, inclusive; gross annual value of fruit per acre and per
box for 1913-1918, inclusive; wages per day; cost of materials used; relation of yields, sizes, and gross value of fruit per acre to percentage of orchard cultivated, costs per acre and per box, to topography of orchards, number and character of irrigations, labor costs per acre and per box, to percentage of orchard pruned, thinning and propping, including costs per acre and per box, etc.


The chapters on agricultural development contain several references to fruit growing, but the only reference to a possible culture of fruit for commercial purposes is on p.469, v.1, "The yield was not always consumed either by the hogs or the different persons belonging to the estates on which the trees were situated; the popularity of cider induced many landowners to rent their orchards, and a considerable income was secured from this source. Thus in 1697, Mrs. Mary Naylor, of Elizabeth City County, received from Jacob Walker ten pounds sterling for the lease of her fruit trees in that year. [Records of Elizabeth City County, v.1684-1699, p.144]

Fitzhugh, in describing his orchard of twenty-five hundred apple trees, declared that it ought in a few years bring in an annual sum of fifteen thousand pounds of tobacco." [Letters of Hn. Fitzhugh, April 22, 1666]


"This bulletin deals primarily with the prices of the 1925-26 commercial crop of apples, and freight rates to the principal markets. There are included the prices paid to growers, wholesale prices, and retail prices, together with general statistical data and charts on production and distribution and other general information concerning the apple industry of the United States."—p.1.


"This bulletin is a study of the production, rail shipments, and unloads of sixteen fruit and vegetable crops in the United States during the year 1925. All of the tabulations were compiled from records of the United States Department of Agriculture."—p.4.

Products included are apples, grapes, peaches, oranges, grapefruit, lemons, strawberries, cantaloupes, watermelons, cabbage, celery, lettuce, onions, white and sweet potatoes, and tomatoes.


"Partly adapted from Circular no.59, Purdue University Experiment Station."
67. Burkholder, C. L. Starting the apple orchard. LaFayette, Ind., 1926. 27p. (Ind. Agr. Exp. Sta. Circ. 132) Pages 2-7 deal with the cost of establishing an orchard. On page 6 there is a table which shows in detail receipts and expenditures on 44 acres of apples for first ten years - planted 1915. Pages 10-15 deal with varieties of apples.

68. Burritt, N. C. Apple growing. N. Y., Outing Publishing Co., 1912: 177p. 93 E94 Includes chapters on harvesting and storing, markets and marketing. There is also a chapter on the cost of growing apples which contains tables. One table gives detailed costs of producing apples in a six acre orchard for the years 1902-1911, inclusive.

69. Burritt, N. C. Cost of an apple orchard to bearing age. (In Rural New Yorker, v.73, nos.4245-4247, Mar. 7-21, 1914, p.544, 406, 468) 6 R98 "The author outlines his methods of keeping records and presents data showing the cost of growing to bearing age of two particular apple orchards, one 11 years old filled one way with plums and the other 6 years old filled both ways with peaches."-Exp. Sta. Record, v.31, p.45.

70. Burritt, N. C. The cost of growing apple and peach trees to bearing age. (In W. Va. state horticultural soc. Rept. 21st, 1913, p.58-71) 81 T52 The author's remarks are based upon the costs of growing trees upon a single farm, representative of conditions in the Western New York fruit belt. Tables are included.


72. Burritt, N. C. The profitable management of the small apple orchard on the general farm. Washington, 1912. 32p. (U. S. Dopt. Agr. Farmers' bul. 491) "References on the subject of orchard renovation": p.21. "This paper deals with the question of rejuvenating old apple orchards, which has been a subject of much inquiry. While the statistics used in connection with some of the discussions are compiled from data collected in a northern apple-growing region, the application of them is made from the standpoint of the problem in question and the fundamental principles involved."-p.2.

The following information is tabulated on pages 8, 19, 20: Number of orchards and acres surveyed in four counties in western New York from 1900 to 1903, with average yields; average yield in bushels per tree in three counties of western New York from 1900 to 1906; estimated cost of first year's work in renovating an old orchard; and income, expense, and net profits on a 6.1-acre apple or-
Renovating the Neglected Apple Orchard, by H. M. Conolly, is an adaptation of the above bulletin.


Deals particularly with the farm of M. J. English, of Broome County, N. Y. Renovating the old orchard: p.19-20. This includes a table: "Cost of and income from renovating an old 30-tree apple orchard on the English farm."


In addition to a paragraph on the extent of apple plantings in the state, the soil, cultivation, pruning, etc. there are several pages devoted to the choice of varieties and the preservation of apples by storage.


The writer gives his personal experience as a Virginia apple grower. The paper includes a table of growing, harvesting, and other costs of apples on one orchard, 1923 and 1924, in addition to discussions of standardization and state control, varieties, pollination, spraying, soil fertility, harvesting, marketing, cost of distribution, advertising, etc.


California standard apple act: p.100-112.

78. California. State commission of horticulture. Acreage totals and values of California fruits for 1918. (In its Biennial rept. 8th, 1917-18, p.5) 81 C12Rc.

Statistics of total acreage, 1917 and 1918, value, 1917, and estimated value, 1918, are given for apples.
79. California. State commission of horticulture. Apple growing in California. A practical treatise designed to cover some of the important phases of apple culture within the state. Sacramento, State print. off., 1914. 124p. 93 C132


This consists of the text of "The standard apple act of 1915" of California. A copy of this same act is in the Monthly Bulletin, v.5, no.8, Aug. 1916, p.295-299.


Apples: p.147-149. A table shows bearing acreage, average yield per acre, and production for the state and individual counties, 1909 and 1918. A map shows commercial distribution of apples.


"This account is made up of reports of a number of European consuls on the use of California fruit in different sections of Europe."-Exp. Sta. Record, v.16, p.1079. Dried apples are mentioned.


Sulzer apple packing and grade law: p.648-649.


This review contains a number of tables. Data relative to apples include the following: Carlot shipments out of the states for the years 1900-1904, inclusive; carlot shipments from north of Tehachapi for the years 1899-1904 (to Dec. 1), inclusive, exports of California apples by country of destination for the years 1899/1900-1903/04, inclusive; output of California dried apples for the years 1899-1904, inclusive; California pack of canned apples, 1901, 1902, and 1903; amount and value of dried, and green or ripe, apples from United States for the years ended June 30 of 1900-1904, inclusive; and number of bearing and non-bearing apple trees for the state and county, 1904.

   Cost of developing a twenty-acre orchard of pears and apples, on good foothill soil in Butte County (Orchard of E. Meriam, Paradise): p.370.


   The development of dehydration in California is reported on, on pages 185-187.

   The number of dehydration plants and the tonnage of apples, apricots, etc., dehydrated, and the cost of dehydrating a green ton of apples, are tabulated.


   Various studies on the apple in cold storage made by J. L. Fidler under the direction of E. L. Overholser are reported upon on pages 189-194.

88. Campfield, W. S. How to pack a show box of apples. (In Va. state horticultural soc. Rept. 23d, 1918, p.125-130) 81 V81

89. Cardwell, J. R. Early horticultural days in Oregon. (In Oreg. state hort. soc. Proc. 24th, 1909, p.67-74) 81 Or32

   "This paper contains considerable general information relative to the history and development of the fruit industry in Oregon." - Exp. Sta. Record, v.22, p.734.

   Not examined.


   "References cited": p.53-54.

   "As a contribution to the study of the cold storage of apples, the author investigated the initial freezing point of the cell sap in contact with the protoplasm, as well as the effect of subsequent degrees of freezing upon the tissue." - Exp. Sta. Record, v.53, p.727.


   "The use of oiled wrappers or shredded oil paper is said to have markedly reduced the storage scald, as compared with that of untreated fruit." - Exp. Sta. Record, v.54, p.750.


   "Immediate delivery to cold storage is important. Equipment: Reinforced concrete structure most satisfactory; brine system of cooling." - U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.
   "This comprises a detailed report for 6 seasons [1906-1911] on the cost of production and returns from a 150-acre diversified fruit farm. In addition to the figures for apples, data are also given for peaches, pears, plums, grapes, and cherries." - Exp. Sta. Record, v. 29, p. 439.


   Pages 240-254 deal with harvesting, grading and packing, and storing of apples, orchard heating, and selection of apples for exhibition purpose. Pages 254-261 consist of a list of varieties. On pages 262 and 263 there is a statement by Mr. E. P. Cohill of Hancock as to the cost of starting and maintaining an orchard. Figures cover the years 1903-1909, inclusive.

97. Cochran, G. A. Packing and handling apples. (In American Horticulturist, v. 5, no. 11, Nov. 1895, p. 163) 80 Am38
   "Brief recommendations, careful picking of perfect, well-developed fruit, and cold storage, being advised." - Exp. Sta. Record, v. 7, p. 404.

   "The purpose of this bulletin is to discuss in a popular way the various problems encountered by the person who plans to produce apples and pears."
   "Recommended varieties of apples and pears for Oklahoma": p. 22-25.

   "Description with illustrations of a typical small cold storage warehouse [Olcott, N. Y.] for apples located near the apple orchard. Size of rooms, and temperatures maintained."

Not examined.

"Reprinted from 'Orcharding', Massachusetts Agriculture series no. 2."
Includes a plan for a model storage cellar.


"After investigation and public hearing, with the approval of the Director of the Office of Colorado Director of Markets and the U. S. Department of Agriculture, the standards for the grade and other classifications of certain perishable and semi-perishable fruits and vegetables contained within this booklet are hereby promulgated, effective September 1st, 1923."-p.1.

"Five new accounting forms have been devised for use in packing houses sampling fruit by weight. These forms are intended to take the place of those described in Bulletin 590."-Exp. Sta. Record, v.46, 1922, p.391.

"The farm-management survey discussed in this bulletin was made in 1914 to check the results secured in a similar study conducted in the same area during the previous year."-(U. S. Dept. Agr. Bul. 117. Profits in Farming on Irrigated Areas in Utah Lake Valley, by E. H. Thomson and H. M. Dixon)
The following tables include data for apples: table 7, p.10,
Distribution of crop receipts on farms operated by their owners and on farms whose owners rent additional land; and table 14, p.22; man and horse labor requirements for crops.

Besides these the bulletin contains additional data on fruit and fruit farms.

Deals with the commercial apple industry of Virginia.

Bibliographical footnotes.

Contents: West Virginia's apple orchards; A study of the apple crop of our State, with suggestions for its increase; Grafting; Apple regions indicated by crop of 1898; Map showing distribution of apple areas; and Relative value of varieties. The tables listing varieties are quite complete. Information is given by counties of the state.

A reprint from the Annual Report of the Station for 1896.
"A popular article discussing the adaptability of West Virginia to apple growing, the orchards of northern West Virginia, the management of orchards, the packing and care of fruit, the longevity of fruit trees, etc."-Exp. Sta. Record, v.9, p.948.

"Besides a discussion of the profits of cold storage, the results of some experiments with apples and chestnuts in cold storage are given, and chapters added on 'Moisture in cold storage' as stated by J. E. Seibel in his Compend of mechanical refrigeration; and 'Materials of construction' as stated by A. J. Wallace-Taylor in his publication on Refrigeration and ice making. The author outlines a plan for the building of a cold-storage room, giving methods of construction and materials used."-Exp. Sta. Record, v.13, p.249.
A table, compiled from weekly market reports on the Baldwin apple for New York City as published in the American Agriculturist, giving prices for the first of each month from November to May of the
seasons 1896/97-1900/01 is to be found on p.52. No prices are given for April and May, 1901.


"Results of experiments conducted by the Department of Agriculture. Apples - colored plates showing various states of maturity; relation to storage period. Tomatoes - conditions determining storage."—U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.


"This article is not intended as a handbook of cultural information on American horticulture, but as a portrayal of the origin and development of the fruit and vegetable industry of the United States and as an expression of its present status and important trends."—p.107.

It contains two charts which include apples, and which show the total value of fruits and vegetables (by commodities), in 1919, and the value and native origin of fruits and nuts (by kinds) in 1919.


"A comprehensive survey of the horticultural industry of the United States from the viewpoint of production. The article is illustrated with numerous views and with charts showing the location and magnitude of the principal crops. The various factors of climate, soil, culture, methods of handling, and marketing, which underlie the success of the industry are discussed."—Exp. Sta. Record, v.55, p.741.

Number of apple trees and production, 1919: p.169-170.
Production of apples, total and commercial crops, 1920-1924, inclusive: p.218.


"Tables are given and discussed showing the distribution and extent of the fruit and vegetable drying industry in 1899, 1909, 1919 and 1921; the value of the principal canned products by five-year intervals from 1899 to 1919 and in 1921; and the packs of the more important canned fruits and vegetables in 1909, 1919, and 1921 by States. The vinegar, fruit juice, and specialized fruit and vegetable manufacturing industries, and the utilization of potatoes for starch and flour, are also discussed."—Exp. Sta. Record, v.55, p.787.

Statistics for apples are found on p.606, 609.

"This survey has been made as an aid toward adjusting the quality, grade and pack of locally-grown fruits and vegetables to the demands of the Providence market."-Introduction.

Apples: p.4-12. There are 7 tables giving the following information: Apple varieties preferred and number of times each variety was given first choice, second choice, etc.; number of wholesalers preferring each container or combination of containers for both early and late apples; sizes of apples wanted by retail stores and peddlers; number of chain stores, hotels, etc. preferring sized apples; estimated per cent of total apple sales to each type of trade buying from Providence market wholesalers; grades of apples wanted by various types of trade buying from wholesalers; and average number of barrels or boxes sold per sale to the various types of retail trade.


The material in this bulletin is taken from a thesis "Some economic factors concerned in the marketing of fruit" presented by Mr. Corbett to the faculty of the Graduate School of Cornell University in partial fulfillment of the requirements for the degree of doctor of philosophy in 1925. "The remainder of the thesis is in process of publication."-Letter, May 13, 1927.

A typewritten copy of the thesis is in the Library of the N. Y. State College of Agriculture, Ithaca, N. Y.

In addition to the material contained in the bulletin the thesis 
gives costs of packing fruit in the cooperative packing houses in western New York in 1922 and 1923 and trends in the number of fruit trees.

"The chief purpose of this study was to ascertain the costs of the marketing services performed by fruit and vegetable shippers in western New York and the margins taken by them... An explanation of the method of calculating the costs of handling each product is given in the appendix, pages 43 to 45."-p.3.

Statistical tables contain data relative to margins and costs at the shipping point on apples, cabbage, pears, and peaches, for 1922/23 and 1923/24; storage costs for apples packed in barrels, by months, 1923/24, average storage costs, by months for 1 barrel of apples, 1923/24; number of cars shipped, number of markets and number of states, 1922/23 and 1923/24 for apples, cabbage, pears, and peaches; and primary destinations of western and central New York apples, Sept. 15, 1924 - Mar. 27, 1925, inclusive. There are also graphs showing the time of shipment of apples, cabbage, pears, and peaches, 1922 and 1923.


The purposes of the bulletin are to present an "inventory of the agriculture of Rhode Island in more detail than is possible when the country is the basic unit" and to "furnish a 'source-book' of information concerning Rhode Island agriculture."-p.6.
Fruit industry: p.56-60. Contains several maps and a chart dealing with the number and distribution of apple and peach trees.

Table XLIV, p.110, gives the number of bearing and non-bearing apple trees in each county and in the state, 1890, 1900, 1910, 1920, and 1925. Index numbers are given for bearing trees.

Table XLVII, p.111, gives the number of bearing and non-bearing apple trees, per cent non-bearing trees of bearing trees, and production in each town for 1925.


"This bulletin contains material on production, distribution and consumption of apples in Rhode Island. In the section on distribution, some attention has been given to peaches. The results of an apple-orchard survey in which records were obtained of varieties grown, ages of trees, grades produced and prices received, are given. A number of retailers in Providence were visited and questioned concerning the most desirable varieties, grades, methods of packing, packages, etc. Their answers have been tabulated and are included. The returns from questionnaires which were mailed to consumers and which aimed to show their preferences, their knowledge of apples, their buying practices, etc., are shown."-Scope, p.4.

There are 40 tables including 3 in the appendix. There are also four diagrams dealing with the number of apple trees.

120. Cost of growing Michigan apples. (In Rural New Yorker, v.82, Dec. 22, 1923, p.1538) 6 R88

This detailed statement of cost of producing Michigan apples in 1923 is a "statement from Frank E. Warner condensed from a paper read at the Michigan State Horticultural Society meeting," and reprinted in The Grand Rapids Press.


Includes a short table giving the following information for 1909, 1910, and 1911, for an orchard managed by the writer: average cost per acre up to harvesting; average cost of harvesting per acre, including barrels; average gross and average net income per acre.


"Tables and graphs are given showing the monthly prices, monthly relative prices, and the monthly purchasing power of hogs, cattle, sheep, calves, horses, chickens, eggs, butterfat, corn, wheat, oats, hay, and apples, from January, 1910, to December, 1925; the monthly index numbers of farm prices; and the monthly hog-corn ratios for
the same period. The methods of constructing the relative prices, the index numbers, and the hog-corn ratios are described."-Exp. Sta. Record, v.55, p.589.

124. Craig, John. Phases in orchard management in Wayne County as discovered by an orchard survey. (In Western N. Y. horticultural soc. Proc. 50th, 1905, p.54-64) 81 W52P
"Abstract of an illustrated lecture."

The first part of the bulletin is of a general nature, but page 8 gives directions for picking, sorting, packing and storing apples.

126. Crandall, C. S. Picking and packing apples. (In Ill. state horticultural soc. Trans. new ser. v.37, 1903, p.575-591) 81 116
"Directions are given for picking and packing apples, with statistics on results obtained from an examination of 45 barrels of apples with regard to uniformity in size of fruits, defects caused by decay, apple scab, codling moth, and curculio."-Exp. Sta. Record, v.15, p.967.

"The report portrays the facts in the present problem of transportation of fruits and vegetables of the Far Western States and correlates the various causes of car shortage, retarded market distribution, and car movement."-Letter of submittal, p.9.
Statistical data on apples are to be found on the following pages: Unloads by consumption centers, 1923, p.8-9; graph showing carlot shipments of apples, 1923, p.10; map showing carlot unloads, 1923, p.11; table showing monthly shipments of apples in principal producing states, 1919 and 1923, p.66; table showing carlot unloads, 1923, in 27 consumption centers, by states of origin, p. 72; comparison of U. S. exports of apples (fresh), 1919 and 1923, by main importers, p.85; exports by customs districts, 1923, p.87.

"The author presents data furnished by W. A. Crandall relative to a 21-acre orchard, containing about 625 trees ranging in age from 35 to 40 years, which was sprayed in 1913 and 1914 and dusted in 1915. Records of the cost of spraying in 1913 and 1914 and of dust-
ing in 1915 presented in tabular form show the spraying to cost about one-half more than dusting."-Exp. Sta. Record, v.36, p.54-55.
Not examined.

This bulletin was reprinted and issued as a thesis (Ph.D.) of Cornell University.
"The third of a series of orchard surveys being made of the apple growing counties of New York... is here reported. The work in Niagara County was carried on by a number of inspectors in 1905 and 1906 and completed by the author in 1907."-Exp. Sta. Record, v.23, p.538.
The first few pages of the bulletin include an introductory statement of the survey, historical notes, descriptions of valuable fruits originating in Niagara County and a discussion of the outlook for the industry.
Tables in the bulletin give statistics relative to periods of plantings; age of trees and yield per acre; relation of yield to soil types; drainage; fertilizers used, relation of fertilizers and methods of sod treatment to yield; enemies of the apple; spraying and yield and income; pruning; number of trees per acre; number of orchards rented and number worked by owner; years of tenure; approximate total yield in bushels for entire county for the years 1889, 1899, 1902-1906, inclusive; average yield per acre and per tree for the years 1902-1906, inclusive; classification of yields for the years, 1902-1906, inclusive; average price per barrel, per bushel, and per 100 lbs. sold to dry, paid to grower for the years 1902-1906, inclusive - price per 100 lbs. for cider given for 1905 and 1906; disposal of the crop, and average gross income per acre, and classification of incomes for the years 1902-1906, inclusive.

The bulletin is concerned with three phases of the subject - apple storage practice in Vermont, studies in apple storage on a small scale, and structural characters in relation to storage.

131. Cummings, M. B. The rise of commercial apple orchards in Vermont. (In Vermonter, v.26, no.1, 1921, p.2-14)
"A popular depiction of the recent rapid growth and improvement in commercial apple production in Vermont. Statistical data, presented in tabular form, relative to plantings since 1912, include one single enterprise of 5,500 acres."-Exp. Sta. Record, v.45, p.641.
Not examined.

"This is a popular bulletin... relative to apple growing in Vermont. The apple districts of the State are described and con-
sideration is given to varieties, planting operations, pruning, tillage, cover crops, orchard enemies, orchard renovation, educational factors, and the future of the industry."-Exp. Sta. Record, v.26, p.541.

Not examined.


"This bulletin displays the data for the first 20 years of a variety orchard where 40 sorts have been under study for 15 years and 33 varieties for 20 years."-p.3.

Tables II and III give comparative yields of apple varieties (average per tree) for a certain number of years and a summary of yields of apple varieties at end of first 20-year period.


"The authors give a short account of apple storage practice in Vermont and briefly review previous investigations dealing with the cold storage of apples."-Exp. Sta. Record, v.33, p.340.


The author discusses climate, soil, market, transportation, advertising, labor and fungous and insect pests.

Production, dates of last killing frost and blooming dates of Iowa apples are given for the years 1898-1911, inclusive.


"Cost of a young orchard": p.204-205. This is an estimate published by the Berkeley County Horticultural Society.


"Literature cited": p.78-81.

"The purpose of this bulletin is to present the results of the investigations (1) by outlining and describing the pomological regions of the area and (2) by presenting the information obtained regarding the behavior of fruit varieties in those regions."-p.1-2.

The following statistics relative to apples are given: number of trees of bearing and non-bearing age in 1920 and 1910 and yield in preceding season, West Virginia, Kentucky, and Tennessee (Census figures); carload shipments of apples from stations in Kentucky, Tennessee, and West Virginia in 1920 and 1921; and yield and income of apple orchards on different types of soil in West Virginia.
   The following statistical data are given for apples: Non-bearing and bearing apple trees by counties, 1910 and 1920; map showing distribution of trees by towns; and production of apples (total and commercial crop) for the state, 1915-1921, inclusive.
   Varieties of fruit adapted to Connecticut, for commercial planting and for the home orchard: p.11-14.

139. Davis, V. H. Apple grades. (In Ohio state horticultural soc. Annual rept. 51st, 1918, p.70-72) 81 Oh3
   Presents "the grade specifications suggested by the Federal Bureau, and also our suggested rules and regulations for enforcing these grades in Ohio."-p.70.

140. Davis, V. H. The cost of building an orchard. (In Ohio state horticultural soc. Annual rept. 50th, 1917, p.108-114) 81 Oh3
   "The author purchased a 145-acre farm and commenced to convert it into an orchard property in 1906. Annual cost data are given for all operations the first ten years, during which time 95 acres were planted to orchard and 25 acres were ready to be planted."-Exp. Sta. Record, v.41, p.835.

   The number of apple trees, total production of apples for the state and production of apples in Wayne, Fairfield, and Washington Counties, for 1900, are given on p.103.


   "A popular bulletin containing the 1910 census statistics of apple production for the United States, information relative to varieties adapted for Delaware, and brief cultural directions."-Exp. Sta. Record, v.31, p.236.
   There is also a table giving shipments of apples over the Delaware railroad, for the years 1908-1913, inclusive.

   "Based upon a study which was made during the summer and fall of 1925 relative to the marketing of farm produce at the roadside."
   Tables 11-14 list average prices of fruits and vegetables at permanent and temporary roadside markets and stands in Hartford, Anne Arundel, and Frederick counties, 1925. Apples are included.
145. Dickens, Albert. Some of the factors that determine whether apples should be packed or sold in bulk. (In Nebr. state horticultural soc. Rept. 49th, 1918, p.94-113) 81 N27


Following a description of material presented in the Circular definitions of "commercial crop" of apples and "commercial acreage" of truck crops, the distribution of New Jersey's fruits and vegetables is considered. The "Postface" contains discussions of trends and demands and some aspects of the economics of marketing.

The circular contains numerous tables and charts. The following pertain to apples: estimated receipts of certain crops (including apples) by truck and by rail, and total amount received from New Jersey in Philadelphia (p.14); chart showing trends of commercial production, 1916-1924, and total production, 1910-1924 (p.20); approximate shipping seasons for apples, by states (p.21, chart V); total and monthly carlot shipments of apples from certain states and the United States (p.23); domestic exports of apples from the United States for the years ending June 30, 1913/14-1917/18 (p.24).

There is a mimeographed statistical supplement to this circular. Pages 2-6 of this contain tables on apples, which give data on production, shipments, and receipts.


"The investigations reported deal with determinations of the freezing points of many of the important commercially grown varieties of apples, with a study of undercooling and its relation to injury, and a determination of the effect of freezing on the bruising of the fruit, visual injury, keeping quality in storage, etc."-Exp. Sta. Record, v.52, p.652.


Table III, p.18: Distribution of crop (including apples and peaches) area on 31 rolling and hilly farms and 48 valley and level upland farms, Ozark region, Missouri.

Table IV, p.19, shows among other data, value of sales of apples per farm on rolling and hilly, and valley and level-upland farms.


Pages 42-51 consist of analyses of the business of 10 individual farms. Acreage in apples, value of apples sold and production of apples are given for several of the farms.
   Discusses topographical, meteorological, etc., features of this area, botanical and entomological aspects, with especial regard to apple culture; gives a list of varieties; discusses markets, transportation and freight rates; gives a list of owners of apple orchards in Allegeny County, with short reports as to number of trees, age of trees, etc., and includes a table from the 1909 Official Inspection of Fruit Trees in Allegeny County.

   "A general discussion of this subject, with the estimated cost of establishing and maintaining peach, apple, and prune orchards and vineyards in different parts of Oregon, and a discussion of markets."—Exp. Sta. Record, v.17, p.463.

   "List of states which have standardized various types of fruit and vegetable containers with title and address of enforcing official."—p.17-18.

152. Drinkard, A. W., jr. The present status of varieties in commercial orchards. (In Va. state horticultural rept. 16th, 1911, p.110-120) 81 V81
   A brief summary of the results of a "questionnaire" study of apple orcharding in Virginia. Accompanied by two tables showing the relative rank of varieties in commercial orchards and a comparison of leading varieties in bearing orchards, young orchards, and prospective orchards.

   Total cost, and cost per acre, of producing apples on the orchards of Clement & Taylor, Winthrop, Maine, 1916: p.40.
   "Apple packing and grading laws": p.44-46.

   The purposes of this bulletin are to answer as far as possible questions concerning the benefits, forms of organization, causes of failure and success, of cooperative marketing associations in Washington. Pages 65-83 deal primarily with apple marketing organizations.
   The number of cars of apples shipped by various organizations
during seasons of 1923/24 and 1924/25, and the number of bushels produced, number of carload shipments, and value of apple crop in Washington for the seasons 1922/23 and 1923/24 are given.

155. Dunlap, H. M. Apple crop from tree to storage. (In Ill. state horticultural soc. Trans. new series, v.55, 1921, p.110-117) 81 I16

156. Dunlap, H. M. Best method in marketing the apple crop. (In American apple growers' congress.. Trans. 4th, 1906, p.71-78) 81 Am34

   Discussion: p.54-55.
   The author treats his subject from the standpoint of commercial orcharding.

   The writer discusses supply and demand, the modern home as a factor in low consumption of fruit per capita, the high cost of distribution, the retail system, the lack of proper distribution, standardization, and the fruit beverage problem.
   There are two tables which show the average annual production and the average production per capita of apples, peaches, pears, grapes, strawberries, lemons, oranges, and grapefruit, and the exports of raisins, dried and fresh apples, dried apricots, prunes, oranges, grapefruit, and canned fruits for the years ending June 30, 1923 and 1924.

   In discussing the wholesale and retail selling of apples the author gives his own experience.
   Discussion: p.56-59.


   Discusses picking, grading, packing, labeling, standards, markets, advantages of a large enterprise and an association, transportation facilities, freight rates, prices, profits, and the permanency of the commercial apple industry.

An orchard of 48 apple trees was set out on the Experiment Station farm at Wooster in the spring of 1915. Records of tree growth, yield of fruit, and cost accounts were kept. Costs of starting and maintaining the orchard, cover-crop section and grass-mulch section, are tabulated for the years, 1915-1924. Average production per tree for the 10-year period is given also.


"Apple and peach rots in storage. Sulphur fumigation. The effect of cold storage on the development of the diseases of apples and peaches. Inoculation experiments; blue mold only, developed and caused decay while held in storage for 2 months at 32 degrees." -J.S. Dept. Agr. Library. Bibliographical Contributions, no.4.


This consists of a description of an apple rot which was found to follow the apple scab and a core decay of Baldwin apples.


"Discussion of experimental results concerning the relation between the handling of fruit, the operation of the storage and the behavior of the fruit in storage. Covers many points in The Apple in Cold Storage by G. Harold Powell." -U. S. Dept. Agr. Library. Bibliographical Contributions, no.4, p. 3. Investigations cover the years 1906/07-1907/08.


"This circular comprises a brief discussion relative to the adaptability of New Jersey for apple culture, with special reference to favorable climatic and soil conditions. A general list of varieties adapted for commercial planting in the State is also given." -Exp. Sta. Record, v.30, p.739.


Contains miscellaneous information, collected from various sources, such as a comparison of orchard conditions in western Missouri orchards, future of the apple industry, apple orchard profits (this includes cost figures from individual orchardists), and a descriptive account of the Federal orchards in Macon County, Missouri.

Attached to this brochure is a reprint of an article from The Fruit Grower entitled Growing Big Red Apples in Missouri, by E. H. Favor.
"An account of apple culture in the different sections of California, with descriptions of varieties which give the best results in different sections."-Exp. Sta. Record, v. 16, p. 1079.

The writer reports on the results of three weeks' work in Doniphan county, Kans., where he made records in "several orchards of the per cent of apples that went into the various U. S. standard grades and to account for the variations in this, if possible, by studying the orchard practices used."

171. Filley, H. C. From car door to consumer. Lincoln, 1918. 20p. (Nebr. Agr. Exp. Sta. Circ.5)
This Circular is the result of "cooperative investigation by the University of Nebraska and Bureau of Markets of the United States Department of Agriculture."
"The author points out that the delivery of merchandise from freight car direct to purchaser has been a common practice for many years. He discusses the extent of the use of this method of distribution particularly as applied to apples, its cost, and its effect upon the price received by the producer as well as by the consumer. He concludes that the box car peddler has been a popular means of marketing apples, potatoes, and other products, and that, unless the public is to suffer, his function must be filled by consumers' and other organizations. He also recommends the cooperation of dealers as well as purchasers in ordering by carload quantities."-Exp. Sta. Record, v.39, p. 90.

Four tables deal particularly with apples. Table 1, p. 6, is The Cost of Direct Marketing; table 2, p. 7, is The Cost of "Regular" Marketing Including Cold Storage; table 3, p. 10, is Effect of Market Limitation; and table 4, p. 13, is The Economy of Car-Lot Buying. There is also a chart on p.12 which illustrates the statement that "The consumption of apples decreases as the price increases."

"This is a nontechnical discussion of causes of injury to apples in storage, including defects in handling, packing, and shipping; diseases, both parasitic and nonparasitic; and measures to prevent injury in orchard, transit, and storage."-Exp. Sta. Record, v.44, 1921, p.749.

"The survey included all orchards of commercial size in Ravalli County and extended as far down the Bitter Root river, into Missouli County as Lo Lo."-p.68.
Some statistics relative to the extent of the industry are given
in the text. Production and value for the years 1903-1906, inclusive, average yield per acre, and statistics relative to by-products for the same years, are given in tabular form.

Reports on varieties, the crab apple industry, pruning, fertilization, picking and packing, etc., and the rules adopted by the Hood River Apple Growers' Union are also included.


"Recent Federal publications on marketing, transportation and storage of apples": p.99.

The various steps and methods used in harvesting, inspection, transportation, grading, cooperative marketing, etc., of barreled apples are described. Features of the leading city markets, market preferences, variety and price, cold storage holdings, by-products, and the foreign trade, etc. are discussed.

Contains a number of charts, also 22 statistical tables which contain the following information: total production of apples in U. S. A. by 6-year averages, 1894-1923; estimated total production in barreled-apple region by states for years 1918-1923, inclusive; carlot shipments from barreled-apple region by principal sources, 1918/19-1923/24, inclusive (also given by months); annual carlot unloads of apples from barreled-apple region at 12 cities by principal states of origin, 1918-1923; carlot unloads from barreled-apple region at 26 cities by states of origin June 1, 1923 - May 31, 1924; cold-storage holdings, monthly, Oct. 1918 - June 1, 1924 (also given by states, average 1920-1923); disposition of the crop; prices of different kinds of apples in principal consuming centers, monthly, 1918/19-1924/25, inclusive; prices per barrel in British markets by varieties, weekly, seasons 1922/23 and 1923/24; and exports of apples by countries, 1918-1923, inclusive (year beginning July 1) and monthly July 1, 1918 - June, 1923.


"Recent Federal publications on the marketing, transportation, and storage of boxed apples": p. 94-95.

Numerous tables on pages 77-94 give statistical information regarding features of the western boxed-apple region; general methods of disposal by growers, production, carlot shipments, unloads, cold storage holdings, market characteristics of boxed-apple varieties, prices, exports, and features of boxed-apple export trade. 1918-1923 are the principal years covered.

176. Fletcher, S. W. Apple "booms" past and present. (In N. J. state horticultural soc. Proc. 45th, 1919, p. 128-130) 81 N42


"A popular discussion of the fruit zones of Washington with suggestions regarding the locating of orchards."-Exp. Sta. Record, v.14, p.439
Bulletin 52, Planting Orchards in Washington, by the same author discusses "those problems in the planting of orchards which arise after a location has been selected."


"The data included herein are the result of... [an] investigation" begun in 1917 "which included a survey of every important apple-producing county in the United States." On page 378 there is a table giving estimated annual production of commercial apples by states, 1916, 1917, and 1918, and by regions, 1917 and 1918.

There is also an article, by Mr. Folger, with the same title as the above in Pure Products, v.15, no.8, 1919, p.380-386.


Partial contents: Chapter I. Importance and history of the apple industry. - Chapter III. Commercial apple production in Canada, Australia and New Zealand. - Chapter V. The farm management phase of apple-growing. - Chapter XIV. Handling the crop. - Chapter XV. Marketing and storage. - Chapter XVIII. Cost of production.

Table III. - Average production of the leading apple districts of the West, 1916-1919: p.79.
Table IV. - Apple exports from Canada, 1909-1919: p.86.
Table V. - Production and exports of apples in Nova Scotia, 1911-1919: p.87.
Table VI. - Production of apples in British Columbia, 1911-1916: p.92-93.
Table VII. - Exports to Australia and New Zealand from British Columbia, 1913-1917: p.94.
Table XI. - Rate and cost of applying spray materials in six of the leading apple regions: p.229.
Table XIV. - Average annual yield on the bearing commercial orchards of western New York: p.343.
Table XVI. - Relation of yield to total annual cost of production: p.362.
Table XVII. - Effect of size of orchard on cost of a box: p.365.
Table XXVI. - Total cost of production an acre and a bushel in some of the leading apple regions: p.384.

180. Fraser, Samuel. American fruits; their propagation, cultivation, harvesting and distribution. N. Y., Orange Judd publishing company, Inc.; London, Kegan Paul, Trench, Trübner & co., ltd., 1924. 888 p. 93F86

Part I. Pome fruits with particular regard to the apple, p.9-369. Chapters noted are Picking and packing the apple; Sizing machines and grading; The box pack; Storage; Transportation; Marketing; Exports and imports; Dried fruits; Apple costs, yields and prices. (Some statistics are given.)

Part XII. Variety descriptions, p.795-870. (Apples, p.797-816;
Crabapples, p. 816-818


The purpose of this bulletin is to present in tabulated form information on carload shipments of all kinds of fresh or dried fruits and vegetables collected by a system of mail reports instituted in the spring of 1916. "It is designed to give shipping information only. It does not purport to give all the points or areas of production or to represent their relative importance."

Statistics for apples are found on pages 6, 7, 51-70.


Illustrated. Apples are included.

183. Fruit growers' conference. The apple annual, being the papers, discussions and proceedings of the Fruit growers' conference. Joint commission on fruit marketing of the states of Washington, Oregon and Idaho, and the Washington state grade and pack conference. Spokane, National apple show [1916]. 67 p. 81F942

Contains numerous articles on apples, which deal with such subjects as packing, picking, varieties, grading, etc.


Subjects under discussion are: The root stock problem, transplanting experiments and tree identification; Fruit pollination and proper grafting methods; Apple pruning symposium; Peach pruning symposium; Apple and peach fertilization; Orchard soil management; Apple pests and their control; Peach pests and spraying equipment; Picking, handling and storage problems (This consists of the following papers with discussion: New methods of determining the proper time for picking the different varieties and its importance in affecting the keeping qualities in storage, by Dr. J. B. Magnis. - Practical methods of controlling apple scald and water core. The use and value of shredded oil paper, by C. D. Brooks. - Factors affecting the keeping of fruit in cold storage, by W. P. Robinson; Packing houses and equipment (This consists of the following papers with discussion: Building and equipping a fruit packing house, by G. L. S. Carpenter. - Different types of fruit packages, by R. A. Spillman); and Symposium on orchard economics which consists of the following papers with discussion: The cost of growing a barrel or box of apples as reported by different investigators, by W. E. Whitehouse. - The price of different vari-
etries of apples on different markets, and the importance of red
bud sports and new cross bred fruits in commercial orchards, by Dr.
E. C. Auchter, and discussion of "What is a fair yield to expect of
apple and peach trees of different varieties and ages?"
The seventh section of the report is a "Summary of questionnaire
and general comments."

185. Fulton, B. B. Insect injuries in relation to apple grading. Geneva,
"Apple insects and their control," New York State Popular Bulle-
tin 475 was prepared from the above bulletin.
"In the practice of grading fruit according to the provisions of
the New York Apple Grading Law the attention of the fruit grower has
quite naturally been called to the great variety and diverse character
of the insect injuries appearing on the fruit at picking time. This
has led to an unusual number of demands on the station for informa-
tion in regard to the agents responsible for blemishes on the mature
apples. The orchardist can readily see the value of greater knowledge
on his part concerning the distinguishing marks of the various insect
injuries, which are, in many cases, quite characteristic and often
more conspicuous than the insect itself. It is the purpose of this
bulletin to make such identification as easy and rapid as possible,
and to show where there is danger of confusion of the causal agents."
- p. 5.

186. Funk, W. C., Waller, A. G., and others. Agricultural production and
marketing in Atlantic County, New Jersey. New Brunswick, 1925. 392
New Jersey agricultural experiment stations and the New Jersey
Agricultural Extension Service cooperating with the United States
Department of Agriculture, Bureau of Agricultural Economics.
This is a study of Atlantic County agriculture from the basis of
future development. The Atlantic City market is described as to its
population, industries, transportation facilities, markets, live
poultry market, stores, food consumption, etc. The agriculture of
the county is then discussed, with special regard to the present
status and prospects of peaches, sweet potatoes, berries, truck
crops, apples, grapes, poultry, etc.
Table 3 shows total 1924 receipts of important farm products
(apples, peaches, poultry, eggs, etc.) in Atlantic City, and quarter-
ly receipts by types of carriers hauling goods. Maps on pages 21,
24, 26, and 33 show peach, sweet potato and berry acreages, and num-
er of hens raised in county for 1924. Table 4 shows the estimated
acreage, production and disposition of crops (apples, peaches, corn,
and other fruits and vegetables) in Atlantic County, 1924.
The appendix consists of a list of varieties of fruits and vege-
tables recommended for Atlantic County.

(N. Mex. Agr. Exp. Sta. Bul. 73)
A map on p. 25 shows the most important apple-growing districts in
New Mexico.
Varieties adapted to New Mexico are reported on p.26-31.


"In this bulletin cost data secured in 1914 relative to the production of apples in nine different orchards are reported. The orchards selected represented differences in soil, variety, age, altitude, distance from the railroad, and other points. From the data secured as a whole it is estimated that under good orchard management it costs from $1 per barrel to produce apples when the production is 2 bbls, per tree up to $2 per barrel when the production is only .5 bbl. per tree."—Exp. Sta. Record, v.34, p.233-234.


To illustrate his article the author includes the following tables: Monthly sales of apples (bushels) by some of the leading wholesale houses in Detroit; monthly sales or consumption of apples (bushels) by retail stores or restaurants, and carlot shipments of Michigan apples, monthly, crop of 1919-1922, inclusive.

190. Gardner, V. R. The Ozark apple will hold its own; no other region can compete with this country in the production of cheap fruit when we get down to business; some interesting comparisons. (In Ozark Countryman, v.7, no.11, Jan.1, 1920, p.3-4) 6 Oz12

Discusses Missouri yields, production costs, and selling prices in comparison with northwest conditions.


"Adapted from a thesis submitted to the Graduate Committee of Michigan State College in partial fulfillment of the requirements for the degree of Master of Science."—p.3.

"The study on which this report is based was made for the purpose of answering these questions ... 1. How does the average apple grade out; i.e., what percentages are placed in each of the several grades? 2. What do culls cost the grower, or more accurately, how much is he penalized because his low grade fruit is not first class?"—p.3.


This is a small leaflet advertising the Georgia apple. It includes a short list which "shows when the more common varieties of Georgia apples are at their best" and another list showing the southern cities in which North Georgia apples are now stored.


Discussion: p.73-76.

On p.17-18 there is a list of varieties planted in 97 young apple orchards of Wisconsin, with the number of trees of each, grouped with reference to their localities.


The author advocates co-operation in fighting diseases and pests, and in packing and selling.

Discussion: p.152-159.


Discussion: p.55-59.


Report of investigations made by Bureau of Chemistry.


Records are for the Schmitkon orchards at Lorain, Ohio, the Stokes orchard, Fremont, Ohio, and the Starcher orchard in Gallia County, and contain information regarding spraying, marketing, and costs.

Yield and financial record of 25 acres of apple orchard for 10 years (1907-1916), and yield and financial record of 14 acres of apple orchard for 10 years (1908-1917) are tabulated on pages 158 and 178.


"The fundamental principles of apple growing are discussed in this bulletin ... The aim of this bulletin ... is to help the grower in meeting some of the problems of apple-orchard planting and maintenance."-p.II.

Table I. - Number of apple trees [ bearing and non-bearing ] in the United States by geographic divisions and States according to the Thirteenth and Fourteenth Census reports: p.2.


"Evaporators and appliances. The process of drying. Handling and storing the dried fruit."

Some idea of the range of prices at evaporators is suggested by a short table on page 3, which lists prices of white fruit per pound, chops per hundredweight, and waste per hundredweight, in New York, 1904, 1905, and 1906.

This bulletin which "is coordinate in character with Bulletin No. 135 of the Bureau series, entitled Orchard Fruits in the Piedmont and Blue Ridge Regions of Virginia and the South Atlantic States" contains a comprehensive index (p. 193) and 4 plates in addition to the text.

It includes a description of the Coastal Plain region with map, discussion of the development, status and present extent of the summer-apple industry of this region, growing, harvesting, grading and packing the fruit, packages, methods of selling, markets, and varieties. There are also phenological records and a descriptive list of varieties.

Records of temperature and precipitation for the years 1902-1907 inclusive are given for Kingston, N. C., Seaford, Del., and Moorestown, N. J. Average dates of the latest spring frosts at different localities in the Middle Atlantic States are given also. The number of bearing peach and apple trees is given for Kent County, Del. for 1890 and 1900 and number of bearing peach trees for Delaware and New Jersey for 1890 and 1900.


Contains 6 tables giving estimated average production of 35 of the most important varieties of apples, showing the percentage relation of each variety to the entire crop for 1909-1913, inclusive; estimated production of the 22 most important varieties of apples, showing the percentage relation of each to the entire crop, for 1915; estimated average annual production of 27 leading varieties, by principal States, 1909 to 1913, inclusive; estimated relative production of 33 principal varieties expressed as the percentages of a normal crop of all apples; estimated annual production of apples in the United States, 1890 to 1916, inclusive; and estimated production of early and of late varieties in the United States, 1915.

Illustrated also by maps and diagrams.


This bulletin is devoted principally to a discussion of the results of investigations begun in 1903 and contains a "somewhat comprehensive description of the region studied and an account of the conditions existing therein which have an important bearing on its fruit industry."

The number of apple and peach trees of bearing age in the Ozark region is tabulated on p. 7. Missouri and Arkansas figures are for 1890, 1900, and 1910. Oklahoma figures are for 1900 and 1910. Another table gives the number of apple and peach trees of bearing age in this region, by counties as shown by the Thirteenth Census.

204. Gourley, J. H. Notes on storing apples. (In Soc. for horticultural science. Proc. 9th, 1912, p. 41-44) 31 Sol2


Consists of quotations from statements of professional and commercial men regarding "conditions in the United States which pertain to the apple industry on a commercial scale."


A summary of the results of this survey made in the summers of 1911 and 1912 is to be found on p. 252 of the bulletin. An abstract of the bulletin was issued as Iowa. Agr. Exp. Sta. Circ. 20 with the title, Making Old Orchards Profitable.

The following statistical tables are given: Number of bearing and non-bearing trees, Apr. 15, 1910, and production and value of apples in each of 10 highest apple producing states, 1909; average annual production for period 1899-1910 for each of 16 states; number of bearing and non-bearing trees, Apr. 15, 1910, and production and value of apples, 1909, and per cent Iowa crop for each of 13 Iowa counties; number of bearing trees and production of apples, 1890, 1900, and 1910, and value of crop, 1870, 1880, 1890, 1900, and 1910 for the State and for Mills County (1860 value figures are given for Mills County); number of orchards by townships mentioned in a history of Mills County published 1881; number of commercial orchards and area planted in Mills County, for the years 1883-1911, inclusive; varieties grown in Mills County and varieties recommended by Mills County growers; methods of soil management in Mills County; yield in bushels, gross income and net income per acre under different methods of soil management and under different methods of pruning in Mills County, 1909 and 1911; how often 110 orchard men prune their trees in Mills County; number of sprayed orchards and type of sprayer used in each in 1911; gross income per acre from sprayed and unsprayed orchards, 1909; yield, gross and net incomes per acre in sprayed and unsprayed orchards, 1911; and detailed costs of harvesting and marketing apples per barrel.

There are a few statistics in the text. There are also accounts of the geology, physiography, and topography of the county and a description of the soil of the Missouri loess area.


"Results of freezing apples on the tree and in cold storage. Picking, packing, time of storage, culture, variety tests." — U. S. Dept. Agr. Library. Bibliographical Contributions, no. 4, p. 4.
209. Greene, Laurenz. Proper handling of frozen apples. (In Ind. horticultural Soc. Trans., 1917, p. 271-276) 81 In2
"Practical experiences show that freezing is not injurious if apples are allowed to thaw slowly. Discussion."—U. S. Dept. Agr. Library. Bibliographical Contributions, no. 4.


211. Hansen, H. F. A successful cold storage for apples. (In Minnesota Horticulturist, v. 44, no. 6, June, 1916, p. 243-244) 81 w66
This volume of the Minnesota Horticulturist is also issued by the Minnesota State Horticultural Society as Trees, Fruits and Flowers of Minnesota, v. 44, 1916.
"Directions are given for building a cold storage plant suitable for storing apples on the farm."—Exp. Sta. Record, v. 33, p. 447.

In cooperation with Extension Service, U. S. Dept. of agriculture.

"Literature cited": p. 32.
This report "is confined primarily to the results obtained in 1923 by the home station at Corvallis. Observations are confined to fruit grown and harvested under Willamette Valley conditions."—p. 5.

Gives "in detail the experiences of the author in handling thre aged and neglected apple orchards for a period of five years, together with a tabulation of costs and income."—p. 36.

"Miscellaneous crops": p. 23-24. Apples are reported on in this section.
Prices received for farm products and quantity of various farm products (including apples) available for sale on 25 farms, 1912-1916, annually: tables XI and XII, p. 45.

"The author here presents a complete financial history, including costs and returns, of a two-acre apple orchard. The total cost during a period of 30 years was $1,897.39 and the total net profit $1,356.01"—Exp. Sta. Record, v.35, p.447.


This bulletin is a preliminary report on one of two experiments conducted by the New York State Experiment Station.

On p.114 there is a detailed statement as to the expense and income from both plates for the years 1904-1908, inclusive, with figures for the total period.


"The author here presents data on the cost of various operations, yields, and selling prices for a period of ten years for an orchard in which the station has carried on a comparative test of sod mulch and tillage... The data, as far as possible, are given for three units, the barrel of apples, the tree, and the acre."—Exp. Sta. Record, v.31, p.48.


A continuation of the study commenced in 1904 and first published as Bulletin 376, Ten years' profits from an apple orchard.

The statistics are from the Auchter orchard near Rochester and include the following items: annual yield per acre and per tree of a total crop, barreled apples, and culls and drops, 1904-1923, inclusive, with ten-year averages; detailed costs per bbl., per tree, per acre, and total for 1904-1923, inclusive; and price received per barrel for apples (barreled; culls and drops) in the Auchter orchard for 1904-1923, inclusive, and 10-year averages.


Bibliographical footnotes.

There is also a 4-page popular edition of this bulletin entitled, So Fertilizers Pay in New York Apple Orchards?

"In summing up the results of 25 years' study of fertilizers in an experimental rose beauty orchard on the station grounds, the authors again... reach the conclusion that no form of fertilizer has had any significant effect on either the yield of fruit or the growth of the tree."—Exp. Sta. Record, v.53, p.448.

Bulletins 339 and 460 of this Station give results for the first seven and the first twenty years respectively.

222. Hetzel, H. C. Apple grading laws.—Their value and requirements. (In Ohio state horticultural soc. annual rept. 51st, 1918, p.66-70; also in Id. agr. soc. Rept. v.2, 1917, p.140-147) 31 Oh2; 4 4566

"A report on investigations conducted by the Bureau of Markets, U. S. Department of Agriculture, relative to the present status of apple-grading laws and practices in different States, with conclusions as to the value and requirements of apple-grading laws."—Exp. Sta. Record, v.41, p.835.


"As presented by H. C. Hetzel, Assistant in Market Grades and Standards, at the annual meeting of the New York State Fruit Growers' Association, held at Rochester, N.Y., on January 10, 1916, and which consists of a brief report of the investigations relating to apple grade legislation that were conducted by the Bureau of Markets during the years 1916 and 1917, together with the principal conclusions and results derived."

224. Hodson, E. A. Box-packing apples for market. Fayetteville, 1925. 16p. (Ark. Univ. Col. agr. Ext. serv. Ext. circ. 204) In addition to practical directions for packing, a "complete text of the Arkansas apple grades with definitions and tolerance" is included.

225. Holmes, E. S. Statistics on the fruit industry of California. Washington, 1901. 11p. (U. S. Dept. Agr. Div. of statistics, Bul.82, misc. series) Deals with the development of the industry, varieties grown, acreage and number of trees (by kinds of fruit, bearing and non-bearing, 1900, for the state; total number of bearing and non-bearing fruit trees, 1898, by counties) and transportation. The only statistics given for apples are the number of bearing and non-bearing trees and acreage in the state, 1900.


227. Hoyt, Edwin. The apple as a money crop, and how to get the most out of it. n.p. [1901?] 4 p. 93 H35

The author discusses various phases of the subject for Connecticut and New England farmers.
223. Hughes, J. L. Fruits- their handling and storage. (In Amer. soc. of refrigerating engineers. Trans., v.9, 1913, p.203-215) 295.9 Am32T

"Popular directions for harvesting and packing apples for shipment with apple growers' rules regarding the standard barrels and requirements for several grades of apples."-Exp. Sta. Record, v.17, p.865

"The investigation covered a four-year period, 1919 to 1920 inclusive. It included (1) a study of the agricultural development and readjustments of the Twin Falls south side project, (2) a business analysis of the farms studied during each of the years 1919-1922, (3) the cost of producing each of the seven primary crops grown in 1919, 1920, and 1921, and (4) the average cost of keeping work horses and the cost of horse labor per hour in 1921."-p.4.
Paragraph on commercial orchards: p.18.
Orchard and general crop farms: p.49-52. The tables included are all on orchard farms, but the text states that the orchards consisted mostly of apples.


232. Hutt, W. N. Construction and use of farm storage house for apples. (In Ind. horticultural soc. Trans. 1917, p.233-247) 81 In2

"This bulletin contains information with regard to the grading, packing, and marketing of a large variety of fruit (including apples) and truck crops, and is introduced by a discussion in regard to the value of standard packages, brands, and trade marks, and the relations of the railroads, commission men, and fruit dealers to the growers. Accounts are also given of the New York fruit exchange and a few types of cooperative fruit-shipping associations or exchanges. The text is accompanied by several figures illustrating various styles of fruit packages, etc."-Exp. Sta. Record, v.19, p.32.

235. Idaho, Dept. of agriculture. Official grades for the standardization of Idaho farm products, 1921 ... Boise [1921?] 48 p. 30.5 Idl The law governing apple grades is on the inside of the front cover.


237. Illinois first great apple show. 2d ed. [Chicago? 1918?] 64 p. 225A In addition to premium lists, rules for exhibits, etc. this booklet contains a list of "progressive apple growers of Illinois" with their addresses, acreage planted in orchards, and varieties grown.


239. International apple shippers' association. Estimate of the number of barrels of apples in storage in the United States, and Canada 1909-1912 with corresponding statement for same period of 1908-1911. Rochester, N. Y., 1909-1912. 295 In83 Data are given by states.

240. International apple shippers' association. Grade and standardization laws United States and Canada. Rochester, N.Y. [1924?] 206 p. (Special pamphlet 1923-1924) 280.3 In82 "Important laws relating to grades, marks, packing, packages, standards, and the Food and Drugs Act, together with opinions, decisions, special notes, departmental regulations, etc."


241. International apple shippers' association. [Important laws relating to grades, marks, packing, packages, standards, and the Food and drugs act, together with opinions, decisions, special notes, departmental regulations] Rochester, N. Y., 1918. 55p. (Special pamphlet 1918) 93 In83


Includes itemized statements of the "overhead charges" in spraying different orchards and a summary of cost per tree for spraying.


Information obtained by personal visits to growers in Franklin, Berkshire, Middlesex and Worcester Counties, and in the Newbury section, Mass., is presented here.

"The costs of marketing are considered as beginning with the cost of picking and including all actual expenditures until the fruit is in the hands of the first purchaser, whether he be buyer, wholesaler, retailer, or consumer ... The conclusions reached from this study are that sale to country buyers is the least profitable method of sale, that it pays the grower to grade his apples, and ... that sales on commission give the highest returns."—Exp. Sta. Record, v. 53, no. 5, October, 1923, p. 492.

Average prices, costs of marketing, and margins over costs of marketing are tabulated. p. 8.

Average or most common expenditures for the various items entering into costs of marketing are tabulated on p. 9.


"This monograph is part of the general study of the economic aspects of the New England apple industry undertaken by the Massachusetts Experiment Station. It was arranged in order to determine the competitive position of Massachusetts and New England apples in both domestic and foreign markets; to analyze the factors which limit the demand; and to determine, insofar as possible, the measures by which the market may be improved."—p. 2.

Pages 4-16 deal with the domestic market, pages 16-31, with the foreign market, and pages 31-38 deal with prices.

The bulletin contains 19 tables and 7 charts. Tables show the location and character of retail stores (1); stores reporting grades of trade (2); volume of commercial crop of New England, Massachusetts, New York, and Washington, 1916-1925 (3); carlot unloads in selected markets, by sources, 1925 (4); monthly carlot arrivals on Boston market from Massachusetts, other New England states, New York state, and Washington, 1920/21-1922/23 (5); carlot arrivals in Boston of apples and chief competing fruits, 1921-1925 (6); proportion of retailers purchasing from grower and wholesaler (7); percentage of retailers handling apples in each type of container (8); grades and sizes preferred by different types of retail trade (9); apple production in the chief producing countries, 1921-1924 (10); total apple exports and imports by chief countries, 1921-1925 (11 and 12); volume of apples exported from the United States 1901/02-1922/23 (13); commercial production in the United States, with percentage exported, 1913/19-1922/23 (14); Canadian exports of apples, 1920/01-1922/23 (15); British and German imports of apples (16); typical export charges, New York to Liverpool (17); preferences in
foreign markets (18); average monthly prices per barrel of no. 1 Baldwin apples (13).


This bulletin discusses apple production and orchard area, early history of orcharding in the county, orchard distribution and management, size and age of orchards, planting plans, varieties, soils, soil management, relation of soil management to yield and income, fertilizers, pruning, pests and diseases, spraying, yield, market, prices and incomes.

The bulletin is accompanied by statistical tables relative to the subjects mentioned above. Statistics are for 1913 for the most part. Table I gives number of apple trees and yield of apples from Census of 1890, 1900, and 1910 for 13 different states. Table XXIV gives general average yield and income per acre for trees 10 years old and over for 1910, 1911, and 1912.


"Reprinted from 'Orcharding', Massachusetts Agriculture series, no.2."

Discusses harvesting, market packages, sizers, barrel packing, apple box packing, box packing table, grading, lining the box, wrapping, packing, packing in bushel produce boxes, risers, and slats.


Discusses inspection, grades, standards, packages, and packing.


251. Judson, L. B. A few words relative to apple packing. (In Western N. Y. horticultural soc. Proc. 53d, 1908, p.71-77) 81 W52P


"Popular directions are given for the harvesting, picking, and marketing of apples, including an account of packing houses and fittings, and directions for organizing fruit growers into associations to secure better packs and higher prices. The appendix contains a circular of advice to growers and packers distributed among the members of the Hood River Apple Growers' Union, the text of the Canadian Fruit Marks Act of 1901, and the articles of incorporation and by-laws of the Hood River Fruit Growers' Union."—Exp. Sta. Record, v.18, p.145.

In tabular form are given the essential facts brought out by some investigations of the U. S. Dept. of Agriculture: Cost of tractor and horse power and cost of motor truck work; labor and material requirements for corn, cotton, corn silage, potatoes, sugar beets, tobacco, field beans, kaffir and milo, wheat, oats, barley, rye, hay, alfalfa, seed, apples; acre cost of production for these crops and for truck crops.


A short "study of the economy of storages," cost of a storage is among the factors discussed. There is also a table (from U. S. Dept. Agr. Yearbook) giving prices of apples on farms the first of the month for the years 1911/12-1919/20, inclusive, and average for the period.

255. Kansas state horticultural society. Apple ... what it is; how to grow it; its commercial and economic importance; how to utilize it. Topeka, 1898. 229 p. 93 K13a

Partial contents: Some apple producing states, p.9. (Gives production in certain states for 1889).-American apple abroad, p.10, 11, 12 (weekly exports and imports, Aug. 7, 1897 - June 11, 1898, and yearly exports and imports 1880/81-1897/98, inclusive).- The apple business, by J. C. Thompson, p.10, 11, 12, 13.- A short account of the wellhouse orchards, p.13-14.- Revised list of apples recommended for Kansas, p.14-15.- Description of varieties referred to in this book, p.15-42.- The state, by districts, with summary, p.42-130 (consists of a table giving number of bearing, non-bearing and total number of apple trees in Kansas by counties, 1897, and reports of experiences from orchardists in these counties).- Picking and packing, a picking pack, a discussion of packages, and cold storage, by George Richardson, p.196-197, 198-200.


Growing and marketing apples, by J. H, Rothenberger: p.56-59. The writer gives his experiences in this paper.

Horticultural statistics: p.224-248. These statistics contain the following information relative to apples: Number of apple trees of bearing and non-bearing age, for the state and each county for 1916 and 1917; production of apples for the state and each county, 1915 and 1916.


The following statistics are given for apples: number of bearing and non-bearing apple trees in the state and in each county.
for the years 1924 and 1925, and production of apples in the state
and in each county for the years 1923 and 1924.

258. Keil, J. B. Water-core of the King David apple. Wooster, 1916. (In
Results of storage tests with King David apples are tabulated.

of northwestern boxed apples. Washington, 1921. 27 p. (U. S.
Dept. Agr. Bul. 935)
Data cover estimated commercial production for the years 1916-
1920; Pacific Northwest earliet shipments of apples, 1919/20
season, by states, principal districts, and shipping stations;
primary destinations of cars shipped from the Pacific Northwest
during the 1919/20 season; apple exports by months 1915/17-1919/20;
and freight rates.

260. Knapp, H. B. Wholesale prices of apples and receipts of apples in
Cornell, Agr. Exp. Sta. Circ. 22)
"This comprises a statistical study of receipts and wholesale
prices of apples during the 20-year period 1893-1913. The receipts
are shown for each year and month. The average prices are given
by years and months and also the average prices of different vari-
eties of apples. A comparison is made of the rise in price with
the changes in price of other products."-Exp. Sta. Record, v.31,
p.47.

Another account of this study, entitled "Receipts and prices of
apples on the New York market" is found in the Proceedings of the
New York State Fruit Growers' Association, 1914, p.119-123.

Exp. Sta. Bul. 81)
"The author discusses the early history of apple growing in
Oregon, including an account of the rise and decline of early
planted orchards, and gives directions for planting and caring
for orchards in the State at the present time."-Exp. Sta. Record,
v.16, p.368.

Exp. Sta. Bul. 82)
This is part II of the series on the Apple in Oregon. It deals
with varieties, pollination, tillage, cover crops, and pruning.

Sta. Bul. 79, p.25-29)
A preliminary report on the problems of a biological nature
concerned in apple storage.

264. Large apple storage warehouse. (In Ice and Refrigeration, v.54, no.3,
Mar. 1918, p.154-156) 295.8 Ic2
"Description of a plant owned by the Winchester Cold Storage.
265. Lawrence, W. H. Apple growing ... written specially for use in the Pacific horticultural correspondence school, Portland, Oregon. (Orenco, Or., E. V. Heade, 1913) 31 p. 93 L43
"Gathering and storing the fruit": p. 29-31.

266. Lazenby, W. R. Judging or scoring fruits. (In Soc. for the promotion of agricultural science. Proc. 1893, p.156-161) 4 Sol
"A discussion of the ideal qualities of the apple for commercial purposes and scale of points for judging the fruit of the apple, grape, strawberry and tomato."—Exp. Sta. Record, v.11, p.252.
Not examined.

"This bulletin contains popular directions for harvesting, grading, packing, and marketing fruit, together with suggestions for the formation of cooperative associations. In an appendix by E. H. Shepard the various features of the Hood River apple growers' union are described, including the articles of incorporation and by-laws, together with advice and special directions to growers and packers. Extracts are also given from the Canadian fruit marks act of 1901. The text is well illustrated."—Exp. Sta. Record, v.19, p.38.


In addition to discussions on Oregon as a fruit state, overproduction, the choosing of an orchard, profits in orcharding, planting, pruning, etc., there are lists of varieties of fruits for various localities, a list of reliable works of interest to horticulturists, a list of papers and publications, and a list of Oregon fruit growers' associations.

Cost of producing strawberries, apples, pears, peaches, prunes, and grapes: p.45-46. Study conducted in 1907.

This second orchard survey published by the Oregon Experiment Station, covers the whole of Jackson County. The following su-
jects are discussed on p. 4-23: The development of commercial fruit growing in the country, site and aspect, soils, cultivation, fertilizers, irrigation, drainage, and planting of young trees.

Statistical information is given for the following: age, number and variety of apple, pear, peach, prune and plum, cherry, apricot, and almond trees; number and acreage of different kinds of fruit trees; yields of apples at different ages; condition of orchards; number of trees, acreage, average yield per acre, cost per box of producing, and total yield of apples, pears, peaches, and prunes; and average prices net per box of apples, pears, peaches, and prunes for years 1908-1907, inclusive.

Other subjects discussed are pruning, thinning, diseases, insects, condition of orchards, peach growing, yields, preparation of fruit for market, and selling.


“For the past four years the Division of Horticulture has been conducting investigations dealing with the cost of fruit production in the Pacific Northwest. The investigations have been conducted on a broad scale, including the states of Oregon, Washington, Idaho, and the Province of British Columbia, and have entailed the study of a thousand orchards... The aim of the bulletin is to give average costs of production which will serve as an aid to those orchardists attempting to lower their production costs, and which will indicate what expenses may be included under the various heads of Growing, Handling, Overhead and Selling.”—Summary, p. 3.

A popular summary of this bulletin is to be found in Nebraska Horticulture, v. 5, no. 19, 1915, p. 1-5, 7.


“This bulletin contains popular directions for growing the more important kinds of orchard fruits, including a discussion of the location and site, soil, drainage, methods of cultivation, use of cover crops and fertilizers, irrigation, pruning, thinning, spraying, pollination, etc. The state is divided into 5 horticultural districts, and lists are given of apples, pears, cherries, plums, prunes, peaches, grapes, strawberries, raspberries, blackberries, currants, and gooseberries adapted for planting in the several districts.”—Exp. Sta. Record, v. 19, p. 35.


Illustrations accompany this descriptive account.


“A fruit storage cellar capable of holding about 6,000 bu. of apples is here described and illustrated.” Exp. Sta. Record, v. 27, p. 644.


278. Lloyd, J. W. Storage problems for Illinois. (In Ill. state horticultural soc. Trans. new series, v.52, 1918, p.151-159) 81 I16 "I shall ... confine my remarks chiefly to some of the economic aspects of the storage problem."


280. Luedtke, C. L. The foreign trade of the United States in fruits with special reference to the export markets for apples. (In American pomological soc. Proc. 39th, 1922, p.172-186) 81 Am33 "The purpose of this report ... is merely to point out some of the peculiar characteristics of foreign markets and their special preferences, methods of sale, etc., and in general to summarize briefly some of the chief problems that must be solved by those who engage in the marketing of fruit for export."-Introduction.

281. Lupton, S. L. [Address on marketing apples] (In M. J. State horticultural soc. Proc. 40th, 1914, p.111-116) 81 M42 Senator Lupton discusses the present method of marketing apples and its results, suggestions for the correction of some of the evils of this method, and the best means of securing the adoption of such methods as are worth while.


The writer discusses various phases of the growing and marketing of apples in Virginia.

Harvesting, grading, packing, and marketing are briefly discussed on p.37-38.
A list of varieties suitable for certain sections of Georgia and a descriptive list of varieties are to be found on p.38-44.
This is a revision of Bulletin 134.

"The methods of harvesting, grading, packing, storing, transporting, and selling fruits and vegetables are described. Statistics are given of the imports of fresh, dried, and canned fruits, fresh and dried vegetables, and nuts. The types, operation, and significance of cooperative marketing agencies are discussed." - Exp. Sta. Record, v.55, p.785.
The following deal with apples: chart showing carlot shipments, 1920-1924 inclusive, p.264; table 2 showing the length of pooling period of 478 associations handling various commodities, p.667; chart showing apples in cold storage, Dec. 1898, 1899, and 1900, and from 1915 to 1925, inclusive, and table showing commercial apple crop, cold storage holdings, Dec. 1, and per cent of commercial apple crop in storage, Dec. 1, for the years 1919-1925, inclusive, p.631; tables of imports, 1922, 1923, 1924, and 1925, p.694-695, 698; tables of exports, 1922, 1923, 1924, and 1925, p.700, 701, 703.

The writer discusses color in apples, local climatic influences, and the originating of hardy varieties on p.41-49.

Not examined.

Discusses time of picking; care in handling; temperature and humidity of, and influence of ventilation on, apple storage, and the aroma of the fruit.

"It is the purpose of this paper ... to discuss only the relation of handling and storage of the fruit to its quality when it
reaches the hands of the consumer." Deals particularly with apples.


"Literature cited": p.36-38.

"A report upon studies of the changes occurring in apples as they approach maturity on the tree and during the storage period subsequent to harvesting." - Exp. Sta. Record, v.51, p.41.


"Literature cited": p.64.

In three parts. Part I, Studies of the ripening of apples. - part II. The ripening of apples in storage as influenced by temperature. - Part III, The handling of apples for storage.


Copy in Library, U. S. Bureau of Agricultural Economics.
The writer, at the time of writing this paper, was General Manager, Western Oregon Fruit Distributors, Sub-Central, North Pacific Fruit Distributors.


"General discussion of factors entering into successful marketing."—U. S. Dept. Agr. Library. Bibliographical Contributions, no.4, p.34.

300. Marble, L. M. Experiments with apples in common and cold storage. (In Ice and Refrigeration, v.67, no.3, Sept. 1924, p.156-161) 295,8 Ic2
"Results of experiments conducted at Marble Laboratory, Canton, Pa., and described in paper presented at Fourth International Congress of Refrigeration."


"A popular paper on the handling and storing of apples in which some of the results are given of storage investigations conducted by the U. S. Department of Agriculture."—Exp. Sta. Record, v.35, p.342.

"Based on studies conducted in several non-refrigerated apple storage houses, extended information is presented upon the construction, equipment, and operation of such structures, laying particular emphasis on the necessity of thorough insulation and provision for adequate ventilation."—Exp. Sta. Record, v.53, no.5,
The author discusses operation of the storage, insulation, etc.

"This comprises the results of a census of the commercial apple industry of Virginia, taken in 1918 under the direction of the extension division of the Virginia College. Tabular data are given showing the number of trees by counties and by important varieties. There are approximately 2,155,000 commercial apple trees of different ages in the State."-Exp. Sta. Record, v.40, p.149.
An article with the same title is in the 23d Report of the Virginia State Horticultural Society, 1918, p.114-125.

"A detailed description is given of an apple storage house which is said to have been a decided commercial success in Michigan for nine years. Detailed drawings are included."-Exp. Sta. Record, v.49, p.890.

"To what extent do factors associated with the ripening of apples indicate the stage of maturity?"

"The bulletin, presenting a graphic picture of conditions and results attending apple growing in Ontario County, is the fourth of the series devoted to the findings of surveys of important apple-producing counties in New York State. The appendix contains a brief discussion of some of the principles underlying statistical methods."-Preface.
"The material is arranged from two standpoints: 1. The general distribution of orchards according to the different factors enumerated in the survey. 2. The relation of the different methods in orchard management to yield and income."-P.170.
Issued also as Thesis (Ph. D.) - Cornell University.

"A popular treatise on the subject, including illustrated descriptions of various types of grading and sizing machinery."-Exp. Sta.
Record, v. 36, p. 742.

311. Mason, R. P. Cold storage for apples. (In American Cultivator, v. 57, no. 46, Nov. 16, 1893, p. 1)
   A brief article giving the proper temperatures.

   A brief discussion of the subject.

   Contains ten papers summarizing "the more practical aspects of the experimental work of the Station that is of interest to fruit growers."

Partial contents: The apple situation, by Lorien P. Jefferson and Hubert W. Yount. — The value for Massachusetts of some of the newer varieties of apples, by J. K. Shaw.
   Other papers deal with diseases, pests, pruning, spraying, etc.

   2 M33R


   "Eighteen pertinent facts relative to marketing Massachusetts apples are summarized in the conclusion on p. 11."

   Bibliography: p. 168.
   Revised by W. A. Munson.

"A review of the deal ... confines itself practically wholly to the Massachusetts crop, grown mostly in the so-called 'Homegrown' area in the eastern part of the state, principally Middlesex County." -p.1.


By W. E. Piper, Jr.


Figures for all commodities, except potatoes were compiled from the daily Farmers' Produce Report issued by the Division of Markets, Mass. Dept. of Agriculture, in cooperation with the Boston Market Gardeners' Association. Prices and index numbers are both given.


Contains bibliographies.

Copy in Library, U. S. Dept. of agriculture.


This section contains numerous charts and 3 tables. The tables contain the following data: number of trees 1900, number of both bearing and non-bearing trees, 1910 and 1920 for Massachusetts, New England, United States, New York, southern district, and all other barrel states and box states; production of apples by producing areas, 1900, 1910 and 1920; estimated annual production of apples in Massachusetts, 1899 to 1922, inclusive; annual commercial and total apple crop, 1916-1922, by producing areas; apples in cold storage in Boston, weekly, Oct. 7, 1922, to Apr. 28, 1923; comparison of Boston cold storage holdings of eastern box apples with prices paid grower for Massachusetts Baldwins, weekly Oct. 7, 1922- Apr. 28, 1923; Boston apple receipts in carlots by months, 1920, 1921, 1922; percentage of total apple supplies furnished Boston market by Massachusetts growers monthly, 1920, 1921, 1922, and per cent of total Boston apple receipts shipped in by commercial growing sections, 1920, 1921, and 1922.


Discussion: p.184-186.

"The prices of the leading varieties of apples have been tabulated as given by the 'Chicago Packer.'" Prices are given weekly, for the most part; for the years 1912-1915 for Cincinnati, 1911 for Indianapolis, 1911-1915 for Chicago, 1913 and 1914 for New York.


"This book outlines the methods of marketing boxed apples and includes discussions of problems of intensive production, grading and standardization, rail transportation, sales in distant markets, and large scale assembly and cold storage." - Exp. Sta. Record, v. 50, p. 333.

The book contains an index.

In addition to a few statistics taken from Census and Dept. of agriculture publications there is given on p. 20 a detailed statement of expense of the packing house of the Cashmere Fruit Growers Union, Cashmere, Wash., 1920.


"The information for this survey was collected during the fall of 1925 and the summer of 1926 for the crop year of 1924 ... an attempt was made to include only commercial orchards." p. 150.

Phases of the apple industry discussed in this bulletin are: commercial apple areas of Maine; number, age, and condition of trees; principal varieties; size of bearing orchards; orchard practices, marketing the crop; production of the principal varieties; grading, storage, and methods of sale; prices received in 1924; and money receipts from apples. There are 24 statistical tables.

325. Michigan. Laws, statutes, etc. Laws relating to orchards and vineyards, comp. under the supervision of Coleman C. Vaughan, Secretary of state. 1917. Lansing, Wynkoop Hallenbeck Crawford co., state printers, 1917. 26p. 464.5 M58

"Fixing standards for apples ... and regulating the packing and sale of such apples." p. 22-24.


Discussion: p. 95-97.


Detailed information is presented as to the time required to perform each operation, the necessary equipment, the size of the orchard, the age of the trees, yield of fruit, and other related factors.
Cost per acre, per tree, per barrel, 1911 and 1912, in the Wellman apple orchard, Orleans County, New York.

"A detailed study, made in 1914, of the current cost factors involved in the maintenance of orchards and the handling of the crop on 87 orchards."

Study made in 1915. Data include cost of labor, total investment, insurance, taxes, etc. The acre is the unit used.

Not examined.

332. Mobley, R. H., and Livesey, J. E. "Apple storage" - The care of apples prior to and immediately after harvest. (In Refrigerating World, v.52, no.1, Jan 1917, p.31-33) 295.8 C67


"A contribution from the Bureau of Markets relative to the present status of the fruit industry in China and the possible development of markets for certain American fruits in that country."-Exp. Sta. Record, v.44, p.640.
Official quotations of the public market, Shanghai, No.26, 1917, are given in terms of both Mexican and United States currency for apples, etc.-p.5.
Exports of dried apples, etc., from United States to China proper and Hongkong, 1906-1918, are tabulated. -p.26-27.

"This bulletin presents the results of studies concerning certain phases of apple marketing and distribution which were conducted during the season of 1914-15.

"The subject matter treats of the following phases: Conditions preceding the movement of the crop; effect of the war upon export prospects; effect of the war upon the home markets; conditions in the New York State orchard district; tracing distribution; retail methods and costs; market preferences for varieties; grades - boxed, barreled, bulk; the effect of inferior apples upon the market; shipments under ventilation and refrigeration; grade and package laws; cold storage holdings and movement; Pacific Northwest apples via the Panama Canal; and markets in the United Kingdom, Europe, and South America.

"Charts showing the total receipts of apples in St. Paul and New York City during selected periods, together with charts showing total receipts and wholesale prices of certain varieties in New York City during the 1909-10 season are appended."-Exp. Sta. Record, v.34, p.149.


The following statistics are given for apples: production in Australia (average of 1914-1917); exports from Australia (average for 1912 and 1913); exports from New Zealand (average for 1912 and 1913). Another table gives marketing seasons of home-grown fruits in Australasia.


Not examined.


"In this bulletin all of the available crop requirement data assembled by the United States Department of Agriculture are summarized. . . . Labor and material requirements per acre are reported in this bulletin for the following crops: Corn, corn silage, cotton, wheat, oats, barley, rye, grain sorghums, field beans, potatoes, sugar beets, tobacco, apples, and hay, and a few miscellaneous field crops."

Supersedes "Preliminary report."

Apples: p.46-49.


Bibliography: p.44.

"Following a brief discussion of the pressure tester and its development as a means of determining the maturity of deciduous
fruits, the author reports upon the results of miscellaneous studies in factors affecting the storage life of apples." - Exp. Sta. Record, v. 54, p. 338.


"Report of data submitted for economic conference" on horticulture.

Part 1 is General situation and status of the industry. - Part 2 is Some factors in the apple industry which determine the future.

There are numerous tables which give data on number of trees, production, per capita production in western states by periods, 1889-1924, average annual per acre yield, prices, shipments, cold storage holdings, sources of apple supply in several cities, canned apple pack, freight rates, etc. There are also charts and maps. Data are for Washington with comparative statistics for United States and other states.


Tables 3-5 contain data relative to quantity and grade of fruit as produced by crowded and open stands.


"The author conducted experiments for two seasons with the view of determining the rapidity with which apples change in composition when stored at different temperatures, the rate being measured by determining the amount of carbon dioxide given off by the fruit at different temperatures." - Exp. Sta. Record, v. 19, p. 1143.

The Journal of the American Chemical Society, v. 30, no. 5, 1908, p. 876-881, contains a more technical account of these investigations. The title is The Effect of Temperature on the Respiration of the Apple.


"This bulletin contains a report of progress upon orchard experiments in Kennebec county, including culture and fertilization, orchard renovation, top-grafting, and cover crops; and notes upon pruning orchards."


"Literature cited": p. 33.

"The object of these experiments was to ascertain standards which
would aid in determining when apples should be harvested in order to have the best market quality after a period of storage." - p.5.


Also printed in its Report, 1917-18, v.35.

"Practical application of the New Hampshire apple grading and packing law": p.21-25.


In addition to the text of the law this pamphlet contains a discussion of what the law is expected to accomplish, precedents for, and advantages and requirements of the law, and the text of the United States Apple Grading and Packing Law.


Contains, on p.189-191, a report on a study of the economic situation of the fruit industry, with plates. Plates 6-10 are charts which show average number of bearing apple trees, total annual crop and largest single annual crop by 5-year periods, 1889-1922, inclusive; (1919-1922, 4-yr. period); average production of apples per tree, per capita, and New York wholesale price per barrel, 1889-1922, inclusive; bearing and non-bearing apple trees by sections, 1910, 1920 censuses; per cent of commercial production, by geographical sections, 1915-1922, inclusive; New Jersey's apple crop, 1869-1922, inclusive; trees, 1908-1919.


Contains information relative to the acreage planted to apples and to other fruits, average acreage of all fruits by counties, character of soils devoted to fruit growing, kinds and varieties of fruit grown, and answers received as to questions on methods of preparing fruit for market, selling, and whether fruit growing pays.


On page 168 there is a table showing a comparison of the fruit pack in 1912 with that of 1911. The pack of apples is given for 1911.


There is an index to each part of this bulletin, but only part I contains information on the apple. On p.968-970 there is a table taken from the Census of 1910 which shows the number of trees and
the production of apples in New York State by counties.

Contents of part I relative to the economic aspects of the apple industry. The apple grading law, by H. P. Van Raren. - The apple packing teams, by E. S. Welsh. - Introduction of the apple into America, and into New York State, by Charles S. Wilson. - The apples of New York, by S. A. Beach. - Intercropping the young orchard - from an economic standpoint, by M. C. Merritt. - The profit on a barrel of apples by U. P. Hedrick. - Central packing houses for New York fruit, by E. S. Welsh. - Selling on commission and buying direct from producers, by J. H. Killough. - Exporting apples, by O. W. Kimbell. - Auction houses as distributors of fruits and vegetables, by Victor F. McElhenny, jr. - The evaporated fruit industry in New York State, by E. W. Catchpole. - Receipts and prices of apples in New York City and exports of apples from the United States and Canada, by H. P. Knapp.


Discusses the agricultural law in relation to apples and the New York State apple grading law. A copy of the United States apple grading law is included.

353. New York (State), Dept. of agriculture. Suggestions as to the picking and packing of fruit for the foreign and home markets. [1896?] 9 p. 9 X 6 Pam. Coll.

According to the preface this paper was prepared by Mr. George T. Powell.


This bulletin is a revision of Bulletin 79.

Index: p. 333-344.

Partial contents: The fruit district of New York, by U. P. Hedrick. - The apple grading law, by B. L. Van Puren. - The apples of New York, by S. A. Beach. - Intercropping the orchard - from an economic standpoint, by M. C. Merritt. - The profit on a barrel of apples, by U. P. Hedrick. - Prices of apples and pears on the New York City market from 1853 to 1917, by O. W. Park. - The evaporated fruit industry in New York State, by E. W. Catchpole.

Statistics of apples are found on p. 145-147. They include estimated production for New York and the United States for the years 1911-1922, inclusive, and the number of trees and production of apples in New York State by counties for 1920 (i.e., 1919).


Pages 3-36 deal with the law and pages 7-13 with the application.
of the law and interpretation of terms.

A brief account of the accomplishments of this campaign.

Not examined.


Contents: Apples in North Carolina, p.4-17. (This includes a descriptive list of varieties and a list of varieties suitable for the different regions). - Advancement of apple culture; prospects of the western portion of the state, by W. F. Boggs) p.17-25. - Care in handling winter apples [by W. F. Grabs] p.25-26. - Preparing apples for market; p.27-28. - The diseases and insects affecting apple trees in North Carolina, with suggestions for their destruction by Gerald McCarthy, p.28-39.

Contains a miscellany of information such as apple grading rules, distances by rail to the principal fruit producing districts in the Northwest from Seattle; standard sizes of northwestern boxed apples; tables showing average number of days required in transit, approximate freight and refrigeration rates per box from principal producing districts of the Northwest to the more important seaports of the United States and Canada, and principal varieties of apples grown in the Northwest; and a list of the principal shipping members of the exchange in 1917 with an approximation of their outputs classified by varieties.
Photostat copy in Library: U. S. Bureau of Agricultural Economics.

"The data secured from planting operations conducted under the direction of the author during the past five years show a cost of $7.13 per acre for buying and setting out yearling apple and peach trees." - Exp. Sta. Record, v.38, p.41.

Total costs and cost per tree of planting and growing two experiment-farm orchards under sod-mulch and cultivated forms of management, 1912-21: p.XXIV.
Pruning the apple: p.XVIII.
Varieties of apples showing highest yields, 1910-1919: p.XXIX.

365. Ohio Dept. of agriculture. Division of plant industry. Official Ohio grades for apples, peaches, onions, and potatoes. Columbus, 1925. 11p. (Its Ed. 17)

"The purpose of this circular is to show, by a series of tables covering five years, the shipping seasons of the various states for crops important to New Jersey farmers and also the relative importance of each state in each month." -p.8.
Data on apples are found on pages 6, 8-10.

Consists mainly of summaries of transportation surveys made by A. L. Diederich and R. C. Oley in 1925 and 1926. There are thirteen tables. The following contain data relative to apples: estimated production of different kinds of fruits and vegetables in New Jersey and the percent of estimated production shipped by rail in 1925, hypothetical production of fruits and vegetables in Monmouth County in terms of carlots 1923 and 1924, - Census figures showing increase in use of horses and miles and contemporary changes in important crops grown, 1910, 1920, and 1925, in Burlington and Gloucester counties. Other tables deal with methods of shipping produce, truck rates, etc.

368. Oregon. Board of horticulture. Apple and pear grading law. (In its Biennial rept. 16th, 1921, p.33-41) Sl. Or.
"Effective on and after May 25, 1921."
369. Oregon. Board of horticulture. Oregon growers' association grading rules and regulations for apples and pears. (In its Biennial rept. 16th, 1921, p.181-190) 81 Or3


Contents: Division I, Foreign markets for Oregon fresh fruits.—Division II, Foreign markets for Oregon dried fruits. —Division III, Foreign markets for Oregon canned fruits, including preserves, fruit juices, jellies, etc. —Division IV, Statistics of fruit imports of foreign countries. —Division V, Laws and regulations of foreign countries concerning American fruits.

374. Overholser, E. L. Factors influencing the keeping qualities of apples and pears. (In Western Fruit Jobber, v.7, no.1, 1920, p.31-35) 268.83 W52M

"A contribution from the University of California, comprising an enumeration with brief discussion of various factors influencing the keeping conditions of apples and pears."—Exp. Sta. Record, v.45, p.232. Not examined.


"A detailed report on storage experiments with pears and apples."—Exp. Sta. Record, v.45, p.343.


"The investigations reported herewith were undertaken in an attempt to determine (1) the field conditions responsible for the susceptibility of the fruit to browning, and (2) the factors immediately responsible for its development in storage."—p.3.

Exp. Sta. Bul. 235)  
Purdue University, Agricultural Experiment Station in cooperation with the Bureau of Agricultural Economics, U. S. Dept. of Agriculture.  


Table V, p. 36, gives prices at the Richmond city market and at groceries for four Saturdays and the average for the four. Apples are included in the list of commodities.

Table VII, p. 36, gives total and per capita consumption, amount produced locally and imported of certain fruits, including apples. It also shows "how retailers view the comparative quality of locally produced products with imported ones."

Table VIII, p. 37, gives total pounds of each fruit imported into Richmond (including apples), number of carloads from different points, pounds imported in carloads, pounds imported by rail in less than carloads, pounds imported by truck from March, 1923, to February, 1924.

Table IX, p. 37, gives importations by months of each kind of fruit into Richmond from March, 1923, to February, 1924.


379. Package sales corporation, South Bend, Indiana. Packing and storage of apples inパスセコ packages. South Bend, 1923-12p. Fam. Coll,  
By Paul T. Schoolay and J. E. Eldridge, with the co-operation and assistance of Prof. J. S. Ralston ... [and] T. A. Natz."

"For many years bushel baskets have been used for shipping both fruits and vegetables, but very little attention has been paid to the proper method of packing this style of container. It is the purpose of this bulletin to supply this information which has been gathered through recent experiments conducted co-operatively with the Virginia Polytechnic Institute. Because of the suitability of this package for apples the data herein given applied to that fruit."-Preface.

380. Paddock, Wendell, and Whipple, O. B. Fruit growing in arid regions; an account of approved fruit-growing practices in the intermountain country of the western United States, comprising the states of Colorado, Montana, Idaho, Utah, Nevada, and in Northern Arizona and New Mexico, with applications to adjacent regions. N. Y., Macmillan co., 1910. 390p. 93 P13  
Varieties: p. 224-246. (Apples, p. 228-238)  
For information on grading, picking, etc., of apples consult the index.

"Several of the ... facts touched upon referring to common or air-

"The construction and equipment of packing houses and the operations involved in wrapping are set forth, together with a description of styles and counts of pack."-Exp. Sta. Record, v.52, no.9, Dec. 1925, p.895.

"One of the outstanding problems of the fruit and vegetable industry concerns the rejection of shipments purchased at point of origin by buyers in distant city markets. ... Phases of the problem which were given attention in this study include methods of sale of boxed apples, extent of rejections, amount of price reductions, disposition of cars which were rejected and resold by the shipper, reasons given by buyers for rejecting shipments or requesting allowances, relation of rejections to price changes, purchases on Government certificates, and confirmation of sales."-Introduction. Contains tables and charts.

"This bulletin deals with the details of construction, arrangement, equipment, and operation of boxed apple packing houses and is based on a study of methods and practices which have given the greatest satisfaction in commercial operations."-p.[2].

"This circular discusses the equipment needed and the methods used in sizing, grading, and packing both barrels and boxes. Recent legislation pertaining to the subject is noted in the appendix."-Exp. Sta. Record, v.30, p.41.

This well illustrated bulletin contains general information for the practical grower.

Number of bearing and non-bearing apple trees, and crab-apple trees owned are given for each owner of commercial orchards.


This is a report on a survey made during February and March, 1927, in Uniontown, Pittsburgh, Medville, Johnstown, Lewistown, Williamsport, Havelton, Reading, Philadelphia, and West Chester.

Titles of tables are Number and types of stores; Average weekly sales per store; Variety preferences; Kinds of apples, containers, and grades handled; and Summary of miscellaneous apple data.


391. Pennsylvania. Dept. of agriculture. Bureau of statistics. Special apple report based upon information furnished by commercial growers in different parts of the state, on September 1, 1922, compared with a normal yield. [1922?] 10. Mimeographed.

Information is given by counties and by varieties.


"Reprinted from the Report Iowa State Horticultural Society, volume LXII, 1917."

Deals with varieties of apples from Iowa, New York, Arkansas and Washington and "their keeping records in storage."


Fruits included are strawberries, pears, grapes, peaches, and apples. Statistical data, and also a map of Virginia, are given.

395. Phillips, R. G., and Fraser, Samuel. Wholesale distribution of fresh fruits and vegetables ... for the Joint council of the National league of commission merchants of the United States ... The Western
fruit jobbers' association of America; International apple shippers' association... Rochester, N. Y., Printed by the Fish-Lyman company, inc. [1922] 256p. 280.3 P54

"A survey was conducted by the joint council of three commission merchant and shippers' associations among large representative wholesale and commission firms at Boston, New York, Philadelphia, Pittsburgh, and Chicago, in order to ascertain the wholesale selling price of certain fresh fruits and vegetables, freight rates, the relationship between freight charges and the wholesale selling value of the commodities handled, actual handling costs, overhead, and other fixed costs, and to determine the profits or losses made by commission merchants and wholesale dealers in these commodities."-Exp. Sta. Record, v.48, p.596.

For pages dealing with apples consult the index, p.243.

Cost of handling apples: p.114-123.


Discusses form, size, color, uniformity, freedom from blemishes, correct naming, and box and basket exhibits of apples in relation to fruit exhibits.


Bibliography: p.54.

"The report embodies the results of investigations on the keeping quality of apples in storage as affected by varying treatments in the orchard, as time of picking, time of storing and soil cultural methods. Various storage conditions such as temperature, humidity, and aeration have been considered. Particular attention has been given to different types of apple wraps. The keeping quality of Jonathan apples has been compared in cold and common storage": p.3.


"In this, the fifth progress report upon apple storage investigations... the authors discuss work with Wealthy apples harvested August 27 and September 4 and 11, 1923, dates representing immature, mature, and overripe conditions."-Exp. Sta. Record, v.54, Jan. 1926, p.39.


The author states that his purpose is to make plain the principles underlying grading as he understands them.

402. Port of New York authority. Produce requirements in New York area; prepared by the Joint marketing research staff, W. P. Hedden, research agent. New York, 1925. 19p. 230.3 P833P

"This pamphlet and its companion, Some Facts About Margins and Costs, present partial results of careful studies conducted for more than two years by The Port of New York Authority in cooperation with the Bureau of Agricultural Economics of the United States Department of Agriculture."-Foreword.

Table showing net receipts of fresh fruits and vegetables at the Port of New York in 1921: p.6.

403. Port of New York authority. Some facts about margins and costs in marketing fruits and vegetables in the Port of New York district; prepared by the Joint marketing research staff, W. P. Hedden, research agent. New York, 1925. 15p. 230.3 P833S

In cooperation with the Bureau of Agricultural Economics, U. S. Dept. of Agriculture.

Pages 4 and 5 include a table and a map which illustrate the title of these pages, "An apple a day costs a lot on the way." The data are based on Margins and Costs in the Marketing of Washington Apples, by K. E. Garner.

Page 12 contains a chart which illustrates the subject "Consumers pay for credit and delivery." Commodities are California oranges, boxed apples, yellow onions, and northern potatoes.


In cooperation with the U. S. Bureau of Agricultural Economics.

Copy in Library, U. S. Bureau of Agricultural Economics.

The following sections contain data on apples: A study of the fruit and vegetable traffic movement within the Port of New York district, by W. P. Hedden. - A study of the commercial practices of the produce trade which influence terminal handling, by W. P. Hedden. - An analysis of existing cost data on terminal handling of fruits and vegetables, by W. P. Hedden. - Fruit and vegetable terminal facilities, by W. P. Hedden and H. Reese. - Progress report on retail margin study, and preliminary studies of jobbing markets for fresh fruits and vegetables in the Port of New York district, by C. E. Artman.
In cooperation with the U. S. Bureau of Agricultural Economics.
Copy in Library, U. S. Bureau of Agricultural Economics.
The following sections include material on apples: A study of dealers' margins on fruits and vegetables, by C. E. Artman. - A study of the hotel supply trade in fruit and vegetables within the Port of New York district, by E. P. Crossen. - Jobbing markets of Brooklyn and Queens, by C. E. Artman.

406. Potter, G. F. The apple grading law. (In Wis. state horticultural soc. rept. v.48, 1918, p.200-203) 81 W75T

This bulletin covers various phases of the industry, and is the report on the commercial apple industry made in 1925 in cooperation with the New England Research Council. "The work should be of value as a guide as to whether or not orchards should be planted; if so, as to what varieties may be used, and as to what methods or practices may best be used in present orchards in order to meet the forthcoming economic situation...The writers have not hesitated to add information and opinions as to the commercial characteristics of certain varieties, the necessity or value of certain orchard practices and other material not strictly gained from the growers' replies."-p.3.
Statistical tables give the following information: forecast of development of New Hampshire commercial orchards (by varieties) for 1925, 1930, 1935, and 1940; number of apple trees (bearing and non-bearing) in commercial orchards in the several counties, 1925; maps showing bearing and non-bearing trees; age of trees in the New Hampshire commercial orchards, 1925; trees and production in New Hampshire commercial orchards by varieties, 1925; age of the leading commercial varieties; varieties of fillers; age of filler trees; classification of New Hampshire orchards based on number of trees of bearing age; proportion of each of several important varieties of apples packed in different grades; prices of leading varieties of apples in New Hampshire; methods of sale, 1924; sales of apples classified as graded, ungraded, and culls; methods of moving New Hampshire apples to market; etc.

Discusses methods of packing apples in the standard farm produce box.

Pages 127-132 consist of discussion.
The author discusses the influence of temperature on the keeping quality of the fruit, the influence of maturity of the fruit,
of delaying the storage, of cultural conditions, of type of package, and of wrapper on keeping quality, behavior of fruit when removed from storage, and the importance of good fruit for storage.


"A discussion of maturity, decay in storage, temperature, wrapping and packages for the storage of pears, peaches and apples."-U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.


"Description of a comprehensive series of experiments on various varieties of apples from several states when held in cold storage. Culture of fruit, maturity, packages, size of fruit, temperatures, and scald."-U. S. Dept. Agr. Library. Bibliographical Contributions, no.4, p.6.

413. Pratt, P. A. Does wood of the box affect the flavor of apples? (In Better Fruit, v. 9, no.3, Sept. 1913, p.25) 80 346


The report of an experiment to determine the keeping qualities of standard varieties of apples grown in Iowa.


Virginia Experiment Station Bulletin 82 is an earlier bulletin on the same subject.

Charts on temperature and rainfall are for years 1893-1904.

Normal bloom chart. Crab apples and apples: p.132-142.


Contains a cable abstracted from the Market Reporter, of the U. S. Bureau of Markets, June 5, 1920, which gives carloads of apples unloaded at ten large cities by states of origin, 1915-1919, inclusive.

Ext. div. Bul. 91)

"The matter presented in this bulletin is the result of a survey of the apple markets of the South. The investigation was made, especially, to determine the factors which are limiting the sale of Virginia apples in the Southern States, and to study methods of increasing their market value." - p.x.

On p. 16 there is a statistical report, with summary, showing seasonal business of wholesale dealers - the summary classifies the business in barrel, box and bulk shipments.

Pages 17-33 contain detailed reports of the interviews with wholesale dealers.


"This publication embraces the results with recommendations deduced from an investigation of apple-shipping conditions in the Northwest during the season of 1917-18, when an unprecedented car shortage existed. The phases discussed include conditions in 1917, temperatures in heavy loads, handling heavy loads under ventilation, fluctuating temperatures in box cars, condition upon market arrival, excessive breakage caused by poor loading methods, relation of heavy loading to distribution, methods of shipping during 1917 season, and recommendations." - Exp. Sta. Record, v.39, p.748.

Six tables give weekly carload shipments of northwestern apples, and summaries of weekly carload shipments from Wenatchee and Northern Columbia, Yakima Valley, Hood River, Medford, Grants Pass, Gold Hill, Voochies, Dallas, and Ashland, and Walla Walla, Lewiston, Milton, Freewater, Meier, Taggard, and Dufur shipping points, August 15 to Dec. 15, 1917. Figures given are for number of carloads, number of boxes and average load carried in refrigerator, ventilated and box cars.


"During the seasons 1911-12 to 1914-15, inclusive, extensive investigations were conducted by the United States Department of Agriculture to determine these factors which are of the greatest importance to the successful storage of apples of the Pacific Northwest. For this purpose apples were secured from the various more important apple-growing sections of Washington, Oregon, Idaho, and Montana."

There is an abstract of this in Better Fruit, v.12, Dec. 1917, p.9.

In three parts. Part I: Influence of cold storage on the decay of apples - effect of wrapping apples in paper, by F. Wm. Rane; part II, Influence of cold storage on the decay of apples - effect of wrapping apples in paper, by Herbert H. Lamson; and part III, Chemical changes in apples during storage, by Fred W. Morse.

Table showing range of prices for cold storage apples, each of seven months of the years 1893/94-1899/1900, inclusive: p. 70.


Discusses costs, the home orchard, the commercial orchard, location, selection of varieties, stock, culture, etc.

Table showing cost of establishing an orchard: p. 2.

423. Rees, R. W. Apple survey of the United States and Canada. New York, Department of agricultural relations of the New York Central lines [1923] 64p, 95 RS.

"Based on travel throughout the apple-producing regions of the United States [and Canada] and also on extended studies, the author presents a comprehensive discussion of present conditions and future prospects in the various districts, offering in general an optimistic outlook for the apple industry." Exp. Sta. Record, v. 54, p. 644.

Includes a map showing approximate acreage of bearing trees in the United States, 1919; a graph illustrating grades produced; chart showing relative production of ten commercial varieties of apples in Western New York (from records of 1921 and 1924 seasons); production of oranges and grapefruit in California, 1904, 1914, and 1924; graph showing the gradually increased market movement of apples and citrus fruits, and their relative importance, 1919/20-1923/24; and an illustration showing the number and per cent of increase or decrease of apple trees and population of the United States, 1900, 1910, and 1920.


New Hampshire Agricultural Experiment Station, University of New Hampshire Extension Service, Bureau of Agricultural Economics, U. S. Dept. of Agriculture, and Cheshire County Farm Bureau cooperating.

"Cheshire County, with its decreasing number of farms and decreasing agricultural production, together with increased transportation costs on receipts of food commodities and a growing number of urban residents, has been chosen as typical of the changes that are taking place in agricultural production over a large part of New Hampshire and New England." p. 5.

Appendix. The following statistics are given: monthly freight receipts at Keene, year ending Sept. 30, 1924; freight rates on apples from Keene, N. H., and Wenatche, Wash., to Boston, 1917-
1922; average price received by Massachusetts growers for best grade and poor grade Baldwin apples on Boston market, 1921–1924; number of apple trees and production by districts; production and marketing costs; store purchases of produce from local farmers, compared with importation from outside the county, arranged by towns and districts; and number of bearing and non-bearing trees and yield by districts for Baldwin, McIntosh and other varieties of apples.

   "A discussion of management costs reported from a representative apple orchard included in the system of community demonstration orchards inaugurated by the Purdue Experiment Station some five years ago."—Exp. Sta. Record, v.35, p.142.


   This bulletin also contains a report on experiments "undertaken to determine the effects of various cleansing treatments on the dessert and storage quality and also upon the appearance of the fruit."—Table XVI-XXXIII deal with this subject.

   The apple: p.8-30. In this section, soil and situation, shaping of the tree, thinning, roots, gathering and storing are briefly discussed. A list of commercial varieties is included.

   "This is a study of the wholesale prices and receipts of apples in Boston for 36 years, based on data obtained from the Weekly Review of the Boston Produce Market Report, and including the prices of different varieties by months and years."—Exp. Sta. Record, v.33, p.295.
   Years covered are 1879/30-1914/15.

   This bulletin gives the results of a survey designed to give a general picture of production practice in New Hampshire and conducted in 1924 and 1925. A table gives the number of different varieties of apples, by act, and the number to be planted in 1925-1929.

431. Rose, D. H. Diseases of apples on the market. A statistical study based on certificates issued by the Food products inspection service
of the Bureau of agricultural economics during the period from November 1, 1917, to July 1, 1921. Washington, 1924. 34 p. (U. S. Dept. Agr. Bul. 185)

"An analysis is given of data secured from inspections made by the Bureau of Markets, U. S. D. A., as to diseases in the commercial apple crop in a number of portions of the United States."—Exp. Sta. Record, v. 51, p. 753.


"The purpose of this bulletin is to present in a concise form statistics of fruit and fruit products, including production and trade for the principal producing, exporting, and consuming countries. The figures used have been taken from official sources, usually from publications of the countries treated. Data concerning commerce in fruits are as a rule fairly complete, but those relating to production if not entirely lacking are in many instances either fragmentary or limited to census years."—Introduction.

The following statistics of apples are given for the United States (these are taken from tables; statistics in the text have not been noted): Number of apple trees of bearing age, 1910; production of apples, 1909; value of apples, 1909; quantity and value of exports of dried and green or ripe apples for the years ending June 30, 1910 and 1915; shipments of green or ripe apples from the United States to Hawai'i for the years ending June 30, 1910 and 1915. These are figures from the 13th Census.

433. Sackett, W. M. Fruit marketing. (In Mont. horticultural soc. Rept. 1918, p. 81-86) 81 M762

This article deals with apple marketing.


"The field work of this survey was begun early in the summer of 1915 and finished late in the fall.

This bulletin contains numerous statistics of the fruits grown in Mesa County. In addition to information such as size of orchards, names of varieties of fruit grown in the County, etc., the following statistics are given for apples: cost of spraying, acreage, cost of production, yield, number of trees by districts with certain percentages, total acreage and bearing acreage by districts, carlot shipments from Grand Valley for the years 1911 to 1915 inclusive, and percentage of varieties grown in each district.


"Results are given of a statistical survey of the apple, cherry, plum, prune, peach, apricot, and pear orchards of Fremont County, Colo., with reference to distribution, acreage, number of trees,
age, and condition. "General information is also given relative to
the soils and climatology and the general condition of the orchards
and crops grown in the orchards, together with some historical data
on fruit growing in the county."-Exp. Sta. Record, v.43, p.144.

436. Sandsten, E. P., and Tompkins, C. M. Orchard survey of the Arkansas
Bul. 273)
Contains data similar to that in Bulletin 272.

427. Sandsten, E. P., and Tompkins, C. M. Orchard survey of the northeastern
Sta. Bul. 272)
This fruit district includes Larimer, Boulder, Jefferson, Adens,
and Arapahoe counties. The following statistical data on apples are
given for each county: Number of orchards and number of apple trees
in each orchard district, number and varieties of trees grown in the
county and their distribution, and distribution, acreage, age and
condition of trees by districts. Tables showing percentages of six
principal varieties of apples grown in each district and county, and
distribution in percentage each fruit bears to the total number of
all fruit trees for each district are given for some counties.

438. Sandsten, E. P., and Tompkins, C. M. Orchard survey of the Southwestern
Sta. Bul. 274.)
Contains data similar to that in Bulletin 272.

439. Sandsten, E. P., and Tompkins, C. M. Orchard survey of the western dis-
Bul. 275)
Contains data similar to that in Bulletin 272.

440. Sarle, C. F. Reliability and adequacy of farm-price data. Washington,
"Literature cited": p.65.
"This bulletin is designed to meet the needs of those students
and research workers in the field of agricultural economics who may
have occasion to work with the farm-price data which are collected
and published by the Department of Agriculture. It is intended pri-
marily for those students who are familiar with technical, statisti-
cal terms."-p.2.
Apples: p.55-57. Includes a table - "Farm Prices of Apples:
Selected Illustrations of Size of Sample, Measures of Dispersion,
and Probable Error."
Table 26, p.57, Percentage difference between December 1 prices
and crop-year average of monthly prices of corn, apples, etc.

441. Scott, W. M., and Alwood, W. E. Preliminary report on apple-packing
Bureau of Markets. Doc. 4)
This is a report of investigations conducted in 60 packing
houses in Oregon and Washington. The items reported on are community packing houses and their equipment, packing-house organization and personnel, details of operation, and operations in two typical houses. Several pages are devoted to a "Suggested floor unit."


"This describes in detail methods employed successfully in representative orchards throughout the country in harvesting, grading and packing, hauling, and loading barreled apples, including details of packing-house arrangement and equipment."-Exp. Sta. Record, v.42, p.39-40.


"This publication points out methods of advertising and agencies which might be interested in an advertising campaign and the part which each one would be expected to play. A number of typical illustrations are included."-Exp. Sta. Record, v.36, p.494.


In addition to chapters on orchard culture, insects, diseases, etc., there are chapters on picking and handling, storing, grading and packing, marketing, advertising, and laws affecting orcharding. Information on apples may be located through the index.


Table 2, Estimated cost of an apple orchard per acre for first ten years above cost of land, taxes, drainage, interest on investment, etc. Table 3, Estimated cost of growing and marketing the apples from one acre yielding 30 barrels. Pages 11 to 16 explain these tables. Figures from commercial orchardists.


An explanation of the law.


"The subject matter of this bulletin is a summary of lectures
delivered by Mr. O. B. Shay at a series of meetings held for fruit growers in the Wenatchee District."—p.3.
Illustrated by charts showing: the fluctuation in apple production in the United States during the past 35 years (1889-1923); both total and commercial production of apples in the United States for the past eight years (1916-1923); the average cost per box on yields ranging from 200 to 1000 boxes per acre and on the average yield of the Wenatchee district for 1923 of 442 boxes per acre; the average per-acre yield of the Wenatchee district during the past 12 years (trees of bearing age only); and also two "profit and loss" charts; and by tables showing cost of growing and harvesting the 1933 apple crop; effect of quantity yield on per box cost and effect on profit and loss; and effect of better quality production on average returns.

"A paper on this subject presented before the Washington and Oregon State horticultural societies."—Exp. Sta. Record, v.34, p.438.

Copy in Library, U. S. Bureau of Agricultural Economics.
"An attempt will be made to show some of the weaknesses of the apple industry, with special emphasis on the marketing of the fruit."—First paragraph.
The writer discusses containers, packing, grading, methods of marketing, storage, and co-operative associations.

The writer discusses the various phases of the critical situation which occurred after an early October frost.

452. Simpson, F. H. Essentials in handling fruit. (In American apple growers' congress. Trans. 5th, 1907, p.194-200) 81, Apr34
The author discusses preparation to handle the crop, picking and packing, and storage and selling.

Address delivered at Fruit Growers' Conference, Lafayette, January 13, 1927.

"Description of a cool storage to be built in the orchard. Discussion."—U. S. Dept. Agr. Library. Bibliographical Contributions,
no. 4.
Keeping apples in common storage is discussed, mainly by A. W. Brayton, on pages 413-416 of the same volume.


456. Snyder, W. P. Chemical and physical changes in apples during the ripening and storage period. (In Ind. horticultural soc. Trans. 1916, p.408-411) 81 In2

457. Spillman, W. J. Investigations on the cost of growing apples. (In N. Y. State fruit growers' assoc. Proc. 13th, 1914, p.115-119; also in National Stockman and Farmer, v.37, no.47, Feb. 21, 1914, p.18) 81 M43; 6 N21 This is a report on investigations being made at that date in New York State. There are two tables which contain figures on cost of producing apples (per acre) in Monroe County, N. Y., 1909, 1910, 1911, and 1912. There are a few statistics for Orleans County, 1910, 1911, 1912.


460. Steinhart, J. W. Utilizing the waste in commercial orchards. (In Nebr. state horticultural soc. Rept. 47th, 1916, p.133-138) 81 N27 The author writes that strictly speaking his subject should be "salesmanship in the disposition of the products of the orchard."

461. Stine, A. E. Some suggestions for Rhode Island apple growers. (In R. I. Board of agr. Annual rept. 25, 1909, p.93-181) Also issued separately and printed by E. L. Freeman Company, State printers, 1910. (95 St42) "This is a popular treatise on apple culture with special reference to Rhode Island conditions. It discusses the financial
outlook in orcharding, orchard conditions in Rhode Island, purchase of nursery stock, varieties, soil and site, preparation of new land, planting and cultivation, cover crops, cross-pollination, pruning, thinning, orchard fertilization, insects, plant diseases and spraying, protection against mice and other rodents, renewal of old orchards, dwarf apples, harvesting and marketing, storage, and apple by-products. "-Exp. Sta. Record, v.24, p.545.

"In 1895 the author planted 6 acres of land in the Yakima Valley of Washington to Spitzenburgs and Red Cheek Pippins. A brief account is given of the methods of culture employed, together with a tabulated statement of annual yields and returns obtained from this orchard from 1898 to 1906, inclusive, and a description of the methods of packing and grading."-Exp. Sta. Record, v.19, p.1142.

Picking, proper handling for storage, and packing are discussed on p.128-131.
Pennsylvania Agricultural Experiment Station Bulletin 106 is an earlier bulletin with the same title and by the same author.

"Bibliography: experimental work on apple tree fertilizers, &c": p.471-474.
"Bibliography to cultural methods and allied subjects": p.488-492.
"Bibliography: on cion selection and other phases of apple breeding": p.499-500.
A survey of the general status of the industry is to be found on pages 401-405. There are three tables in this section. They show the production of apples, pears, etc. in the United States, 1889, 1899, and 1909 and the number of trees of bearing ages, 1890, 1900, and 1910 (census); value of specified kinds of fruits produced in the United States in 1899 and 1909 (census); and the production of apples in the United States and individual states, 1899 (census estimate) and yearly from 1899 to 1910, inclusive, as estimated by the American Agriculturist.
There are numerous tables illustrating the rest of the article.

"The experiments here have been in operation since 1907-08... The present discussion is based directly on six experiments in bearing orchards, and covers a production of 36,192 bushels of fruit during the last ten years." Tables show influence of ferti-
lization on yield and growth, influence of fertilizer elements on yield, color, size and growth, etc.

Bulletins 91, 100, 121, and 134 also deal with orchard fertilization.


"The experiments covered in this bulletin were started by the writer chiefly in 1907 ... Results from three of the ... experiments on young trees are given in Bulletin 134; the two others are considered here... The methods under comparison are tillage alone, tillage with a cover-crop, sod-mulch, and sod... The general object is to determine so far as possible the true influence of the various treatments on yield, growth, color, and average size of apples, and eventually to determine the reasons for the differences observed."-p.6.


Contains tables. Years covered are 1908-1916, for the most part.


The publications are classified under the following subjects: starting apple orchards; cultural methods and cover cropping; orchard cover crops and irrigation; orchard fertilization, fruit thinning and girdling; pruning, grafting, and orchard renovation; picking, packing and marketing fruit, and utilization of inferior grades; peaches and cherries; plums, pears, and quinces; the control of insects and diseases; spray materials, preparation, use, machinery, legislation.


Table II, p.12: Products sold or added to inventory (including apples) per farm on 159 dairy farms and 190 general farms, Grove City, Pa., area.

Table IV, p.14: Sources of receipts on same farms.

Table V, p.15: Distribution of crop area on same farms.


This bulletin discusses the extent and development of the industry and contains directions for the starting and the culture of an orchard, pruning, spraying, and the disposal of a crop (grading, packing and transportation). A list of varieties is included.
Statistical tables contain the following: Number of trees, total production, average yield per tree, and percentage yield of state; for certain counties in 1899; shipments by counties for a series of years; production and shipments by counties, 1910(?); and a chart showing the "extent of commercial orcharding in Vermont and location whence shipments originate."

471. Stubenrauch, A. V. Fruit and vegetable transportation and storage investigations by the Department of Agriculture. (In American ware- housemen's assoc. Proc. 23d, 1913, p.116-142) 297.9 Am32


The following information given in tables will give a pretty fair idea as to what subjects the bulletin covers: number of bearing trees, and production of apples in Virginia and in Frederick County, 1889, 1899, 1909, 1919, and 1924; acreage and production of wheat, corn and hay, and number of bearing trees and production of apples, Frederick County, 1879, 1889, 1899, 1909, 1919, 1924; summary of the farm business of three types of farms in the County, average for 1916-1920; crop acreage, yield per acre, crop receipts for apples, corn, wheat, hay, and other crops, and productive animal units and receipts from livestock under different systems of farming, average for 1916-1920; acreage of orchard planted in different years since 1861 (to 1921) on 48 orchard farms; distribution of acreage in bearing orchard, by age of trees; distribution of varieties on 48 orchard farms in 1920; average valuation and average distribution per farm of 48 orchard farms, 1916-1920, inclusive and average; distribution of acreage per farm, 1916-1920, inclusive and average; livestock kept on farms, not including work animals, average 1916-1920; labor and power used per farm, 1916-1920, inclusive and average; quantities of apples, corn, wheat, and hay sold per farm and average price received for each, 1916-1920, inclusive and average; distribution of receipts per farm (apples included), 1916-1920, inclusive and average; distribution of family living from farm, average 1916-1920; summary of farm business, 1916-1921, inclusive-average for 1916-1920; total apple production of orchards and relative incomes, summary of production and returns and different yields of apples, organization of farms of different sizes and of different producing capacities - average 1916-1920; intercropping practice and relative yields of apples, average 1916-1920; detailed costs of producing apples per farm, per acre and per barrel, 1916-1920, inclusive and average; net cost, selling price, and net return per barrel of apples, 1916-1920, inclusive and average; size of orchards, yield per acre and cost of production, average 1916-1920; and also several charts.

This bulletin gives the text of the Maryland apple grading and packing law, calls attention to similar laws enacted by other States and by the Federal Government, explains the requirements of the law, and gives suggestions relative to harvesting, grading and packing apples."—Exp. Sta. Record, v. 37, p. 143.

Talbert, T. J., and Merrill, E. S. Picking, packing, and shipping apples. Columbia, 1926. 44p. (Mo. Agr. Exp. Sta. Circ. 147)

Contains practical information on picking, harvesting, packing, loading, and shipping apples, grades and standards, packs and packages. There is also a list of Missouri varieties suitable for packing in barrels, baskets or boxes.

Tate, A. W. Apple standardization. (In Calif. State commission of horticulture. Monthly bul., v. 6, no. 8, Aug. 1917, p. 332-334)

An explanation of the Standard Apple Act of 1917.


Compiled jointly by United States Department of Agriculture, Bureau of Agricultural Economics, and Virginia Department of Agriculture, Division of Agricultural Statistics, Division of Markets.

An historical account of the industry with a list of "references" is to be found on pages 3-7.

This bulletin is quite comprehensive and contains much statistical information relative to the apple and peach industries of Virginia. The index should be freely consulted.

Statistics relating to production, shipments, number of trees, bearing and non-bearing, percentage of a full crop produced, unloads for various cities, exports, cold storage holdings, varieties, and age are given for apples for various years.

Taylor, W. A. The commercial apple area. (In American Gardening, v. 23, no. 404, Sept. 20, 1902, p. 613) 80 AmE

"The author gives statistics from the Twelfth Census which indicate that more than three-fifths of the total number of apple trees grown in this country are found in the North and South Central States ... In the more Northern States the chief commercial varieties grown are Baldwin, Rhode Island Greening, Northern Spy, Tompkins King, Rubicuron, and Russians. Farther south Ben Davis, Winesap, York Imperial, Minkler, Grimes, and Willow Twig are the chief varieties."—Exp. Sta. Record, v. 14, p. 489-490.
Reprinted, with additions, from the Yearbook for 1897.
Exports of apples (fresh and dried), vinegar, and cider are found on p.344-345. The amount and value of apples exported are given for decades ending 1830, 1840, 1850, 1860, 1870, 1880, 1890, and 1891-1897, and annually for 1891-1897, inclusive. Amount and value of exports of dried apples are given for decades ending 1870, 1880, 1890, and for 1891-1897, and annually for 1891-1897, inclusive.

480. Taylor, W. A. The influence of refrigeration on the fruit industry.
"Importance of refrigeration for apples": p.570-572.
"Effect of refrigeration upon the apple trade": p.572-573.

481. Taylor, W. A. Some lessons from the apple export season of 1906-07.
(In American apple growers' congress. Trans. 5th, 1907, p.228-235)
81 Am34
This paper includes some statistics on the quantity of apples produced in and exported from the United States.
Discussion: p.234-235.

Investigations made to discover the possibility of slowing up the ripening of fruits by means other than cold storage. Different gases were used. -U. S. Dept. Agr. Library. Bibliographical Contributions, no.4.
Not examined.

"An account of the station's experience in marketing apples by parcel post during the past three years. The styles of packages used are illustrated and described and the results of shipping tests for each year are given." -Exp. Sta. Record, v.36, p.742.

"Deals with the results of a farm-management survey of about 100 irrigated farms in Utah Lake Valley in Utah."
Table V, p.5: Distribution of crop (including apples) receipts on farms operated by their owners and on farms whose owners rent additional land.
Short paragraph on apples: p.15-16.
On page 16 there is a table which gives prices paid by a canning factory at Provo for berries, tomatoes, apples, and other fruits.


"This is the second of a series of bulletins giving information relative to different methods of orchard management and the cost of apple production in different apple-growing districts... The present bulletin reports a detailed study made in 1914-15 of the current cost factors involved in the maintenance of orchards and the handling of the crop on 125 farms in the fruit region of Mesa, Delta, and Montrose counties, Colo."-Exp. Sta. Record, v. 36, p. 841.


This bulletin "reports a detailed study in 1915 of the current cost factors involved in the maintenance of orchards and the handling of the crop on 38 representative bearing orchards in the Payette district in western Idaho."-Exp. Sta. Record, v. 39, p. 140.


There are 17 statistical tables giving dates of frosts, rainfall and mean annual temperature; size of farms and of investments for farms studied; packed-box yields; relation between manuring practices and costs of apple production; average time and cost of pruning, thinning, and propping; cultivation practices; cultivation costs per acre and per box; credit derived from mulch crop; spraying practices and costs; average cost for hauling where a crew of one man and two horses is used; average cost for handling other than hauling; summary of all labor costs; summary of material and fixed costs; summary of all costs; and effect of yield upon cost.


In addition to culture, selection of varieties, picking and marketing are discussed.


"The author gives cost data and returns secured from an old apple
orchard over a series of years."—Exp. Sta. Record, v.34, p.438.


Deals mainly with varieties and grading. 
Discussion: p.117-124.

Amount and value of exports of apples in boxes and in barrels, 1925, by countries of destination: v.1, p.46.
Amount and value of exports of dried and evaporated apples, 1925, by countries of destination: v.1, p.41.
Amount and value of exports of canned apples and apple sauce, 1925, by countries of destination: v.1, p.42.
Amount and value of exports of barreled and boxed apples, dried and evaporated apples, and canned apples and apple sauce, 1925, by customs districts: v.1, p.283, 284.
Amount and value of imports of fresh apples, 1925, by countries of destination: v.1, p.207, 208.
Amount and value of imports of fresh apples, 1925, by customs districts: v.1, p.270.
Rate of duty, amount and value of total duty, and equivalent ad valorem on fresh apples, dried, dessicated or evaporated apples, otherwise prepared or preserved apples, and apple cider, imported for consumption, 1925: v.2, p.22, 23, 26, 29.
Earlier volumes of this publication should be consulted for earlier statistics. For current statistics see Monthly Summary of Commerce and Navigation.

Average wholesale price per barrel of fresh Baldwin apples, 1913, 1920, 1921, 1922, 1923, and 1925, index numbers 1924 and 1925 for the United States: p.315.
Quantity and value of imports of apples, 1922, 1923, 1924, and 1925: p.473.
Quantity and value of exports of fresh, dried, and evaporated apples, average 1910-1914, annually 1921-1925, inclusive; canned apples and apple sauce, 1924 and 1925; p.512-513.
Acreage cropped, production, value, and yield per acre of apples on irrigated lands, 1924 and 1925: p.572.
Number of trees of bearing age, production, yield per tree on irrigated and non-irrigated land in states having irrigation projects, and value of apples on irrigated land, 1919: p.576.
Production of apples, United States, and states, 1909, 1919, 1924, and 1925: p.663.
Quantity and value of canned and dried apples, 1914, 1921, and 1923: p.681.

Production, amount of apples sold, sales per cent of production, and value of production and sales for the United States, 1919: p.718, table 17.
"The leading crops (potatoes, hay and forage, apples) on the basis of value, in each state, 1919."-p.705-706, table 9.
Number of trees of bearing and non-bearing ages, 1910 and 1920, with farms reporting in 1910 and 1920; production, 1919, 1909, 1899, and value, 1919 and 1909 of apples, peaches, etc., for the United States.-p.860, table 136.
Apples - number of trees, bearing and non-bearing, with farms reporting, 1920 and 1910; production, 1899 to 1919; and value, 1919 and 1909, by divisions and states.-p.833, table 140.

Statistics for almost all of the states have been published separately. Others will be published shortly.
Each publication includes the following data on apples for each state, by counties; number of bearing and non-bearing trees, and number of bushels harvested for 1924, and the same information for the state with comparative figures for 1919 and 1909.
The sections on agriculture of the other Censuses should be consulted for other data.

This consists of a brief statement as to the first apple orchards in America; a table which shows amount and value of apples exported from the United States, annually, 1820/21-1852/53, inclusive, and the value of vinegar exported annually, 1825/26-1852/53, inclusive; and statements from people in the various states as to varieties planted, cost and profit of an orchard,
cultivation, pruning, prices, etc.

498. U. S. Congress. House. Committee on coinage, weights and measures. Fixing standards for hampers, round stave baskets, etc., and establishing standard apple box. Hearings ... 66th Cong., 2d sess. on H. R. 12350. A bill to fix standards for hampers, round stave baskets, and splint baskets for fruits and vegetables, to establish a standard box for apples, and other purposes. Friday, April 2 [and 9], 1920. Washington, Govt. print. off., 1920. 2 pts. (61p.) 93 Un32T

Contains statements of Hon. Edith Mourse Rogers, and Mr. Lloyd S. Tenny. Apple standards are discussed.

500. U. S. Congress. House. Committee on coinage, weights, and measures. Standard barrel and grades for apples. Hearings ... on H. R. 17936, to establish a standard barrel and standard grades for apples when packed in barrels, and for other purposes. March 7 and 8, 1912. Washington, Govt. print. off., 1912. 91p. 93 Un32


These bulletins contain estimates and forecasts of production, growing, condition of crops, prices, etc.
Farmers' Bulletin 620 contains an article by C. W. Moomaw entitled Marketing the Apple Crop.
Farmers' Bulletin 672 contains the following statistics on
apples: apple crops of 1913 and 1914 - percentage shipped out of counties where grown (by geographic divisions); apples in cold storage, Apr. 1, 1913, Dec. 1, 1914, and Jan. 1, Feb. 1, Mar. 1, and Apr. 1, 1915; prices paid to producers, Mar. 15, 1914 and 1915, for U. S., and each state; average U. S. price paid to producers, Mar. 15 each of 1911-1915, Apr. 15, 1913 and 1914, Feb. 15, 1913, 1914 and 1915.

505. U. S. Dept. of agriculture. Carload shipments of fruits and melons from stations in the United States for the calendar years 1920, 1921, 1922, and 1923. Prepared by the Bureau of agricultural economics. Washington, Govt. print. off., 1925. 79p. (Its Statistical bul. 8) 1 Ag84St

"This bulletin shows for each of 17 kinds of fruits and melons the number of cars billed during the calendar years 1920, 1921, 1922, and 1923 from every station handling 10 or more cars in any one year, grouped by States and counties. The information has been compiled from monthly mail reports furnished to the bureau by about 15,000 station agencies of railroad, express, and boat lines. Wherever possible, these reports have been checked against daily telegraphic reports rendered by the operating departments of the carriers against all other available sources of information."-p.1.

Apples: p.2-23.

506. U. S. Dept. of agriculture. Carload shipments of fruits and vegetables from stations in the United States for the calendar years 1924 and 1925. Washington, 1927. 138p. (Its Statistical bul. 19) 1 Ag84St

Compiled by Mary Hall of the Fruit and Vegetable Division, U. S. Bureau of Agricultural Economics.

Apples: p.2-19; dried apples: p.20.

507. U. S. Dept. of agriculture. Cold-storage holdings to October, 1924. Washington, 1925. 32p. (Its Statistical bul. 4) 1 Ag84St

"This bulletin is a revision of Statistical Bulletin No. 1, Cold-storage Holdings, issued August, 1923," which consisted of "compilations of the regular monthly reports made to the former Bureau of Markets and to the Bureau of Agricultural Economics." Commodities include apples, butter, cheese, eggs, poultry, meats, lard, and fish.

508. U. S. Dept. of agriculture. Cold-storage holdings, year ended December, 1925, with comparable data for earlier years. Prepared by the Bureau of agricultural economics. Washington, Govt. print. off., 1926. 32p. (Its Statistical bul. 13) 1 Ag84St

"This bulletin brings to dates shown the data originally published in Statistical Bulletin No. 4, 'Cold-Storage Holdings.'" There is an index to the bulletin on p.31.

Cold-storage holdings of barreled and boxed apples are given for

This publication contains estimates, monthly crop conditions, prices, etc. The following is a brief statement of the principal statistical tables dealing with apples; others may be found by consulting the individual numbers:


July, 1926: Estimated gross value of apples and per cent of crop total, 1924 and 1925: p. 226.

April, 1926: Unloads of apples in 36 different cities and totals for United States: during 1925: p. 130. Production of total crop and of commercial crop, in 5 leading states, with per cent of U. S. total, 1924 and 1925: p. 118.


Oct. 1925: Percentages of commercial crop of summer, fall, and winter varieties, by states, 1925, 1924, 1925, and usual: p. 323.

April, 1925: Production of total crop and of commercial crop in five leading states, with per cent of U. S. total, 1922, 1923, and 1924: p. 111.

the first of most months, 1915-1925, with five-year averages, as of January 1: p. 7.


April, 1924: Total and commercial production of apples in five leading states, 1921, 1922, and 1923: p.118.


Jan. 1924: Jobbing prices, and arrivals (classified by varieties) for certain months, 1923, at New York, Boston, Baltimore, Chicago, and St. Louis, and total shipments, by varieties, 1922 and 1923: p.34. Chart showing total carlot shipments of all domestic fruits and vegetables, compared by percentages, 6-year average, 1916/17 to 1921/22: p.36.

510. U. S. Dept. of agriculture. Experiment station work, XV. Washington, 1900. 31p. (Its Farmers' bul. 119)

The following articles by V. A. Clark on p.5-13 relate to apples:

Storing apples without ice; Cold storage on the farm; Mechanical cold storage for fruit; and Keeping qualities of varieties of apples.


This periodical is very well indexed so it has seemed unnecessary to bring out each table: Monthly cold storage holdings and weekly and monthly carload shipments occur regularly, as do arrivals, weekly prices at certain markets, and weekly prices on the British apple market.

The following have been noted:

Chart showing total carload shipments of barreled and boxed apples and unloads at 12 cities, 1917-1920: v.4, no.18, Oct. 29, 1921, p.281. Commercial barreled and boxed apple crop for years 1916-1920, inclusive, with estimate for 1921: v.4, no.8, Aug. 20, 1921, p.121.


Summary of emergency tariff rates on leading farm products compared with rates under 1913 tariff act: v.3, no.25, June 18, 1921, p.400.

Carloads unloaded at Pittsburgh, monthly, for the years 1916-1919, inclusive, with average; and unloads at Pittsburgh by states of origin, 1916-1919, inclusive: v.3, no.24, June 11, 1921, p.377. (The same information is given for Philadelphia, v.3, no.12, Mar. 19, 1921, p.186)

Carlot shipments, boxed, barreled apples, seasons 1919/20, 1918/19, 1917/18 and to Dec. 31, seasons 1920/21 and 1919/20: v.3, no.5, Jan. 29, 1921, p.73.

Price ranges of apples (monthly) 1920 at New York, Boston, Baltimore, Chicago, and St. Louis: v.3, no.7, Feb. 12, 1921, p.106.

Carloads of apples unloaded at New York City, annual, monthly, and average, for years 1916-1919, inclusive: v.2, no.11, Sept. 11, 1920, p.175.


British maximum wholesale prices of apples effective Nov. 15, 1920: v.2, no.8, Aug. 21, 1920, p.119.


Unloads of apples at Chicago, annually, monthly and averages, for the years, 1916-1919, inclusive; unloads at Chicago, annually for same period, by states of origin: v.2, no.5, July 31, 1920, p.70.

Monthly unloads, with averages, and total for each year, at Kansas City, for the years 1916-1919, inclusive; unloads, annually 1916-1919, inclusive, at Kansas City, by states of origin: v.2, no.1, July 3, 1920, p.9.

Annual unloads of apples at Cincinnati, by states of origin, years 1916-1919, inclusive: v.1, no.24, June 12, 1920, p.361, i.e. 377. (Monthly unloads also given

Monthly unloads at each of 10 large cities, 1919, and unloads of apples (boxed, barreled) by states of origin at each of 10 large cities, annually, 1916-1919, inclusive: v.1, no.23, June 5, 1920, p.361.

Shipments and unloads of apples (boxed, barreled) in 10 cities, for the years, 1916-1919, inclusive: v.1, no.23, June 5, 1920, p.360.

Carloads of apples (barreled, boxed) received at each of 15 important markets, years 1916-1919, inclusive: v.1, no.21, May 22, 1920, p.329.


Unloads at each of 28 cities from Washington, Virginia, West Virginia for the years 1916-1919, inclusive: v.1, no.16, Apr. 17, 1920, p.247.


Cold storage holdings of boxed, barreled apples, 1914/15-1919/20

The monthly crop reporter is a resumption, in size and nature of material, of the Crop Reporter, which was discontinued with the issue of June 19, 1913. It succeeds the Agricultural Outlook, published from September, 1913, to April, 1915, as Farmers' bulletins. v.1-5, no.1 have title: Monthly Crop Report.

In Jan. 1922, it combined with the Market Reporter and the National Weather and Crop Bulletin to form Weather, Crops and Markets.

This publication contains much data on apples. In addition to monthly reports on crop conditions, yearly crop summaries, monthly estimated values of farm products, and monthly average prices received by farmers (all of which contain data on apples) the following have been noted. Latest data only have been included in this brief index, but earlier data may usually, but not always, be found in the issue for the same month of other years than those indicated in the index.


Production and farm value Dec. 1 per bushel and total value, of total crop and of commercial crop, 1921, 1920, 1919: Dec. 1921, p.147.

Trends of monthly crop forecasts, for the years 1915-1921, inclusive, with averages for period 1915-1920: Nov. 1921, p.140.

Production of total crop and of commercial crop in five leading states, with per cent of U. S. crop, 1920; 1919, and 1918: Apr. 1921, p.41.

Dates when usual percentage of the apple crop is harvested, by states: Sept. 1920, p.100.


Area under fruit crops (including apples) in England and Wales in 1918: Mar. 1919, p.27.

Special regional apple report: Nov. 1918, p.138; July, 1918, p.81. Special commercial apple crop report, Aug. 1918 (by states); special regional report also: Aug. 1918, p.33.

Leading states in the production of staple crops (including commercial apples) 1916, 1917, and 1918: July, 1918, p.81.
Special apple report for early varieties, June, 1918: June, 1918, p.63.
Amount and value of exports of fresh apple, 1916 and 1917: Apr. 1918, p.36.
Disposition of apple crop (with amount and price per barrel) 1916 and 1915: April, 1917, p.63.
Apple production and f.o.b. harvest price per barrel, by varieties, 1916 and 1915: April, 1917, p.32.
Map showing apple production, 1915: Aug. 1916, p.81.

Prepared under the direction of Chas. F. Sarle and Charlotte M. Ward, Division of Crop and Livestock Estimates, U. S. Bureau of Agricultural Economics.
Following 5 pages of introductory matter are 63 tables of statistical data.

This contains data similar to that in Statistical Bulletin 14, Prices of Farm Products Received by Producers. 1. North Atlantic States.

"The statistics in this bulletin consist of shipments data by
States of origin on 9 important commodities—apples, cabbage, cantaloupes, celery, onions, peaches, potatoes, strawberries, and tomatoes—and car-lot unloads of these 9 commodities in 12 important markets, as follows: New York, Chicago, Philadelphia, Pittsburgh, St. Louis, Cincinnati, St. Paul, Minneapolis, Kansas City, Washington, Cleveland, and Detroit."—p. 1


Apples, potatoes, sweet potatoes, onions, cabbage, eggs, frozen eggs, poultry, butter, and fish.


Only tables containing statistics for years other than those published in later yearbooks are listed here: maps showing approximate trees of bearing, and non-bearing age, apple production, and amount of apples sold or to be sold— for the various states and total, 1919 (p. 464-465); production and farm price per bushel, Dec. 1, by states, for the years 1917-1921, inclusive (p. 625); estimated annual production of commercial crop, by states, 1917-1921, inclusive (p. 626); carlot shipments by states of origin, for the years 1917-1921, inclusive (p. 629); cold storage holdings, monthly (except for July-Sept., and for Oct. 1915-1918), 1915-1921 (p. 629); exports of dried and fresh apples by country of destination and per cent of total, for 1918, 1919, and 1920 (p. 760); labor and material requirements per acre, Wenatchee Valley, and Yakima Valley, Wash., Hood River, Oreg., Payette Valley, Idaho, Western Colo., and Western New York (p. 816); acre costs of production of apples, with yield per acre and percentage analysis of cost factors, for certain counties or sections in New York, Colorado, Idaho, Washington, Oregon, and Virginia (p. 827).


The following statistics relative to apples are included: production, and farm price per bushel, Dec. 1, by states for the years 1918-1922, inclusive (p. 730); estimated annual production of the commercial apple crop, by states for the years 1918-1922, inclusive (p. 731); total apple production, by states, and total crop for the years 1839-1922, inclusive (p. 731-733); forecasts of production, monthly, with preliminary and final estimates for the years 1915-1922, inclusive (p. 733); farm price per bushel on 1st of each month and yearly average, 1910-1922, also average 1913-1922, and extent and causes of yearly apple crop losses, for the years 1912-1921, inclusive (p. 733); monthly average jobbing prices per barrel and per box, at 10 markets, 1920/21, 1921/22, and 1922/23 (p. 734-735); monthly average wholesale prices per barrel at New York market, 1900/01-1922/23, and wholesale prices per barrel at New York market for Oct. 15, Jan. 1, and Mar. 1, 1881/82-1919/20 (p. 736); monthly and yearly carlot shipments by States of origin for the years 1917/18-1922/23 (p. 736-738); cold storage holdings on 1st of each month, 1915/16-1922/23 (p. 738); monthly and yearly carlot shipments of apples in the United States for 1917-1922, and average for 1917-21
(p.774); yearly unloads of apples at 10 markets in carlots, United States, 1917-1922, 5-year average for 1917-1921 (p.776); amount and value of dried and fresh apples exported, 1919, 1920, 1921 (p.958); exports of fresh apples, for the years 1900/01-1917/18, 1918-1921, inclusive, with averages for the years 1852-56, 1857-61, 1862-66, 1872-76, 1877-81, 1882-86, 1887-91, 1892-96, 1897-1901, 1902-06, 1907-1911, and 1912-16 (p.963); amount and per cent of total dried and fresh apples exports, by countries of destination, 1919, 1920, 1921 (p.972); production and farm value, Dec. 1 (per unit and total) for all apples, and commercial crop, 1920, 1921, 1922 (p.984); percentage of apples harvested monthly (p.988); statement showing rate changes from Jan. 1, 1900, to Jan. 1, 1923, in the 50 representative freight rates on agricultural products, also index numbers based on average of the year 1913 (p.1017); normal day's work per 10-hour day for pruning and spraying fruit trees and for various harvesting and marketing operations (p.1068-1070).


Only tables containing statistics for years other than those in the 1924 and 1925 Agriculture Yearbooks are listed here: condition of crops, lst of month, 1856-1923, averages for 1909-13 and 1914-20 (p.732); farm price per bushel lst of month, June 1910-Dec. 1924, with averages (p.735); monthly average jobbing prices per barrel and per box at 10 markets 1920/21-1923/24 (p.736-738); monthly average wholesale prices per barrel at New York 1900/01-1923/24, with averages for 1909-13 and 1914-20 (p.739); exports of fresh and dried apples, 1920/21, 1921/22, 1922/23, with per cent, by country of destination (p.1122); and production and farm value, Dec. 1 (per unit and total) for total crop and for commercial apples, 1921, 1922, and 1923 (p.1138).


Only tables containing statistics for years other than those in the 1925 Agriculture Yearbook are listed here: exports of green or ripe apples from the United States, total and by country of destination for the years 1899/1900-1923/24, inclusive (p.668); average l.c.l. price to jobbers at 10 markets, monthly during apple season, 1920-1924 (p.670-672); average l.c.l. price to jobbers per barrel at New York for Oct. 15, Jan. 1, and Mar. 1 of the years 1882-1924, and Oct. 15, 1881, averages for 1909-1913, and 1914-1920 (p.673); production and farm value, Dec. 1 (per unit and total) for California for the years 1919-1924, inclusive (p.677); amount and value of exports of dried and evaporated apples, fresh apples, and canned apples and apple sauce for the years 1921/22-1923/24 (preliminary), inclusive, (p.1043, 1044); and imports of fresh apples, 1922/23 (Oct.-June)-1923/24 (preliminary) (p.1061).


Fruits and vegetables are featured in this volume. These special sections have been analyzed elsewhere in this list under the authors'
In addition to these special sections tables containing apple statistics are found on pages 859-869, 945, 1258, 1266, 1267. They contain the following information: production of apples in the United States for the years 1909-1924, inclusive, with estimate for 1925; production by states for the years 1916-1924, inclusive, with estimate for 1925; percentage of summer, fall and winter varieties - commercial apple crop - by states, for the years 1923, 1924 and 1925, and the usual percentage; percentage reduction from full yield, from stated causes as reported by crop correspondents for the years 1912-1924, inclusive; carlot shipments by state of origin, June, 1920 - June, 1925; production of commercial apples, by states, for the years 1921-1925, inclusive; monthly and annual carlot shipments by state of origin, June, 1920 - Dec. 1925; imports and exports of principal countries, average 1911-1913, and for 1922, 1923 and 1924 (preliminary); estimated price per bushel received by producers, United States, 15th of each month from June, 1910 to Dec. 1925 - averages for 1910-1913 and 1914-1920; cold storage holdings, United States, for the years 1915-1925, inclusive and average for 1921-1925 (given by boxes and by barrels); average l. c. l. price to jobbers at nine markets, for months of market season, 1920-1925, inclusive - both range and average prices are given for September, October, April, and May of each year; average l. c. l. price per barrel to jobbers at New York, for months of September-December, 1909-1925 - averages for 1909-1913, 1914-1920; average l. c. l. price per barrel to jobbers at New York for Oct. 15, Jan. 1, and Mar. 1 for years 1909-1925, inclusive - average for 1909-13, 1914-20; unloads at 11 markets in carlots for the years 1920 to 1925, inclusive; exports of fresh apples for the years 1908/09-1924/25, inclusive, and exports of fresh and dried apples, by country of destination for the years 1922/23-1924/25, inclusive.

Pages 859-946 of this Yearbook are published as Yearbook Separate 921, with the title Statistics of Fruits and Vegetables. Pages 628-710 are published as Yearbook Separate 930, with the title, Marketing Fruits and Vegetables.


The Library, U. S. Bureau of Agricultural Economics has no report earlier than Dec. 1, 1917, but the market news service was extended to include apples in 1916.


Issued during season.

Daily market reports of perishable fruits and vegetables "are issued from permanent market stations located in 18 of the larger cities of the United States, including Washington, D. C., and from numerous temporary field stations in various producing areas during crop movement. They contain: 1. Telegraphic reports from many important markets giving the number of cars of each commodity received daily, the state of origin of these commodities, prevailing jobbing
prices, quality and condition of receipts, and marketing and weather conditions. 2. Telegraphic reports from all railroads handling the crops in question, giving shipments from each State up to midnight of the night before. 3. Numerous f.o.b. prices from representatives of the bureau in producing areas."—U. S. Dept. of agriculture. Bureau of agricultural economics. Division of economic information. Periodical reports, Feb. 1927, p.3-4.


Data are given for exports of fresh barreled and boxed apples and for dried apples from the United States.


This supersedes Amendment no.1 to Service and Regulatory Announcement no.85 which has the same title.


Title varies.


"During the 1922-23 season the Bureau of Agricultural Economics collected data from 13 fruit shipping organizations located in the
Okanogan, Spokane, Wenatchee, and Yakima districts of the State of Washington. In addition to the data collected in the producing areas, jobbing and retail prices were collected in the New York Port District. The results obtained from partial tabulation of this information form the subject of this preliminary report."—p.1.

Under the main subject, Analysis of the retail price of Winesap apples sold through unit grocery stores in New York Port District, the following subjects are discussed: retail margin, jobber's margin, wholesaler's margin, transportation charges, shipping organization margin, grower's portion per packed box, shipping organization expenses, labor and supply expenses, and joint expense per box. Tables and a chart are included.


Following comments regarding the apple situation in the various states there are two tables showing percentages of commercial apple crop of summer, fall and winter varieties, by states, 1923, 1924, 1925, and usual percentage; and the December estimates of 1923 and 1924, with the 1925 forecast from condition Aug. 1., of production, by states.


Colorado apple deal, season 1923. Summary by W. J. Bertush, 1924.

Western Colorado apple deal, season 1924. Summary by R. L. Sutton, 1925.


Western New York apple deal, season 1924-1925. Summary by A. E. Prugh, 1925.

Marketing Western New York apples (season 1925-1926) Review by A. E. Prugh. 1926. New York State Dept. of Farms and Markets coop-
erating.
These mimeographed reports contain various kinds of statistics, such as estimated production of apples (total and commercial), car-lot shipments, prices, carlot arrivals, exports, cold storage holdings, freight rates, and carlot unloads. Every report does not contain all of the information noted. The later reports are more complete.

532. U. S. Dept. of agriculture. Bureau of agricultural economics. Division of fruits and vegetables. Summary of carlot shipments of important fruits and vegetables in California, Arizona and Nevada, 1925, by billing stations and including both interstate and intrastate shipments as reported by mail and telegraph by the common carriers. By Homer A. Harris and Opal V. Yeoman. Los Angeles, 1925. 87p. Mimeographed. 1.9 Ec741S
Data on apples are to be found on pages [3-7]. Statistics on dried apples are given also. Monthly and annual shipments are for the year 1925 [i.e. 1926] Annual figures are also given for 1923 and 1924.

Reports are given for numerous cities for the years 1918-1926, but there is not a report for every city each year. These annual summaries contain monthly summaries also.

Reports on unloads of apples have been issued for the years 1922-1925.
Monthly and quarterly reports are also issued.

Discusses supply and market, waste and losses, prices, supply of varieties, exports, and cold storage holdings, and contains numerous statistics.
A graph illustrates prices of American Baldwins in British markets, 1923/24-1925/26. Tables show prices of American apples, Liverpool auction, Oct. 6 and 13, 1926; commercial apple production, 1925, 5-year average and forecasts for 1926; production, exports from U. S. and from Canada, cold storage holdings, Dec. 1, and carlot shipments (seasonal) for the years 1917-1925, inclusive, with some figures for 1926; prices of various kinds; carlot shipments of apples, recent and comparative; and carlot shipments by states of origin for the seasons of 1921, 1922, 1923, 1924, and 1925.


In other years title varies slightly.

May 22, 1917 is first number published.


In early issues title varies slightly.

"The total number of cars shipped from leading States, by weeks and shipping seasons, as reported telegraphically daily to this bureau by transportation companies is given in this summary. Monthly summaries of shipments are published in Crops and Markets."-U. S. Dept. of agriculture. Bureau of agricultural economics. Division of economic information. Periodical reports ... Feb. 1927, p. 4.

Apples are included in the fruits for which shipments are given.


The Library, U. S. Bureau of Agricultural Economics, has July-Sept., Nov.-Dec. 1913; June-Dec. 1919. A more complete collection containing some reports for 1916 is filed in the Special Study File, Crop Reporting Board Room.

Some of these reports were published in the Monthly Crop Reporter.

They contain forecasts of the condition and production of the commercial crop with final figures for the previous year, by states, and a report by regions and comments on the crop, by states. The Nov. 1919 report contains a statement giving per cent of crop still in growers' hands, by states.

Contains: Holdings of apples, dairy and poultry products, lard, meat, fish, and squid.


Discusses producing areas, packages, grades, preparation of certificate, condition of pack, size, color and maturity, varieties, insect injuries, diseases, and mechanical injuries.


Discusses producing areas and varieties, package, the inspection certificate, pack, color and maturity, diseases and decay, insect injuries, and miscellaneous blemishes.


The appendix contains three tables showing the quantity and value of fruits and vegetables imported into the United Kingdom in 1920, by country of origin; approximate value of produce grown in England and Wales; and names of principal fruits sold in the United Kingdom, the country of origin, and the season during which the produce is on the market.


Continued as Agricultural Outlook.

Some volumes are indexed.
This monthly publication contains the following statistics which include data on apples: amount and value of domestic exports for the calendar year and for the fiscal year ended June 30; monthly reports on condition of crops; and beginning with the Jan., 1910 issue, the farm value (price paid to grower) on 15th of each month is given for apples (this is usually given for the United States, but occasionally for individual states; comparative figures are usually given, also).

In addition to these the following have been noted: production of apples, 1899 and 1909 and value 1909, United States (census figures), Jan., 1913, p.8; per capita production of apples, census years, 1890 and 1900, Nov., 1909, p. 79; article on The export apple trade of the United States (with statistics), Nov., 1903, p.52-53; article on Apples in the United Kingdom (with statistics), Jan., 1901, p.3.

There is an index to table 5 on p.65-66.
Average export values of fresh apples per barrel, 1851-1908, years ending June 30, dried apples per pound 1864-1908, years ending June 30: p.15, table 3.
Quantity and value of exports of dried apples: 1864-1908, years ending June 30; for fresh apples 1851-1903, years ending June 30.

Consists of a statement as to the distribution of apple shipments from Oregon, Washington, Idaho, and Montana. Statistics given are for cities in each state.

Quantity and value of exports of dried and evaporated apples from the United States, 1922, 1923, 1924, and 1925: p.247, table 82.

"The yearly exports and average annual prices of dried and green or ripe apples are given for the period of 1913-1919, inclusive, also the variations in quantity, value, and average price in the export trade monthly during 1919, and the distribution of the exports by principal countries during November and December and for the calendar year 1919....
"A brief history of the export prices from 1791 to January, 1920, is given: imports of green and dried apples for the first three-quarte
of 1919 are shown; and the domestic production, the leading apple-producing sections, and the varieties produced in different regions are described."—Exp. Sta. Record, v.43, p.39.

560. U. S. Food administration. Schedule of maximum cold storage rates, effective December 1, 1913 ... Cold storage warehouse licenses. [Washington?] 1918. 7p. 164.1M452

"This pamphlet supersedes the pamphlet issued on September 1, 1918."—Title page.

Gives rates for apples and pears, butter and poultry, cheese, dried fruits, and meats.


The apple transportation situation in the chief producing districts of Washington, Oregon and Idaho is reported on: p.3-7.


"This bulletin, dealing with the prices of fruits, nuts, and wine from 1913 through 1918, is one of 50 similar studies of wartime prices in different industries. The aim of these studies is to make the data gathered by various Government agencies available in convenient form to men concerned with problems of business readjustment and also to provide a permanent record of the striking changes in prices which accompanied the world war."—Introduction.

Graph showing relative prices of apples — average price paid to farmers, monthly, Jan., 1913 to Dec., 1918: p.8.


Table showing production and imports of apples, dried apples, and other fruits, 1917: p.14.


"This report contains a statistical account of the nursery and fruit industry in Utah for 1913 and 1914, together with an account of factory inspection and quarantine work, including a brief statement of quarantine measures in adjacent states. In addition to statistics on fruit trees planted in 1913 and 1914, data are given of an orchard survey including some 727 blocks of fruit on 357 farms. The various fruits are classified both with reference to age and acreage and conditions with reference to spraying, cultivation, and pruning. A report is also included relative to the possibilities for fruit product factories in Utah, together with a paper on diversified fruit growing by W. W. Knudson ... The data given include
the varieties of fruit grown, time of harvest, receipts, and expenses for the three years, 1912-1914. The report concludes with a list of nursery licenses and a financial statement for the bi-ennial period."-Exp. Sta. Record, v.33, p.638.
Apples are included.


In this report the author gives statistics showing estimated yield of apples in New York and in Washington for the years 1911-1921, inclusive, compared with yield in United States for the same years; Census figures on number of bearing and non-bearing trees, 1900, and 1910, in Washington, New York, and Virginia; and carlot shipments of boxed and barreled apples in New York, months of September, October, November, and December, 1921.

565. Virginia. Dept. of agriculture, Division of markets. List of Virginia apple growers reporting one car or more of commercial fruit; secured and comp. by ... L. W. Wilson ... and W. P. Massey ... [Richmond, Aug. 10, 1918] 10p. 225 V

"Published by Division of markets, Virginia Department of agriculture and Bureau of markets, U. S. Department of agriculture cooperating."

Consists of a list of the fruit growers of Virginia with their post-office and shipping point addresses and the number of barrels of each variety each grower has for sale.


Consists of a "report on the condition and size of the commercial apple crop in the United States for the season of 1918 [which] has been secured and compiled by the Division of Markets of the Virginia Department of Agriculture and the State Horticultural Society from information secured from a large list of reliable fruit growers throughout the country."-p.9.

Production for 1917 and 1918 is given by regions.


"The purpose of this bulletin is to state the present methods of practice in the growth and marketing of apples, as well as to point out some of the principles which underlie successful culture, which, if observed, will result in greater returns to the grower."-p.3.

Lists of varieties: p.3-9.

569. Vroom, G. H. Apple from tree to market. (In New Hampshire Agriculture
Contains a table giving itemized costs per barrel.

"A paper on this subject in which the author outlines the present status of apple growing in the Ozark region, and makes an appeal for more thorough orchard management, suggestions being given relative to methods of cultivation, pruning, spraying, packing, and marketing."-Exp. Sta. Record, v. 22, p. 241.


Consists of a detailed table of "cost of growing the crop on seven acres of apples, Duchess and Wealthies, three hundred seventeen year-old trees" and discussion.

Thesis (Ph.D.)—Cornell University.
Reprint from Bulletins 226 and 229 of the Agricultural Experiment Station, Cornell University.

"This Bulletin is a supplement to Bulletin 226, 'The Apple Orchard Survey of Wayne County', which discussed apple-growing in both counties, the conclusions in it being based on observations made in both counties and on the statistics gathered from Wayne County. In this Bulletin the tables from Orleans county are presented, but the discussions are not repeated except when new or contradictory conditions are shown."-p.463.
It contains statistics very similar to Bulletin 226, the following are noted here: approximate yield for the entire county, 1889, 1899-1904, inclusive; average yield per acre, 1899-1904, inclusive; (number of orchards and acres are given for 1900-1904, inclusive); average yield per tree, 1899-1904, inclusive; classification of yields, 1900-1904, inclusive; how the crop is marketed, average price paid to grower, average gross income per acre, and classification of incomes, for the years 1900-1904, inclusive.

Tables 16-18 contain data on apples and other farm products as follows: prices paid to producers of farm products in New York as
reported by the U. S. Dept. of Agriculture, monthly, Jan. 1910-Dec. 1922, with yearly averages and 5-year average, 1910-1914; and index numbers of prices paid to producers of farm products in New York, monthly, Jan. 1910-Dec. 1922, with yearly averages.


Table XVII gives prices paid to producers of farm products in the United States, monthly, Aug. 1909-July, 1921, with yearly averages. (Includes apples)

Table XIX gives purchasing power of farm products at prices paid to producers in the United States, for the same period. (Includes apples)


"Bulletins for apple-growers": p. 361-362.

This is a very comprehensive bulletin covering many phases of the subject. There are numerous tables of statistics. These contain information relative to the population and the value of orchard products, with per cent of increase, in the United States, for 1850, 1860, 1870, 1880, 1900; value of orchard products, and all fruits of the 10 leading fruit-producing states, and the leading New York fruit counties, 1900, with relative rank of the states and counties; number of bearing trees, 1890 and 1900 and production of apples, 1889 and 1899 for the 10 leading fruit states and 10 leading New York fruit counties; pounds of dried and evaporated fruit produced in the United States, and in each of these states - California, New York, Oregon, North Carolina - and Tennessee and in each of 5 New York counties, 1899; value of orchard products for each state from the census reports, 1850, 1870, 1879, 1900; amount and value and average price of apples exported from the United States for the years 1851-1868, 1870-1904, inclusive; with averages (same information is given for dried apples for the years 1864-1869, 1870-1904, inclusive) relation of yields to methods of tillage and to fertilizers used and to spraying (average price of sprayed and unsprayed apples in 1903 is also given); cost of renovating an orchard in 1903; number of trees per acre, distance between trees, and yield; age of trees and yield per acre for the years, 1900-1903, inclusive, with average; soils and yields; number of orchards owned and rented, with acreage and yields; approximate yield for the county, 1899, 1900, 1901, 1902; average yield per acre and per tree, 1899, 1900, 1901 and 1902, and average yield per acre and acreage for 1903; average number of bushels raised by each grower in Walworth, 1900, 1901 and 1902; variation in yields of orchards; distribution of the crop, 1900, 1901, 1902, 1903; average price paid for apples to evaporate, 1900, 1901, 1902 and 1903; average price per barrel, 1902 and 1903; and average income per acre, 1900, 1901 and 1902.

Pages 330, 332 deal with varieties.

Running title is Bulletin.

Bibliographical footnotes.

This is a very comprehensive survey of the situation. The subject is discussed under the following headings: incomes of fruit farmers on farms in a western New York fruit region; labor incomes on Newfane farms compared with those on other areas in New York state; cost-accounting results on a few unusually successful fruit farms; prices received by growers for apples; city wholesale prices of apples; production (total and commercial) of apples; number of apple trees; carlot shipments; per-capita supply of apples and other fruits; progress in the drying and canning of fruits and apples in the United States, and in New York state; production of vinegar and cider; distribution of New York apples; exports of domestic fresh, dried, and canned fruits, costs of marketing New York apples; and consumers' preferences for types and varieties of apples.

49 tables illustrate these various phases of the subject.


Orchard tree census: p. 37-112.

Statistics give number and age of apple, crab-apple, peach, plum and prune, apricot, and cherry trees by varieties for certain counties and for districts of the state. Number of acres of grapes, bush fruits, and strawberries is also given. This census was begun in the fall of 1917.

There is another table which gives number of the various kinds of fruit trees from 1912 records for 14 counties of the state.


582. Waugh, F. A. The American apple orchard; a sketch of the practice of apple growing in North America at the beginning of the twentieth century. N. Y., Orange Judd co., 1908. 215p. 93 w358A


This bulletin discusses methods of cultivation, spraying, favorite varieties, picking, storing and marketing, and storage houses. The number of growers reported, number of bearing trees and trees too young to bear, and production, in 1896, are given for 5 towns in the county. The expense account of one grower's 20-acre orchard is also given.
534. Waugh, F. A. Packing and marketing fruits; how fruits should be handled to carry to market in best condition and present most attractive appearance. St. Joseph, Mo., The Fruit-grower company, 1905, 63p. ("Brother Jonathan series"-no. 5) 93 W352p

Includes information on picking, sorting, packing, and storage of apples, and apple barrels and boxes.


In addition to practical suggestions for cultivation, spraying, etc., and a short list of favorite varieties there is one statistical table which gives the number of bearing trees, and production in 1900 and 1901 for the county and towns in the county.


The period covered is Sept., 1923 to June, 1924. The bulletin contains a number of tables and charts. Apples are included in the commodities reported on.


"This circular is intended as a supplement to Circular 101, and presents the detailed results of the peach and apple tree survey by counties. Figures relating to the number of trees in commercial orchards by varieties and ages are given in the following tables ... The figures in this circular ... do not represent the totals for all peach and apple orchards in the counties, but are merely the totals for orchards for one hundred or more trees that were reported during the survey."-Introduction.


"Presents the results of the peach and apple tree survey made during the fall of 1925 and winter of 1926 by the State Department of Agriculture, Bureau of Agricultural Economics, United States Department of Agriculture, and the State Horticultural Society. Results were obtained by the questionnaire method and by personal visits, and credit is due to the fruit growers of New Jersey for their splendid cooperation."-p. 2.

Pages 8-11 contain data relative to the number, age and variety of apple trees in the various counties reporting.


"The results are given of a joint survey conducted by the New Jersey Bureau of Markets and of Statistics and Inspection. The data given for both the apple and peach show the location of the producing districts, the number of bearing and nonbearing trees, and the varieties and ages of bearing and nonbearing trees. Summarized data relative to the apple and peach industries in the United States as a whole and in the principal producing States of the East are also
included,


The writer discusses overproduction, standardization, enforcement of purpose of and difficulties in the enforcement of the law, and cooperation between the northwestern states. There is included a chart illustrating requirements of the apple standardization act of 1917.

591. Wenatchee Valley traffic association. [Sheets containing production costs of boxed apples in the Wenatchee District]

The Library, U. S. Bureau of Agricultural Economics has 5 sheets. One sheet gives detailed labor and material costs per acre and per box, 1922 and 1923; another gives detailed general expense and fixed charges and summary costs per acre and per box, 1922 and 1923; another compares costs with other data (number of cars and boxes shipped, average production per tree and per acre, and average cost per box, 1922 and 1923); the fourth gives average yield per acre of trees of bearing age and cost of growing and harvesting on average yield per acre, annually 1912-1923, inclusive; and the fifth summarizes costs per box and per acre for the period 1912-1915, and annually from 1916 to 1921, inclusive.


U. S. Dept. of Agriculture, Bureau of Agricultural Economics cooperating. Tables give statistics relative to the number of apple orchards, acreage, total number of trees and number of summer and winter varieties of apple trees by counties; age of trees in commercial apple orchards (summer and winter varieties) by counties; percentage of varieties in commercial apple orchards, by counties; commercial summer and winter apple production, by counties, 1923, 1922 and 1921; number of orchards, acreage, number of trees, number and per cent of summer and winter varieties of trees, age of trees, and percentage of varieties in commercial orchards are given for counties by varieties. Somewhat similar information is given for peaches and grapes. The number of trees in commercial pear, plum, cherry, and quince orchards is also given. Census figures for 1925 are given for the number of apple and peach trees in the state and in each county.


"References": p. 47-48.

"It is the purpose of this bulletin to report the results of our experiments on orchard heating, to answer the question as to the conditions under which artificial heating would be financially

595. When crops are usually harvested in Alabama. (In Alabama Markets Journal, v.3, no.11, Aug. 1919) Contains a table which shows the percentage of each crop named (including apples) usually harvested in the various months in Alabama.


598. Whitehouse, W. E. Cold storage for Iowa apples. Third progress report. Ames, 1919. p.179-216. (Iowa. Agr. Exp. Sta. Bul. 192) Bibliography: p.214. This bulletin "covers work which has been in progress during the past five years and deals with several questions: The temperature of fruit before and after storing; humidity of storage rooms; maturity of fruit when stored; size of apples; wrapping paper used in packing, and methods of storing; the control of certain apple rots which are liable to develop in storage, and the rate of cooling of apples when put into cold storage."


The appendix contains tables (after H. B. Knapp, Ithaca, N. Y.) which give average prices of varieties by months, 1893-94 to 1902-03, 1903-04 to 1912-1913; average price of apples in New York, monthly from 1893/94 to 1912/13; high, low, and average prices by months of winter apples in New York, for 20-year period; monthly and yearly receipts in New York City, 1893/94-1912/13; carlot shipments of apples on N. Y. Central and Hudson River R. R. from the Western N. Y. State fruit belt in 1909; and a chart showing preferences of different U. S. markets for various apple varieties.


The author "discusses the box and box material, lining, layer and wrapping paper, the packing table, the box press, packing, and varieties suitable for packing in box or barrel. A plan and detailed specifications are given for the use and construction of a box press." Exp. Sta. Record, v.25, p.644.


"Submitted as a major thesis to the faculty of the Graduate Division of the University of California, May, 1921, in partial fulfillment of the requirements for the degree of doctor of philosophy."

"Literature cited": p.139-190.


Not examined.

606. Wisconsin. Laws, statutes, etc. The apple grading law. 1917. 8 p. 93 W. Pam.Coll.

Act approved June 26, 1917.


The text of the law is given on p.46-51.


"In addition to a technical account of methods of packing apples
in barrels and boxes, the author reviews the legal measures which have been taken in this country to regulate the grading and packing of apples. The text of the United States apple grading law and the Massachusetts apple packing and grading law is appended." - Exp. Sta. Record, v. 35, p. 338.


Discussion: p. 65-74.


The authors discuss the history and present status of Indiana apple growing, the young orchard, orchard management, varieties for successful planting, pruning, harvesting and packing, spraying and renewal of old orchards.

There is a table on p. 22 giving freight rates on apples in car lots from various points in the United States to Chicago, New York, and other markets.

Pages 122-124 contain short lists of seed firms handling cover-crop seed, apple package firms, commission firms, cold storage firms, and horticultural organizations in Indiana.


"It is the purpose of this bulletin to discuss in a popular way the conditions of success in the renovation and operation of farm orchards; to outline the conditions underlying successful fruit growing in such a way as will enable orchard owners to form a correct judgment in regard to their own opportunities and to present figures on operation costs in several farm orchards which have been summarized from records compiled during the last five years." - p. 3.

Costs of pruning, cultivation, spraying, fertilizing, harvesting and packing, and total management costs are tabulated.

Total yield, yield per acre and per tree for the years 1911-1915 are given for certain orchards.


Survey made in cooperation with the Bureau of Agricultural Economics, U. S. Dept. of Agriculture.

Table 1, p. 9, shows amount and estimated value of purchases of agricultural products (apples, eggs, chickens, turkeys, potatoes, etc.) in New Hampshire by retail stores, hotels and camps from
farmers and from others in 1925 during competing and non-competing seasons.

Apples: p. 33-35. This section contains tables showing amount of apples purchased in bushels by retail stores, hotels, and camps from farmers and others (by districts) in 1925; carlot shipments of apples from New Hampshire, 1920, 1921, 1922, and 1923; and amount of apples purchased by various cities from farmers and others and per cent purchased from farmers.

Table XVI, p. 40, gives amount of various agricultural commodities purchased from local farmers, 1925, and from others, weekly, 1925.

Table XVIII, p. 46-47 gives amount of various agricultural commodities in 15 New Hampshire cities and towns purchased by retail stores from farmers and from others in 1925.

Bibliography: p. 35.
The subject matter of the bulletin is divided under three heads, preparation, transportation, and disposition. The bulletin is of a general nature, but apples are mentioned.

"This contains popular instructions for handling apples intended for storage. A list is also given of a number of varieties of apples showing their customary behavior under storage conditions."—Exp. Sta. Record, v. 32, p. 141.

Packing apples, by Chas. A. Cole: p. 175-183.
Organization for marketing apples, by H. C. Atwell: p. 184-196.

617. Youngers, Peter, jr. The keeping qualities of winter apples. (In Colo. State board of horticulture. Rept. 10th, 1898, p. 39-40) 81 C71
Results are tabulated to show the condition of different varieties at different times:

"The method employed ... was a personal interview with each owner of a commercial orchard ..."
"Cooperating with the Department of Agricultural Economics of the Massachusetts Experiment Station in securing this information, was the State Department of Agriculture ... [and] the New England Research Council..."
This bulletin, which contains numerous charts and tables, treats
of the following phases of the apple industry in Massachusetts: producing regions, number and age of trees, fillers, principal varieties, size of bearing orchard, sources of income, orchard practice, production, marketing, prices, markets, exports, storage, transportation, and the future of the industry.

VARIETIES

"This is a compiled list based on the personal observations of the author, and supplemented by a consensus of the best experience gathered from State growers. It includes such old standard varieties and promising newer sorts as it is thought will be of value for planting orchards throughout the State. The list includes 17 varieties of apples, 11 pears, 4 quinces, 21 peaches, 12 plums, 10 cherries, 3 blackberries, 6 raspberries, 5 currants, 3 gooseberries, 11 strawberries, and 12 varieties of grapes."-Exp. Sta. Record, v.12 p.151.

"This is an alphabetically arranged catalogue of 416 varieties of apples, crab apples, pears, and quinces grown at the Station during the past 14 years. 'It has been carefully prepared to conform to correct nomenclature and spelling.' It is stated that the Station is prepared to furnish scions true to name, for purposes of study, etc., of such varieties as are in the orchard."-Exp. Sta. Record, v.14 p.660.

Consists of a discussion of 32 varieties of apples growing on the station grounds.

Apple list: p.43. Virginia Agricultural Experiment Station Bulletins 99 and 100 are Orchard Technique III and IV; Growing the Orchard, and Spraying the Orchard.

"This bulletin describes 13 varieties of crab apples and gives critical notes on their culture and quality, based on 14 years' work with fruits at the station."-Exp. Sta. Record, v.15 p.153.

"The author here presents data showing the relative production of the principal varieties of apples in the United States as a whole and in each of the important apple-producing States. The production is expressed as percentages of a normal crop of all apples. A table is also given showing the estimated approximate average annual production of leading varieties of apples by the principal States covering the period 1909 to 1913. The data are based upon replies received by the Bureau of Crop Estimates from 2,622 correspondents."-Exp. Sta. Record, v. 32, p. 439.


"Sources of additional information": p. 47-48.

"Based largely upon results obtained at the United States Northern Great Plains Field Station, Mandan, N. Dak."

Kinds and varieties of fruits: p. 30-43. (Apples and crabapples on p. 32-34)


"The author directs attention to the valuable qualities of this apple variety, pointing out the similarity to Rome Beauty in tree and fruit characters. In his opinion, Ensee surpasses Rome Beauty in quality of fruit and in value as a storage apple."-Exp. Sta. Record, v. 44, p. 741.


628. Beach, S. A. The apples of New York, by S. A. Beach ... assisted by N. O. Booth ... and O. M. Taylor. Albany, J. B. Lyon company, printers, 1905. 2v. (Report of the New York Agricultural Experiment Station for the year 1903, II)

The name of the Department of Agriculture, State of New York, appears on the title page.

"Authorities cited and abbreviations used": v. 1, p. XVII-XX.

"A comprehensive account of the apples grown in New York, including notes on the botanical classification of apples, the origin and development of apple culture in New York, the adaptation of varieties to particular regions, and a discussion of what a variety is, with technical descriptions of all of the varieties of winter apples grown in New York and an account of their commercial importance ... On account of its completeness this report should prove of unusual value to orchardists. It is attractively and substantially bound and the numerous half-tone and colored plates serve a distinctly useful purpose in the determination of varieties."-Exp. Sta. Record, v. 17, p. 559.
A brief account (historical and descriptive) of this seedling apple.

630. Beach, S. A. New varieties of fruit not yet generally introduced. (In Western N. Y. horticultural soc. Proc. 45th, 1900, p.34-41) 81 W52P
"Notes on the quality and character of 12 varieties of apples, 2 of Japanese plums, 2 of grapes, and 2 of Domestica plums, as yet little grown."-Exp. Sta. Record, v.12, p.54.

"A historical account is given of early orcharding in New York and of the introduction of Russian varieties and of the varieties of fruits that are now in the lead in New York."-Exp. Sta. Record, v.17, p.41.

"Some remarks are made upon the necessity for careful testing of varieties for culture in the State, and a list given of 130 varieties growing from scions in an orchard under station control."-Exp. Sta. Record, v.8, p.496.

"The purpose of this publication is to familiarize consumers and wholesale and retail fruit dealers in New Jersey with the leading varieties of winter apples grown in the state."
On page 3 there is given also the total number of trees of varieties of apples found in commercial orchards by a census taken during 1925/26.

"In this circular lists are given of varieties of apples, peaches, pears, cherries, plums, and quinces that are adapted for the home orchard and for commercial planting in New Jersey. Suggestions are also given relative to age and size of trees to plant and time of planting."-Exp. Sta. Record, v.33, p.439.

"A descriptive list is given of the varieties of apples, crabapples, pears, quinces, peaches, plums, cherries, grapes, blackberries, dewberries, loganberries, raspberries, strawberries, and gooseberries, which have been tested by growers in Oklahoma. The number of grower who have been successful and those who have been unsuccessful with each variety are indicated."-Exp. Sta. Record, v.27, p.241.

"This bulletin is intended primarily for 'the guidance of the farmer in the propagation, cultivation, and care of the family orchard.' Lists of varieties of apples suitable for culture in different sections of the country are given, and these lists include many commercial varieties suitable for the same districts. Utilization of orchard fruits and the gathering and disposing of the crops are also discussed."-Exp. Sta. Record, v.12, p.245.


Apples: p.6-9.


Includes a list of varieties of Russian apples, American apples of North German and Russian parentage, and American seedlings of unknown parentage in the oldest experimental orchard at the station.


Apples: p.325-335. This list "only includes varieties now in nursery which have been tested over the west and northwest since 1883."


"A brief history is given of the orchard of the university from 1869; remarks upon pests, soil treatment, life of trees, and identity of varieties; descriptions of 18 varieties which have given most
promise of usefulness and of 550 varieties (including synonyms) which have fruited on the station farm, and a list of 304 trees which were planted but did not live to bear fruit."—Exp. Sta. Record, v. 8, p. 494.

"Descriptions with illustrations are given of 6 varieties of apples of recent introduction and 5 Russian apples."—Exp. Sta. Record, v. 8, p. 791.

"New apples": p. 9.

Apples (descriptive notes on some varieties): p. 107-111.

647. California. Agricultural experiment station. Fruit tree catalogue. List of varieties represented January 1, 1894, in the orchards of the five experiment stations. (In its Report for the year 1892/93 and part of 1894, p. 474-490)

"A new key for the identification of apple varieties is offered, based on a few prominent characters, such as flavor, form, shape of the cross section, skin color, flesh color, and the tufting of the carpels."—Exp. Sta. Record, v. 52, p. 141.

"This comprises descriptions of Missouri's most important varieties of apples. The material is compiled principally from The Apples of New York... only such changes having been made as were deemed necessary to adapt the subject matter to Missouri conditions."—Exp. Sta. Record, v. 27, p. 844.

Not examined.

651. Cobb, M. A. Apple varieties. 1912. 12 p. (Central state normal school [Mich.] Bul. 19, no. 4)
"This agricultural bulletin for teachers is designed to arouse
an interest in apple varieties and to explain how they are recognized or described. Rules are given for ordering varieties for an orchard."-Exp. Sta. Record, v.31, p.494. Not examined.


654. Craig, John. Types of fruit and their persistence under cultivation. (In Gardening, v.7, no.162, June 1, 1899, p.278, 279) 80 G166 "Especially illustrated by the Borsdorf apple, a variety that has been in cultivation for upward of 400 years. The variety is figured and notes are given on its history and synonymy."-Exp. Sta. Record, v.11, p.152.


659. Dumas, J. L. Varieties of apples. (In Wash. state horticultural assoc. Rept. 8th, 1912, p.18-31) 81 W273 "This comprises suggestions to the revision committee of the American Pomological Society relative to the description and classification of apples recommended for commercial orchards in the United States and Canada. A chart comprising tentative descriptions of 49 varieties is here presented and discussed."-Exp. Sta. Record, v.28, p.237.
Deals with the production records made by this apple in the sta-
tion orchard.

661. Ellenwood, C. W.  Fruits of unusual excellence; the Mother apple.  (In 
A comprehensive description of the Mother apple.

662. Elliott, F. R.  Popular varieties of the apple, pear, and grape.  (In 
U. S. Dept. agr. Rept. 1863, p.119-130)  
This is a continuation of an article in the 1862 Report entitled 
Descriptions of Leading Popular Varieties of the Apple and Pear.

Bul. 20, p.98-104)  
Lists of varieties of apples and crab apples being tested at the 
station are found on p.98-99, 100.

664. Erwin, A. T., and Bliss, G. R.  Establishing the apple orchard.  Ames, 
Ext. bul. 5)  
Discusses planting, preparation of the ground, tillage, etc. 
Selection of varieties: p.22-27.

665. Faurot, F. W.  Varieties of apples for the home orchard.  Mountain Grove, 
1913.  8p.  (Mo. State Fruit Exp. Sta. Circ. 12)  
"A descriptive list of apples, including also lists of crab apples 
and pears adapted for planting in Missouri."-Exp. Sta. Record, v.40, 
p.341.

Agr. Exp. Sta. Bul. 44)  
Contains a list of varieties (including crabapples) suitable for 
various sections of Montana.

667. Fitz, James.  The southern apple and peach culturist ... containing full 
and practical instructions ... with descriptive catalogues of the most 
esteeled orchard fruits...  Also a treatise on insects and their ex-
termination ...  J. W. Fitz, editor.  Richmond, Va., J. W. Randolph & 
English, 1872.  336p.  9S F57S  
Southern and western apples - revised catalogue.  (Selected from 
the catalogue of the Committee of revision, presented and accepted 
at the meeting of the American Pomological Society, held at Richmond, 

668. Fletcher, S. W.  Varieties of fruit originated in Michigan.  East Lansing, 
"This bulletin contains descriptions of 185 named varieties of 
orchard and small fruits, which have originated in Michigan and have 
been announced from time to time in the horticultural literature of 
This list of varieties of grapes, berries, apples, crabapples, plums and hybrid plums, ornamental fruiting shrubs and nut fruits is the list revised and adopted by the Minnesota State Horticultural Society, November 11, 1926.

670. Gardner, V. R. Apple varieties for Missouri; or "the lesson of the last one hundred years regarding apple varieties." (In Mo. State board of agr. Bul. v.17, no.5, May, 1919, p.8-16)
Includes discussion on the article.

"The purpose of the investigation, which this bulletin reports, has been to make a rather careful analysis of the apple variety problem in Michigan, in the hope that definite, specific answers could be obtained to the following questions: (1) What varieties do the commercial orchards of bearing age actually contain and what are the relative numbers of these varieties of different ages? (2) What varieties are now being set in commercial plantings and in what relative numbers? (3) What average prices are being obtained for fruit of different grades of these varieties? (4) How does the fruit of these different varieties, as ordinarily grown in the commercial orchards of the state, grade out? (5) How do trees of different ages of these different varieties yield? (6) Finally, what are the average returns per tree and per acre for each of the more common varieties of different ages?"-p.3-4.

672. Gardner, V. R. Varieties of fruits for various localities. (In Oregon Countryman, v.11, no.2, Nov. 1918, p.18-21) 6 Or33
"A list of varieties of orchard and small fruits and grapes recommended for different sections of Oregon."-Exp. Sta. Record, v.41, p.444.

"An historical and descriptive account is given of an apple grown in the orchard of O. Piper, of Clinton, Hickman County, Ky., and named by him the Fall Beauty. The description is accompanied by plate illustrations of the fruit."-Exp. Sta. Record, v.16, p.1079.

"This is a catalogue of all of the fruits and nuts grown in Georgia with estimates as to their value in different localities, season of ripening, etc."-Exp. Sta. Record, v.15, p.675.


676. Gibb, Charles. On the Russian apple imported by U. S. Department of agri-
culture in 1870. Montreal, Printed by the Gazette printing company, 1884. 67p.
"Being a paper from the ninth report of the Montreal Horticultural Society."


   Varieties: p.18-23.

   There is an index on p.97-102.
   "This is the first report on a series of fruit district investigations which the Bureau of Plant Industry is conducting. It discusses the physical and climatic conditions of the Piedmont and Blue Ridge regions and contains notes on the range and behavior of a large number of varieties of apples, pears, peaches and plums grown therein. The varieties of apples and peaches are also grouped according to their behavior at different altitudes in different latitudes, and phenological records compiled from the observations made of some of the more important varieties of fruits by a large number of fruit growers are given. The text is accompanied with a map showing the pomological regions of the South Atlantic States."-Exp. Sta. Record, v.20, p.641.

   Discussion: p.78-81.

   Apples are included.

   Consists mainly of descriptive accounts of certain varieties of apples.

   "Descriptions and notes on apples": p.13-31.

   Contains a list of varieties suitable for certain purposes.
685. Green, W. J. Varieties of apples for Ohio. 1912. 11p. (Ohio, State univ. Agr. col. Farmers' reading course, v.1, 1912, no.3)


The titles vary somewhat in these bulletins.

"This bulletin includes varietal lists prepared by the station of apples, pears, plums, peaches, cherries, and small fruits recommended for culture in Ohio. The selection of the varieties here suggested for culture is based upon experience covering 25 years in the station orchard, in orchards of cooperators and on observation and study of horticultural problems in various sections of the State."-Exp. Sta. Record, v.37, p.241-242.

"This bulletin contains full horticultural descriptions of the important new or little-known varieties of apples, together with briefer descriptions of the well-known varieties and those of minor importance."-Exp. Sta. Record, v.35, p.47.

"A general discussion of apple culture in the Georgia mountains, including a descriptive list of native Georgia apples."-Exp. Sta. Record, v.27, p.644.

This contains a short list of apple, peach, and pear varieties recommended for "commercial plantings of growers producing fruit for the general market."

"This bulletin discusses methods of propagating apples and of originating new varieties, best varieties of orchard and small fruits for planting in the Northwest, and the terms used in describing apples;
and gives descriptions of more than 300 varieties of apples, including notes on their origin."—Exp. Sta. Record, v.14, p.1068.

"Suggestions on varieties of fruit suitable for the home orchard."—Exp. Sta. Record, v.42, p.637.

Not examined.


"A paper on this subject prepared for the Iowa State College and State Horticultural Society, and comprising a descriptive list of the more important varieties of apples grown in Iowa. A list of cited literature is included."—Exp. Sta. Record, v.37, p.647.

Lists are given of varieties of fruits recommended for planting on the Newlands project. Apples are included.

"A popular article directing attention to several new and meritorious varieties of fruits, a large proportion of which were originated at the New York State Experiment Station."—Exp. Sta. Record, v.45, p.135.

Consists of descriptive accounts of 12 new varieties for distribution in 1914 and a statement as to the terms of distribution.

"The eighth in a series of bulletins ... relating to fruits found worthy at the station, this features the Medina apple, Phelps pear, American Mirabelle plum, and Sheridan grape, all illustrated in color. Other fruits described are the Lodi, Orleans, Milton, Sweet Delicious, and Sweet McIntosh apples, the Pulteney pear, Brant Raspberry, Pontiac grape, President and Santa Rose plums, and Giant cherry. With the exception of the three last-named varieties, all are station originations."—Exp. Sta. Record, v.54, p.643.

700. Hedrick, U. P. New or noteworthy fruits. (In International Garden Club Jour., v.3, no.3, Sept. 1919, p.370-369) 81 In82J
"A contribution from the New York State Experiment Station, in which the author calls attention to the hardy fruit testing work of
the station and describes some of the new or noteworthy varieties of orchard and small fruits tested."-Exp. Sta. Record, v.42, p.39.

   The popular edition of this bulletin is entitled "Some good fruits recently grown."

   King David apple: p.306.

   The "Perfect" apple is described on pages 5-6.

   Apples: p.3-6.

   Apples: p.3-6.

   "Apples in Oregon": p.77-87. On p.85 there is a short descriptive list of promising new apples from the Northwest taken from the Report of the U. S. Pomologist for 1894.

   Apples: p.1-5.
   "The varieties described in this circular have been previously described in Bulletins nos.497 and 514 which are numbers VI and VII, respectively, of the series of publications on 'New or Noteworthy Fruits'. These two bulletins are no longer available for distribution."-Footnote, p.1.

   "Varieties of apples": p.210-278.

   "An alphabetical catalogue is given of the apples that have grown or have originated in New York, in which the characteristics and season of each variety are noted, its suitability for different sections of the State pointed out, and general remarks given on its use-
fulness. In addition a discussion is given of the distribution of varieties of apples and the adaptation of groups of apples. Under the leading heading a large number of varieties of apples have been classified into groups, such as Aport Group, Baldwin Group, Early Harvest Group, Famous Group, etc. New York state is divided into 9 pomological districts, and lists of varieties which may be successfully cultivated for different purposes given for each. A list of varieties of apples which are unworthy a place among the apples of New York is included in the Bulletin, as well as a list of those which have not been sufficiently tested to justify comment on them."-Exp. Sta. Record, v.17, p.1157.


713. Hudson, James. Fruit culture in pots. (In Garden, v.58, no.1507, Oct. 6, 1900, p.264, 265) 80 016 "Fruit houses, potting and pruning trees, and varieties of peaches, plums, cherries, pears, and apples best suited for growing in pots are noted."-Exp. Sta. Record, v.12, p.353.


716. Illinois state horticultural society. [Lists of fruits for Illinois] (In its Trans., new series, v.49, 1914, p.21-23) 81 116 "Variety lists are given of orchard [includes apples] and small fruits recommended for planting in northern, central and southern
Illinois."-Exp. Sta. Record, v.34, p.42.

717. Indiana horticultural society. Twenty-five Indiana apple varieties. (In its Trans. 1917, p.363-367) 81 In2
Descriptive notes on the varieties are given.

718. Iowa state horticultural society. Fruit list. (In its Rept. v.41, 1906, p.220-225) 81 In9
"A list is given of apples, crabapples, plums, cherries, grapes, and small fruits suggested as standard varieties for Iowa, together with a list of supplementary varieties. Varieties are indicated which appear to be specially adapted to the northern drift soil, and to the southern loess soil. Charts are included showing the nature of the soil, elevation, rainfall, and temperature throughout the State, for the purpose of assisting those interested in the study of varieties."-Exp. Sta. Record, v.18, p.940.

"The history is given of an apple which has been grown in the Hudson River Valley for a number of years, but which has not previously been publicly described. It is called the Barringer, after Mrs. J. H. Barringer, daughter of the originator of the fruit."-Exp. Sta. Record, v.16, p.876.

"This paper is devoted largely to descriptions of apple, pear, plum, and cherry varieties which have proved their adaptability to Iowa, particular stress being laid on those sorts introduced by the Station."-Exp. Sta. Record, v.52, p.442.

"Descriptions of 8 varieties which originated in Ohio, with a list of summer, autumn, and winter varieties for the State."-Exp. Sta. Record, v.13, p.50.

"Literature list": p.262-263.

"Of many new varieties of apples tested at the station, none possessed sufficient outstanding qualities to deserve general trial. The Westchester and Schoharie varieties received from the N. Y. State Station possessed some merit for home uses, but the Cortland was deemed unpromising for Michigan."-Exp. Sta. Record, v.54, p.538.
Notes on varieties of apples: p.201-203.

This report on fruits at the Station contains a section on apples (p.320-325). There is a list of varieties, when planted, etc. 
Brief descriptive accounts are given for some varieties.

Varieties are listed in order of adaptability.

727. McElroy, M. S. The home apple orchard. (In Farming, v.3, no.4, May, 1907, p.140,141) 6 F2292 
"Directions are given for the planting and subsequent care of a home apple orchard, together with a list of varieties recommended for planting in different sections of the United States."-Exp. Sta. Record, v.19, p.38.

Varieties are described. 
Discussion: p.78-80.

A few varieties of apples are described on p.4-5.

Fruit catalogue for 1890: p.230-249.


"The adaptability of the Russian apples to Iowa is discussed and descriptive notes are given on 56 varieties fruited by the author."-Exp. Sta. Record, v.9, p.650.

Contains a list of varieties of apples, pears, peaches, plums, cherries, grapes, blackberries, apricots, currents and raspberries recommended for a commercial orchard.

"Lists of varieties of apples, pears, plums, cherries, blackberries, raspberries, currants, gooseberries, strawberries, and grapes recommended for culture in different portions of the State."-Exp. Sta. Record, v.5, p.935.

Apple varieties; p.69-83.

"The apple orchard at Orono" with notes on varieties; p.147-153.

738. Nebraska state horticultural society. Recommended list of hardy fruits, flowers, and plants, including shrubbery, shade and ornamental trees, evergreens, etc. Report of Committee. (In its Rept. 48th, 1917, p.159-177) 81 N37

739. New Jersey state horticultural society. Fruit list for 1908. (In its Proc. 33d, 1908, p.183-188) 81 N42
Consists of lists of fruits that are giving the growers the most satisfaction in the three sections of the state.

"A large number of varieties of apples have been grown at the station for 12 years, the last 7 of which the trees have been in bearing. Many of these are varieties suited to supply fruit continuously from June to the first of April. Detailed descriptions and drawings are given of 30 of these varieties and recommendations as to the best summer, autumn, and winter varieties to plant in mountain regions, hill regions, and the pine belt."-Exp. Sta. Record, v.17, p.865.

Observations are made on varieties growing at the station and certain ones are recommended for planting.

"In this article the author briefly describes his experience in growing apples and gives notes on the character and condition of a
large number of varieties tested in his orchard. In most cases twenty or more trees of each variety were planted."-Exp. Sta. Record, v.31, p.45.

Consists of 2 tables planned "to assist the person who would grow apples and have a favorable ledger balance as a result."

Consists of descriptions of certain varieties, with special reference to the Ozark region.


On p.12-16 there is a descriptive list of certain varieties which apply specifically to Lawrence County, Indiana. The list was compiled by a Mr. Burton.

747. Oskamp, Joseph. Varieties of fruit for Indiana planting. LaFayette, Ind. 1914. 4p. (Purdue Univ. Dept. agr. ext. Leaflet 46)

748. Price, H. L. Varieties of fruit for the home orchard. Blacksburg, 1906. p.122-144. (Va. Agr. Exp. Sta. Bul. 161 (v.14, no.6), "Brief descriptions are given of a few of the better varieties of each of the different orchard and small fruits which may be grown in the home garden. Directions are also given for laying out and planting orchards."-Exp. Sta. Record, v.18, p.337.

Contains a descriptive list of new varieties "that have been widely tried and [which] show promise of being desirable and profitable for the South."

"Index to the American literature of the apple, 1804 to 1904": p.375-383.

"The lists in the present bulletin are compiled from those in Bulletin no. 8 [Division of Pomology] with such modifications as longer experience has rendered necessary."-p. 3.


Crabapples: p. 34-35.


755. Russell, L. W. Pomology in Rhode Island. (In R. I. State board of agr. Rept. 14th, 1898, p. 29-49) "List of orchard and small fruits most successfully cultivated by growers throughout Rhode Island, with comments by the different growers; and suggestions for locating and managing orchards with reference to Rhode Island conditions."-Exp. Sta. Record, v. 11, p. 937.

756. Russian apple nomenclature commission. Report of the first meeting of the Russian apple nomenclature commission, appointed by the state horticultural societies of Iowa, Minnesota, Wisconsin, and South Dakota. Meeting held at La Crosse, Wisconsin, August 30th and 31st, 1898. Minneapolis, Harrison & Smith, printers, 1898. 10p. 93 R923


759. Secor, Eugene. [Apples in Iowa] (In Iowa state horticultural soc. Rept., v. 35, 1900, p. 55-72) 81109 "From 150 answers to a circular letter of inquiry the secretary of the society has compiled a list of apples that may be grown with assurance all over the state of Iowa... The areas where these and some other varieties thrive best are mapped out for the State."-Exp. Sta. Record, v. 8, p. 352.
   "A summarized study of the apples of the Ben Davis group relative to their history, distinguishing characteristics, and quality. A study of the available literature together with information gleaned from authorities in systematic pomology gave a list of 40 varieties as possible candidates for this group. Twenty of these varieties, however, are believed to belong elsewhere or be synonyms. The remainder are here separately considered and described."-Exp. Sta. Record, v.24, p.240.

   "This bulletin discusses methods and terms used in the systematic and commercial description of apples, both trees and fruit. It is intended for the use of students and investigators in pomology."


   (In Western Wash. Agr. Exp. Sta. Monthly bul. v.8, no.9, Dec. 1920, p.130,131)
   "A revised varietal list of orchard and small fruits recommended for Western Washington."-Exp. Sta. Record, v.44, p.536.

   Contains a list of the more worthy or promising varieties of apples, pears, plums, cherries, etc., suitable for the home garden.

   "Horticultural descriptions are given of a number of varieties of apples, pears, plums, and cherries which are adapted for both the home and the commercial orchard in Western Washington."-Exp. Sta. Record, v.33, p.44.

   Consists of a list of varieties of apples, pears, peaches, plums, cherries, figs, etc., suitable for the mountain, middle, southern, and coast regions of the State.

   List of varieties: p.49-52.

"For several years the author has been investigating the seedling apples of Arkansas origin. In this preliminary report of the investigation, descriptive and historical notes are given on twenty of the most important of these seedling apples."-Exp. Sta. Record, v.10, p.48.

   "The writer gives the results of further study of Arkansas seedlings, a continuation of work previously reported... Twenty-five varieties are described and characteristics noted. An effort is made to straighten the nomenclature of the apples noted and their value as new economic varieties is discussed."-Exp. Sta. Record, v.12, p.151.


   "The author sent letters of inquiry to all the prominent fruit men of the state regarding the best varieties to grow in their respective localities. The replies of 30 of these growers have been tabulated with reference to peaches and apples, and 15 of the more promising varieties of apples are briefly described. The apple oftenest mentioned as most successful in Missouri and placed first as a commercial fruit is Ben Davis, with Geno second."-Exp. Sta. Record, v.14, p.440.

   Includes a discussion of varieties to plant and a descriptive list of varieties.


   "Popular hints are given on selection of trees, care of trees when received from the nursery, planting and pruning. Lists of varieties of apples, pears, plums, peaches, cherries, grapes, currants, gooseberries, raspberries, blackberries, and strawberries adapted to different sections of the state are suggested for home use and marketing. Notes are given on the peculiar merits of a number of recommended varieties."-Exp. Sta. Record, v.11, p.153.

"Among the fruits mentioned and described are Ingram apple, Mc-Intosh apple, Carmen peach, Red June plum, Dickson apple, Downing grape, Mulgoa mango, and Advance loquat. Colored plates are given of these different fruits."-Exp. Sta. Record, v.14, p.356.

   Apples: p.470-473.


   "It is the purpose of this article, in continuation of those on the same subject in the Yearbook since 1901, to suggest to fruit growers in various sections of the country certain little known or recently introduced fruits that are worthy of attention either for the home fruit garden or the commercial plantation."-p.474.

   Apples: p.376-378.

781. Thomas, H. H. The book of the apple ... together with chapters on the history and cookery of the apple, and on the preparation of cider, by the editor. London and New York, John Lane, 1922. 112p.
   93 T362
   Varieties: p.63-76.

   81 Or52
   "A paper with a discussion following in which the author presents his observations covering several years relative to the adaptation of a large number of commercial varieties of deciduous fruits in different sections of the Pacific northwest. With these observations as a basis, a list is given of apples, pears, cherries and peaches adapted for the coast region, inland valleys and inland uplands."-Exp. Sta. Record, v.29, p.745.

"Notes on 43 varieties of Russian apples which fruited at the station during the season. Not one variety in the whole list can be classed as a winter apple in Indiana."-Exp. Sta. Record, v.12, p.54.

785. U. S. Dept. of agriculture. Apples for the southern states. (In its Rept. 1869, p.184-198)
Consists of a list of "a few of the most popular summer and fall fruits, and a selection of the best winter varieties."


789. Utah. State board of horticulture. Best fruits for Utah planting. Salt Lake City, 1904. (In its Bul. 9, p.18-22) 81 Ut1B
Apples: p.18-19.

(Mass. agr. col. Ext. leaflet 42)
Not examined.

"In this bulletin the authors divide the State into eight districts and give lists of varieties of orchard and small fruits recommended for culture in each district. The principal varieties of apples are also considered with reference to their strong and weak points."-Exp. Sta. Record, v.33, p.44.

792. Warder, J. A. American pomology. Apples. N. Y., Orange Judd and company, [1867]. 744p. 93 W21
"Descriptions of apples, arranged according to their classification alphabetically, under each division": p.331-697.
"Fruit lists": p.698-710.
"Catalogue and index of apples": p.711-737.

"Brief directions for the culture of orchard fruits in this region
and tabulated notes on varieties of apples, pears, plums, and grapes growing at the substation."-Exp. Sta. Record, v.4, p.653.

Consists of descriptive notes on various varieties.

"The best varieties of fruits for Tennessee": p.6-10.

Descriptions of varieties of apples: p.78-80.

"Descriptions and notes of varieties": p.89-92.

"The author enumerates and briefly describes the varieties of orchard and small fruits most desirable for the home garden in Massachusetts."-Exp. Sta. Record, v.15, p.28.
Apples: p.30-33.

"Hardy varieties of apples": p.28-32.

"Popular and unpopular varieties": p.281.
"Notes and descriptions": p.285-313.

Discussion: p.361-363.


Consists mainly of a list of varieties of apples, apricots, cherries,
etc., most popular in California, Oregon, Washington, Utah and Idaho.


"The author presents data showing the main features of the growing seasons of different sections of British Columbia, including temperature and rainfall observations and notes on the adaptability of the more important varieties of apples to climatic conditions in the different sections."-Exp. Sta. Record, v.35, p.237.


Practically every volume of the reports of this society contains a list of recommended fruits.


"In this bulletin the opinions of several well-known horticulturists are given with respect to the relative value of the Spencer seedless apple."-Exp. Sta. Record, v.19, p.339.


Notes on varieties: p.4.

808. Wyoming state board of horticulture. Fruits adapted to Wyoming. (In its Special bul. v.1, no.2, Jan. 1910, p.6-10) 81 W992

"A list based on data secured in different sections of the state is given of some of the best varieties of apples, pears, plums, cherries, raspberries, currants, gooseberries, and strawberries, adapted for culture in Wyoming."-Exp. Sta. Record, v.22, p.640.
INDEX

Abbot, M. J. ........................................ 1
Abell, T. H. ........................................ 2
Accounting records ................................. 105
Adams, R. L. ......................................... 3
Adams, Samuel ...................................... 4
Adams County, Pa., Fruit growers' association ....... 282,680
Alabama, Agricultural experiment station ............. 650,741
Alabama, Dept. of agriculture ........................ 38
Alabama state horticultural society ................... 38
Alderman, W. H. .................................... 5-7
Alexander, H. L. .................................... 8
Alfalfa ............................................. 3,253
Allen, R. W. ......................................... 270
Almonds ............................................. 3,271
Alwood, W. E. ...................................... 9-12,441,619-623
American apple growers congress ............. 14,156,195-196, 409, 452, 481, 602
American fruit and produce association .............. 15
American phytopathological society .................. 51-52
American pomological society ...................... 10, 594,659,788
American railway perishable freight association ...... 108
American society for horticultural science ........... 47,103,643,722
See also Society for horticultural science
American society of refrigerating engineers ........... 228
American warehousemen's association ................ 471
Ames, C. T. ......................................... 749
Andrews, Frank .................................... 202,624
Anthony, R. D. .................................... 16
Apple campaign, New York .......................... 356
Apple candy ........................................ 2
Apple sauce, See Apples, canned
Apple skins, cutinization ......................... 393
Apples acreage
   England and Wales ............................... 512
   irrigated land ................................ 494

APPLES - Continued
acresage - continued
United States ................................. 14,25
California ..................................... 79,225
Colorado
   Fremont County .......................... 435
   Mesa County ................................ 434
Illinois .......................................... 237
Iowa, Mills County ............................ 206
Missouri, Ozark region ......................... 148
New Jersey ....................................... 349
   Atlantic County ........................... 186
New York
   4 western counties ......................... 72
   Orleans County .............................. 575
   Wayne County ................................ 578
Ohio counties .................................. 592
Oregon, Jackson County ......................... 271
Utah ............................................. 563
Virginia, Frederick County ......................... 472
West Virginia, Berkeley County ....................... 19
acresage (bearing)
United States ..................................... 423
   California .................................... 79,81
   Colorado, Mesa County ..................... 434
acresage (non-bearing)
California ......................................... 79
advertising ....................................... 194,123,443-444
   cooperative, Maine ......................... 293
   Virginia ....................................... 75
arrivals
   Baltimore ....................................... 509
   Boston ......................................... 245,509
   Chicago ........................................ 509
   New York City ................................ 509
   St. Louis ...................................... 509
   states ......................................... 531
available for sale
   Palmer Township, Ohio ...................... 215
barreled ......................................... 174,219,355,442,493,
   508,511,522,524-525,527-528,552,564
bibliographies 136-137,317,321,578
blooming dates ................................... 415
Iowa ............................................. 415
boat rates, See freight rates
Apples - Continued

booms ........................................ 176
boxed ... 175, 259, 334, 383, 403, 416, 493, 508, 511, 522, 552, 564
brands ...................................... 233
by-products .... 2, 13, 46, 174, 601
California .................................. 79
Montana, Bitter Root Valley ........... 173
Rhode Island .............................. 461
See also utilization of waste
by-products plants
Pennsylvania ......................... 16
certification and certificates ........... 552, 553
Oregon ................................ 371, 372
Washington ............................. 587
cold storage ... 39-40, 59, 87, 90-92, 95, 97, 99, 111, 147, 162, 184, 209, 211, 255, 311, 335, 397, 398, 409-414, 441, 421, 426, 480, 483, 510
bibliography ......................... 593
Indiana firms ............................. 610
Iowa ............................... 165, 208, 598
New York ................................ 35
Pennsylvania
    Marble laboratory 30C-301
    Vermont ............................ 134
See also cool storage;
storage

cold storage holdings
Canada .................................... 239
United States ... 26-37, 174, 265, 335, 504, 507-509, 511, 517-518, 521, 535, 549
Massachusetts, Boston . 321
Northwestern States ........ 324
States ...................... 239, 351
Virginia ............................ 477
Washington ......................... 340
Western States ...................... 175
cold storage houses
Pennsylvania ......................... 16
cold storage rates .................... 560
Northwest ............................ 361
color ............. 112, 286, 464, 552-553
consumption, Boston .......... 15
Detroit stores, etc .... 189
Indiana, Wayne County .... 377
Rhode Island .......... 119

Apples - Continued

cost of harvesting
Indiana .................................... 611
Iowa, Mills County ............. 206
New York (lo orchard) ...... 121
Virginia ............................ 75
Washington
    Wenatchee Valley ........... 329
cost of hauling
Idaho, Payette Valley .... 487
West Virginia
    Berkeley County ........... 19
cost of marketing ........ 171, 335
    Iowa, Mills County ........ 206
    Massachusetts ........... 244
    New Hampshire ........... 424
    New York (western) ...... 117
    New York area .......... 403
    Ohio ......................... 445
    Washington ................. 529
cost of marketing, direct .... 171
    New York ........................ 579
cost of packing ................. 61
    Indiana ......................... 611
    New York (western) ....... 117
    Washington
        Cashmere fruit growers union .... 224
### Apples - Continued

<table>
<thead>
<tr>
<th>Item</th>
<th>cost of packing - continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia</td>
<td>Berkeley County</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>244</td>
</tr>
<tr>
<td>West Virginia</td>
<td>Berkeley County</td>
</tr>
</tbody>
</table>

### Item

<table>
<thead>
<tr>
<th>Item</th>
<th>cost of production</th>
<th>68,179-180, 184,214,216,225,422,601</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>517</td>
<td></td>
</tr>
<tr>
<td>Mesa County</td>
<td>457</td>
<td></td>
</tr>
<tr>
<td>Western</td>
<td>486</td>
<td></td>
</tr>
<tr>
<td>Idaho</td>
<td>517</td>
<td></td>
</tr>
<tr>
<td>Payette Valley</td>
<td>487</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>489</td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Maine</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>Winthrop</td>
<td>153</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>120,573</td>
<td></td>
</tr>
<tr>
<td>Minnesota</td>
<td>47-50</td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>168</td>
<td></td>
</tr>
<tr>
<td>compared with Northwest</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>424</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>93,121,327,517</td>
<td></td>
</tr>
<tr>
<td>Auchter orchard</td>
<td>218-219</td>
<td></td>
</tr>
<tr>
<td>Monroe County</td>
<td>457</td>
<td></td>
</tr>
<tr>
<td>Orleans County</td>
<td>328,457</td>
<td></td>
</tr>
<tr>
<td>Western New York</td>
<td>570</td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>162,445</td>
<td></td>
</tr>
<tr>
<td>Benedict orchard</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Smitskon, Stokes and Starcher orchards</td>
<td>193</td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>517</td>
<td></td>
</tr>
<tr>
<td>Hood River Valley</td>
<td>62,486</td>
<td></td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
<td></td>
</tr>
<tr>
<td>Wasco County</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>272</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>relation to yield</td>
<td>173</td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>75,517</td>
<td></td>
</tr>
<tr>
<td>Frederick County</td>
<td>472</td>
<td></td>
</tr>
<tr>
<td>Winchester</td>
<td>384</td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>517</td>
<td></td>
</tr>
<tr>
<td>Wenatchee Valley</td>
<td>229,443, 591</td>
<td></td>
</tr>
<tr>
<td>Yakima Valley</td>
<td>330</td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td>Berkeley County</td>
<td>19, 136</td>
</tr>
</tbody>
</table>

### Apples - Continued

<table>
<thead>
<tr>
<th>Item</th>
<th>cost of storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York (western)</td>
<td>117</td>
</tr>
<tr>
<td>cost of storage house</td>
<td>254</td>
</tr>
<tr>
<td>cost of transportation</td>
<td>64,529</td>
</tr>
<tr>
<td>crop conditions</td>
<td>509,512,519, 536,555,567</td>
</tr>
<tr>
<td>crop failure, cause</td>
<td></td>
</tr>
<tr>
<td>New York (western)</td>
<td>22</td>
</tr>
<tr>
<td>United States</td>
<td>512,513,518</td>
</tr>
<tr>
<td>crop forecasts</td>
<td>512,518,530, 535,548</td>
</tr>
<tr>
<td>culls and crops</td>
<td>191,219</td>
</tr>
<tr>
<td>culture</td>
<td>23,27,42,95,114,155</td>
</tr>
<tr>
<td>Colorado</td>
<td>255-256,255,411-412,422</td>
</tr>
<tr>
<td>Delaware</td>
<td>428,444-445,464,466,497,601</td>
</tr>
<tr>
<td>Eastern States</td>
<td>636,667,727</td>
</tr>
<tr>
<td>Georgia</td>
<td>430</td>
</tr>
<tr>
<td>Idaho</td>
<td>430</td>
</tr>
<tr>
<td>Payette Valley</td>
<td>487</td>
</tr>
<tr>
<td>Indiana</td>
<td>488,610</td>
</tr>
<tr>
<td>Iowa</td>
<td>208,664</td>
</tr>
<tr>
<td>Maine</td>
<td>344</td>
</tr>
<tr>
<td>Kennebec County</td>
<td>344</td>
</tr>
<tr>
<td>Maryland</td>
<td></td>
</tr>
<tr>
<td>Green Ridge Valley</td>
<td>149</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>317,798</td>
</tr>
<tr>
<td>Missouri</td>
<td>168</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>430</td>
</tr>
<tr>
<td>New Jersey</td>
<td>166,566,634</td>
</tr>
<tr>
<td>North Carolina</td>
<td>358,360</td>
</tr>
<tr>
<td>Northwest</td>
<td>462</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>98</td>
</tr>
<tr>
<td>Oregon</td>
<td>261-262,273</td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Ozark region</td>
<td>571</td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>615</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>16,74,463</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>Southern States</td>
<td>667</td>
</tr>
<tr>
<td>under irrigation</td>
<td>187</td>
</tr>
<tr>
<td>Utah</td>
<td>553</td>
</tr>
</tbody>
</table>
Apples - Continued

culture - continued

Vermont............ 132,470
Addison County.... 588
Grand Isle County. 588
Virginia ............ 283
Washington .......... 177
West Virginia ...... 110
Jefferson County... 246
Wisconsin .......... 194
deals
Colorado .......... 531
Massachusetts
Boston .......... 318-319
Michigan .......... 531
New York, western.. 531
Northwestern states 531
Pacific Northwest.. 531
Pennsylvania ....... 531
Potomac-Shenandoah-
Cumberland district 531
Virginia ............ 531
West Virginia ...... 531
dehydration
California .......... 86
direct marketing. See marketing, direct
diseases. See insects
and diseases
distribution ... 64,190,335,395
California .......... 81
New Jersey .......... 146
New York .......... 579
Wayne County ....... 578
Northwestern apples 259
Rhode Island ....... 119
distribution of American and
Canadian apples in the
United Kingdom ....... 597
distribution of receipts
Utah Lake Valley ... 106,484
Virginia
Frederick County.... 472
districts. See regions
dwarf, Rhode Island ... 461
evaporation .......... 76,200
bibliography ........ 76
See also Apples, dried
export charges ........ 245
exporting .......... 231

Apples - Continued

exports ...
Canada ... 179-190,245, 336, 351,535
foreign countries ... 174, 245, 521
Nova Scotia ....... 179
United States ... 84,127,148, 158,174,180,245,255,285,
331,432,479,481,492,494,
497,511-512,517-522,535,
555,556,559,578
California .......... 84
Massachusetts ....... 618
Northwestern states 259
states ............ 531
Virginia ............ 477
Western States ...... 175
See also foreign trade
exports, value, United
States ... 84,127,148, 158,174,180,245,255,285,
331,432,479,481,492,494,
497,511-512,517-522,535,
555,556,559,578
foreign trade ... 174-175, 280,
323,362,555,559
See also exports
freezing and freezing in-
jury ....... 90,147,207,209
bibliography .......... 147
Iowa .............. 208
freight rates ... 64,161,340,511,
518
Indiana ............ 610
Maryland
Green Ridge Valley 149
New Hampshire, Keene. 424
Northwestern states 259,361
ocean freight rates 293,511,
597
states ............. 531
Washington, Wenatchee 424
West Virginia
Charleston ....... 17
grades and grading ... 27,94,96,
100,161,170,174,180,183,
185,222,229,233,240,241,
247,267-268,276,284-285,
294,298,303,315,335,347,
351-352,355,378,395,396,
401,402,444,458,474,492,
500-501,550,552,596,601,
608
Apples - Continued

grades and grading - continued

Arkansas ...................... 224
Canada ........................ 240
California .................... 79, 23
Coastal Plains region .... 201
Colorado ...................... 104
Delaware ...................... 142
Idaho ......................... 234-236
Maine ......................... 153, 293, 324a
Maryland ...................... 445, 473
Massachusetts ................ 347, 314-315; 317, 506
New England .................. 450
New Hampshire ............... 346-347, 601
New York ...................... 355, 354-355, 527-528
North Carolina ................ 359
Northwestern States .......... 324, 351, 162, 502
Ohio .......................... 139, 356
Oregon ......................... 336-372
Hood River County ........... 236
Pacific Northwest ............ 296, 360
Pennsylvania .................. 16, 390, 392
Rhode Island .................. 119
South Carolina ................ 212
Vermont ....................... 470
Virginia ....................... 566
Washington .................... 591
Wisconsin ...................... 26, 247, 406, 605-606

grading machines. See sizers
and sizing machines

growers and owners of
orchards

Illinois ....................... 237
Pennsylvania .................. 337
Vermont, Grand Isle County 583
Virginia ....................... 565

handling. 42, 97, 114, 179, 184,
209, 228-229, 254, 266-267
299, 305, 306, 411, 444, 452, 502,
561, 612, 615
Pacific Northwest .......... 351, 420

handling, bulk ................ 145

harvesting. 27, 57, 58, 157, 174,
180, 229, 252, 265, 285, 310,
345, 376, 411, 422, 442, 449,
435, 474, 582, 626

bibliography .................. 213

Apples - Continued

harvesting - continued.

Coastal Plains region ..... 201
Georgia ...................... 224
Indiana ...................... 510
Maryland ..................... 473
Massachusetts ............... 247
Oklahoma ..................... 98
Oregon ....................... . .
Willamette Valley ........... 213
Pacific Northwest .......... 100
Rhode Island .................. 461
Virginia ....................... 75
Washington .................... 345

harvesting dates ............. 512
Utah .......................... 563

hauling ....................... 442

history of apple growing. 351

Alabama ....................... 38
Colorado, Fremont County .. 435
Indiana ....................... 310
New York ...................... 351, 531
Oregon ....................... 261
Pennsylvania .................. 16
Virginia ....................... 63, 394, 477

bibliography .................. 477

Western Virginia

Jefferson County ............ 246

imports ....................... 425, 520-521

foreign countries ............ 245, 373, 521
United States ................ 285, 493-494, 559, 562

Indiana, Wayne County 357

imports, value

United States ............... 493-494

index numbers

United States ................ 494, 518
Massachusetts, Boston 320

Missouri ....................... 123
New York ....................... 576

industry

Australia ..................... 179
Canada ......................... 179, 422
New Zealand ................... 179

United States .......... 64, 113-114,
161, 178, 179, 205, 255, 411, 423,
453, 464, 477, 539, 601

California .................... 416
Connecticut ................... 138
Eastern states ........ 27, 589

Maine ......................... 324a
<table>
<thead>
<tr>
<th>Item</th>
<th>Apples - Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>industry - continued</td>
<td></td>
</tr>
<tr>
<td>Massachusetts ......</td>
<td>245,313, 613</td>
</tr>
<tr>
<td>Missouri .............</td>
<td>168</td>
</tr>
<tr>
<td>New England ..........</td>
<td>242,245, 279,450</td>
</tr>
<tr>
<td>Montana</td>
<td></td>
</tr>
<tr>
<td>Bitter Root Valley</td>
<td>173</td>
</tr>
<tr>
<td>New Hampshire .......</td>
<td>407</td>
</tr>
<tr>
<td>New Jersey ...........</td>
<td>348</td>
</tr>
<tr>
<td>New York .............</td>
<td>351,579</td>
</tr>
<tr>
<td>bibliographical</td>
<td></td>
</tr>
<tr>
<td>footnotes ..........</td>
<td>579</td>
</tr>
<tr>
<td>Niagara County ......</td>
<td>129</td>
</tr>
<tr>
<td>Orleans County ......</td>
<td>574, 575</td>
</tr>
<tr>
<td>Wayne County .......</td>
<td>574,578</td>
</tr>
<tr>
<td>Northwestern states</td>
<td>462,590</td>
</tr>
<tr>
<td>Ohio ................</td>
<td>29,141</td>
</tr>
<tr>
<td>Oregon</td>
<td></td>
</tr>
<tr>
<td>Hood River Valley</td>
<td>62</td>
</tr>
<tr>
<td>Jackson County ......</td>
<td>271</td>
</tr>
<tr>
<td>Ozark region .......</td>
<td>203,371</td>
</tr>
<tr>
<td>Pennsylvania .......</td>
<td>16</td>
</tr>
<tr>
<td>Rhode Island .......</td>
<td>461</td>
</tr>
<tr>
<td>Shenandoah Valley</td>
<td>107</td>
</tr>
<tr>
<td>Vermont .............</td>
<td>132-132,470</td>
</tr>
<tr>
<td>Virginia ............</td>
<td>11,360,394,477</td>
</tr>
<tr>
<td>Washington ..........</td>
<td>340</td>
</tr>
<tr>
<td>injuries and blemishes</td>
<td>172, 185,552-553</td>
</tr>
<tr>
<td>See also winter injury</td>
<td></td>
</tr>
<tr>
<td>insects and diseases</td>
<td>42,51</td>
</tr>
<tr>
<td>91,108,129,132,135,163-164,</td>
<td></td>
</tr>
<tr>
<td>172,184-185,246,258,271,313,</td>
<td></td>
</tr>
<tr>
<td>360,376,397,399,431,410,412,</td>
<td></td>
</tr>
<tr>
<td>444,461,552-553,598,604,643,</td>
<td></td>
</tr>
<tr>
<td>667</td>
<td></td>
</tr>
<tr>
<td>bibliography .......</td>
<td>108,468,604</td>
</tr>
<tr>
<td>inspection .........</td>
<td>174,249,431,524,</td>
</tr>
<tr>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Virginia ............</td>
<td>566</td>
</tr>
<tr>
<td>jelly ...............</td>
<td>13</td>
</tr>
<tr>
<td>judging and scoring</td>
<td>1,167</td>
</tr>
<tr>
<td>266,601,753</td>
<td></td>
</tr>
<tr>
<td>keeping qualities ...</td>
<td>35,95,134,</td>
</tr>
<tr>
<td>374,593,409,414,490,510,617</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Apples - Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>loading .............</td>
<td>34,108,182,386,418,442,</td>
</tr>
<tr>
<td>474</td>
<td></td>
</tr>
<tr>
<td>margins and costs</td>
<td></td>
</tr>
<tr>
<td>New York (western)</td>
<td>117</td>
</tr>
<tr>
<td>New York area .......</td>
<td>402-405</td>
</tr>
<tr>
<td>Washington ..........</td>
<td>529</td>
</tr>
<tr>
<td>New Jersey, Trenton</td>
<td>586</td>
</tr>
<tr>
<td>market preferences</td>
<td>174,335, 601</td>
</tr>
<tr>
<td>Massachusetts .......</td>
<td>245,316</td>
</tr>
<tr>
<td>New York ............</td>
<td>579</td>
</tr>
<tr>
<td>Pennsylvania(10 cities)</td>
<td>338</td>
</tr>
<tr>
<td>Rhode Island .......</td>
<td>119</td>
</tr>
<tr>
<td>Providence ..........</td>
<td>116</td>
</tr>
<tr>
<td>market condition</td>
<td></td>
</tr>
<tr>
<td>United States .......</td>
<td>522,526, 525-527</td>
</tr>
<tr>
<td>market reports .......</td>
<td>522</td>
</tr>
<tr>
<td>marketing ..........</td>
<td>15,18,23,33,42,</td>
</tr>
<tr>
<td>61,68,114,135,146,156,158,</td>
<td></td>
</tr>
<tr>
<td>159,174-175,179-180,233,</td>
<td></td>
</tr>
<tr>
<td>249,252,256,267,280-283,</td>
<td></td>
</tr>
<tr>
<td>285,293,310,312,326,335,</td>
<td></td>
</tr>
<tr>
<td>337,433,444,452,491,504,</td>
<td></td>
</tr>
<tr>
<td>512,584,601-602,614,616,</td>
<td></td>
</tr>
<tr>
<td>636</td>
<td></td>
</tr>
<tr>
<td>bibliography .......</td>
<td>174-175, 411,468,582-585</td>
</tr>
<tr>
<td>boxed apple regions</td>
<td>175</td>
</tr>
<tr>
<td>Coastal Plains region</td>
<td>201</td>
</tr>
<tr>
<td>Colorado ............</td>
<td>531</td>
</tr>
<tr>
<td>Georgia .............</td>
<td>284</td>
</tr>
<tr>
<td>Indiana .............</td>
<td>488</td>
</tr>
<tr>
<td>Wayne County .......</td>
<td>377</td>
</tr>
<tr>
<td>Maine ...............</td>
<td>293-295,324a</td>
</tr>
<tr>
<td>Maryland ............</td>
<td>531</td>
</tr>
<tr>
<td>Massachusetts ......</td>
<td>245,314</td>
</tr>
<tr>
<td>316,318,319,321,618</td>
<td></td>
</tr>
<tr>
<td>Michigan ............</td>
<td>199,325,531</td>
</tr>
<tr>
<td>Montana .............</td>
<td></td>
</tr>
<tr>
<td>Bitter Root ..........</td>
<td>193</td>
</tr>
<tr>
<td>New England ..........</td>
<td>450</td>
</tr>
<tr>
<td>New Hampshire .......</td>
<td>347,407</td>
</tr>
<tr>
<td>New Jersey ..........</td>
<td>349,568</td>
</tr>
<tr>
<td>Atlantic County ....</td>
<td>126</td>
</tr>
<tr>
<td>New York ............</td>
<td>404-405,531</td>
</tr>
<tr>
<td>Orleans County ......</td>
<td>575</td>
</tr>
<tr>
<td>Northwestern states</td>
<td>324,531</td>
</tr>
</tbody>
</table>
Apples—Continued
marketing—continued
Ohio (3 orchards) 198
Oregon, Jackson County 271
Ozark region 571
Pacific region 551
Pennsylvania 16,531
10 cities 388
Rhode Island 461
Vermont 470
Virginia 551
West Virginia 551
Wisconsin, Trempealeau County 159
marketing, direct 32,171
New York 351
marketing, parcel post 483
markets 69,161,174,411
Coastal Plains region 201
foreign 280,330,334-336,373
Great Britain 554
Maryland, Green Ridge Valley 149
Massachusetts 618
New Jersey, Atlantic City 186
New York 404-405
Oregon 150
Southern 417
West Virginia
Jefferson County 246
monuments 23
pack 180,552-553,596,599
Coastal Plains regions 201
Indiana firms 610
Massachusetts 247
Middle west 221
New Jersey 371-372
Rhode Island 119
Washington 581
See also containers

See also preparation for market

packing houses 184, 382
New York 351
Northwest 381,441-442
packing train, New York 351
parcel post marketing. See marketing, parcel post
per cent of commercial crop in storage 285
per cent of crop harvested monthly 518
Alabama 595
per cent of crop in growers' hands 548
per cent shipped by rail, New Jersey 357
per cent shipped out of counties 'where grown' 504
Item

Apples - Continued

phenological records
Coastal Plains region .... 201
South Atlantic states .... 679
picking .... 1, 5, 34, 97, 123-126, 161,
180, 183-184, 228, 252, 255, 269,
283, 328, 353, 444, 452, 474, 584,
601, 618
bibleography .......... 468
California .............. 79
Indiana .................. 488
Iowa ..................... 208
Montana, Bitter Root Valley 173
Pacific Northwest ...... 350
Pennsylvania ............ 463
Vermont, Grand Isle County 583
picking dates .......... 25
pollination .... 75, 184, 262, 273, 461
preparation for market .. 271, 442,
447, 614
New Jersey ............. 349
North Carolina ........ 358, 360
See also harvesting, packing
price spreads. See margins
and costs
prices ........ 161, 174, 180, 184, 254
China, Shanghai ....... 334
Great Britain .... 174, 509, 511,
535, 597
United States .... 21, 64, 161, 440,
494, 497, 504, 509, 512, 519-522,
535-536, 555, 559, 562, 577, 601
cities
Baltimore .... 21, 509, 511
551
Boston .... 21, 320, 423, 509, 511
Chicago ..... 323, 509, 511, 562
Cincinnati .......... 323
Cleveland ............. 551
Indianapolis ........... 323
Kansas City ........... 21
New York City .... 21, 111,
260, 323, 335, 348, 351,
354, 509, 511, 518-521,
551, 579
New York Port
District .............. 539
Philadelphia .... 21, 551
Pittsburgh ........ 509, 551
Richmond City, Ind. ... 377
St. Louis ........ 509, 511
Washington .......... 21, 551

Apples - Continued

prices - continued
United States - continued
states .... 504, 509, 512, 517
518, 531, 555
California ........ 3, 509
Connecticut .......... 513
Maine ........ 324a, 513
Maryland
3 counties .... 144
Massachusetts .... 244-245,
321, 424, 513, 618
Missouri ........ 123
compared with North-
west ........ 190
Mountain States .... 514
New Hampshire .... 407, 513
New Jersey ........ 513
New York, 513, 576, 579, 601
Auchter orchard 218,
219
Niagara County .... 129
Orleans County .... 575
Wayne County ..... 578
Ohio
Palmer Township 215
Oregon
Hood River Valley 62
Jackson County .... 271
Pacific States .... 514
Pennsylvania .... 513
Potomac Valley ship-
ping points .... 551
Rhode Island .... 119, 513
Vermont ............ 513
Virginia
Frederick County 472
Washington .... 340
West Virginia
Berkeley County 19
Jefferson County 246
Western States .... 175
prices, effect of direct
marketing on .... 171
prices, export ..... 559, 578
prices of cold storage
apples .......... 421
prices paid at canning facto-
rries and evaporators 200
New York, Wayne County 578
Utah Lake Valley .... 484
<table>
<thead>
<tr>
<th>Item</th>
<th>Apples - Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>production .......... 464, 571</td>
</tr>
<tr>
<td></td>
<td>Australia ............ 336</td>
</tr>
<tr>
<td></td>
<td>Canada ................ 535</td>
</tr>
<tr>
<td></td>
<td>British Columbia .... 179</td>
</tr>
<tr>
<td></td>
<td>Nova Scotia .......... 179</td>
</tr>
<tr>
<td></td>
<td>foreign countries .... 245</td>
</tr>
<tr>
<td></td>
<td>California ............ 81, 509, 510, 520, 525, 256, 257</td>
</tr>
<tr>
<td></td>
<td>Colorado, Mesa County 434</td>
</tr>
<tr>
<td></td>
<td>Connecticut ........... 138</td>
</tr>
<tr>
<td></td>
<td>Idaho, Payette Valley 487</td>
</tr>
<tr>
<td></td>
<td>Indiana ............... 611</td>
</tr>
<tr>
<td></td>
<td>Iowa .................. 377</td>
</tr>
<tr>
<td></td>
<td>Iowa and counties .... 206</td>
</tr>
<tr>
<td></td>
<td>irrigated land ........ 494</td>
</tr>
<tr>
<td></td>
<td>Kansas and counties .. 256, 257</td>
</tr>
<tr>
<td></td>
<td>Kentucky .............. 137</td>
</tr>
<tr>
<td></td>
<td>Maine ................... 153, 324a</td>
</tr>
<tr>
<td></td>
<td>Massachusetts 245, 321, 618</td>
</tr>
<tr>
<td>Missouri</td>
<td>Ozark region (farms) 148</td>
</tr>
<tr>
<td></td>
<td>compared with Northwest 190</td>
</tr>
<tr>
<td>Montana</td>
<td>Bitter Root Valley 173</td>
</tr>
<tr>
<td></td>
<td>New England ........... 245</td>
</tr>
<tr>
<td></td>
<td>New Hampshire ......... 407</td>
</tr>
<tr>
<td></td>
<td>districts ............ 424</td>
</tr>
<tr>
<td></td>
<td>New Jersey ............ 146, 348, 367</td>
</tr>
<tr>
<td></td>
<td>Atlantic County ...... 186</td>
</tr>
<tr>
<td></td>
<td>New York ............. 245, 354, 564, 579</td>
</tr>
<tr>
<td></td>
<td>counties .... 351, 354</td>
</tr>
<tr>
<td></td>
<td>fruit counties ....... 578</td>
</tr>
<tr>
<td></td>
<td>Niagara County ....... 129</td>
</tr>
<tr>
<td></td>
<td>Orleans County ....... 573</td>
</tr>
<tr>
<td></td>
<td>Wayne County .......... 578</td>
</tr>
<tr>
<td></td>
<td>Western New York ... 179, 423</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Apples - Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>production - continued</td>
</tr>
<tr>
<td>United States - continued</td>
<td>Oregon, Jackson County ... 271</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania .......... 18</td>
</tr>
<tr>
<td></td>
<td>Rhode Island .......... 119</td>
</tr>
<tr>
<td>States and regions .... 174, 178, 202, 206, 246, 255, 464, 494-496, 512, 517-518, 521, 530, 531, 555, 567, 578, 624</td>
<td></td>
</tr>
<tr>
<td></td>
<td>States having irrigation projects 494-495</td>
</tr>
<tr>
<td></td>
<td>Tennessee ............ 137</td>
</tr>
<tr>
<td>Vermont</td>
<td>counties .......... 470</td>
</tr>
<tr>
<td></td>
<td>Addison County ....... 585</td>
</tr>
<tr>
<td></td>
<td>Grande Isle County ... 583</td>
</tr>
<tr>
<td></td>
<td>Virginia .... 9, 12, 472, 477, 555</td>
</tr>
<tr>
<td></td>
<td>Frederick County .... 472</td>
</tr>
<tr>
<td>Washington</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West Virginia ...... 137</td>
</tr>
<tr>
<td></td>
<td>Berkeley County ... 19</td>
</tr>
<tr>
<td></td>
<td>Jefferson County ... 246</td>
</tr>
<tr>
<td></td>
<td>Western States .... 179</td>
</tr>
</tbody>
</table>

| Item | production per capita |
| United States .... 158, 555 |
| New Jersey .......... 248 |
| Western states .... 340 |

| Item | purchases from farmers, amount and value, New Hampshire, 613 |
| purchasing power | United States ........ 577 |
| Missouri ............ 123 |
| Atlantic City ....... 186 |
| Charleston, W. Va ... 17 |
| New Jersey .......... 146 |
| New York City ...... 260, 335, 351, 402, 601 |
| St. Paul ............ 335 |
| United States ....... 522 |

| Item | receipts by types of carriers |
| Massachusetts, Boston 321, 429 |
| New Hampshire, Keene 424 |
| New Jersey .......... 146 |
| Atlantic County ...... 188 |

<p>| Item | receipts, money. See value refrigeration. See cold storage regions | 42, 202, 478, 552-553, 559. |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apples - Continued</strong></td>
<td><strong>Apples - Continued</strong></td>
</tr>
<tr>
<td>regions - continued</td>
<td>shipments - continued</td>
</tr>
<tr>
<td></td>
<td>Colorado</td>
</tr>
<tr>
<td></td>
<td>Grand Valley</td>
</tr>
<tr>
<td></td>
<td>Delaware</td>
</tr>
<tr>
<td></td>
<td>Idaho</td>
</tr>
<tr>
<td></td>
<td>Kentucky</td>
</tr>
<tr>
<td></td>
<td>Maryland</td>
</tr>
<tr>
<td></td>
<td>Michigan</td>
</tr>
<tr>
<td></td>
<td>Montana</td>
</tr>
<tr>
<td></td>
<td>Nevada</td>
</tr>
<tr>
<td></td>
<td>New Hampshire</td>
</tr>
<tr>
<td></td>
<td>New Jersey</td>
</tr>
<tr>
<td></td>
<td>New York</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
</tr>
<tr>
<td></td>
<td>Pacific Coast</td>
</tr>
<tr>
<td></td>
<td>Pacific Northwest</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania</td>
</tr>
<tr>
<td></td>
<td>Tennessee</td>
</tr>
<tr>
<td></td>
<td>Vermont, counties</td>
</tr>
<tr>
<td></td>
<td>Virginia</td>
</tr>
<tr>
<td></td>
<td>Washington</td>
</tr>
<tr>
<td></td>
<td>Wenatchee Valley</td>
</tr>
<tr>
<td></td>
<td>West Virginia</td>
</tr>
<tr>
<td></td>
<td>Charleston</td>
</tr>
<tr>
<td></td>
<td>Western States</td>
</tr>
<tr>
<td></td>
<td>shipments by cooperative organizations, Washington</td>
</tr>
<tr>
<td></td>
<td>shipments to the Orient</td>
</tr>
<tr>
<td></td>
<td>shipping</td>
</tr>
<tr>
<td></td>
<td>New Hampshire</td>
</tr>
<tr>
<td></td>
<td>New Jersey</td>
</tr>
<tr>
<td></td>
<td>See also transportation shipping seasons</td>
</tr>
<tr>
<td></td>
<td>Australasia</td>
</tr>
<tr>
<td></td>
<td>States</td>
</tr>
<tr>
<td></td>
<td>size, factors affecting</td>
</tr>
<tr>
<td></td>
<td>sizers and sizing machines</td>
</tr>
<tr>
<td></td>
<td>sizing</td>
</tr>
<tr>
<td></td>
<td>See also grades and grading standards and standardization</td>
</tr>
<tr>
<td></td>
<td>California</td>
</tr>
<tr>
<td></td>
<td>Michigan</td>
</tr>
<tr>
<td></td>
<td>Northwestern states</td>
</tr>
<tr>
<td></td>
<td>North Carolina</td>
</tr>
<tr>
<td></td>
<td>Virginia</td>
</tr>
<tr>
<td></td>
<td>Washington</td>
</tr>
</tbody>
</table>
Apples - Continued
bibliography ... 54-55, 59, 174, 175, 213, 290, 292, 301, 304, 339, 376, 604
Illinois ............... 278
Maine .................. 324a
Massachusetts ........ 317, 613
New England ........ 450
New York ............ 35
Oklahoma .............. 98
Pacific Northwest ... 381, 419-420
Pennsylvania .......... 463
Rhode Island .......... 461
Vermont ............... 130, 134
Grand Isle County .... 583
See also cold storage; cool storage
summer apple industry
Coastal Plains region ... 201
tariff rates .......... 493, 511
trade marks .......... 233, 240-241
bibliography ......... 174-175
Maryland, Green Ridge Valley ................. 149
Massachusetts .......... 613
New Jersey ............ 367
Northwest ............. 324, 413
Pacific Coast .......... 127
Vermont ............... 470
See also shipping
unload - continued
United States - continued
cities and markets - continued
Kansas City .......... 511, 515
Minneapolis .......... 515
New York City ...... 511, 515
Philadelphia ....... 511, 515
Pittsburgh .......... 511, 515
St. Louis ............ 515
St. Paul ............. 515
Washington ......... 511, 515
states ............... 531, 534
Pacific Coast ........ 127
Virginia .......... 477, 511
Washington .......... 511
West Virginia ....... 511
Western States ...... 575
utilization of waste .... 460, 636
bibliography .......... 468
North Carolina ....... 358
Virginia .......... 13
See also by-products
value
United States .. 113, 432, 464, 494, 495, 509, 512, 518-519
states .... 206, 495, 509, 512
California .... 78, 509, 520
Iowa ................. 206
counties .......... 206
irrigated lands .... 494
Maine ............... 324a
Pennsylvania .... 16
Virginia, Frederick County .......... 472
Washington .......... 154
West Virginia Berkeley County .... 19
value per acre
Ohio .................. 30
Oregon, Hood River Valley .... 62
value per box
Oregon, Hood River Valley .... 62
bibliography .......... 722
<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apples - Continued</strong></td>
<td></td>
</tr>
<tr>
<td><strong>varieties - continued</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Alabama</strong></td>
<td>650,741</td>
</tr>
<tr>
<td><strong>Arizona</strong></td>
<td>380,657,807</td>
</tr>
<tr>
<td><strong>Arkansas</strong></td>
<td>768-770</td>
</tr>
<tr>
<td><strong>British provinces</strong></td>
<td>798</td>
</tr>
<tr>
<td><strong>California</strong></td>
<td>79,169,647,803</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>642,659</td>
</tr>
<tr>
<td><strong>Central Great Plains</strong></td>
<td>804</td>
</tr>
<tr>
<td><strong>Coastal Plains region</strong></td>
<td>201</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td>380,655,757,793</td>
</tr>
<tr>
<td><strong>Mesa County</strong></td>
<td>444</td>
</tr>
<tr>
<td><strong>Connecticut</strong></td>
<td>138</td>
</tr>
<tr>
<td><strong>Delaware</strong></td>
<td>143,632</td>
</tr>
<tr>
<td><strong>Georgia</strong></td>
<td>192,284,690,766</td>
</tr>
<tr>
<td><strong>Idaho</strong></td>
<td>380,791,803</td>
</tr>
<tr>
<td><strong>Illinois</strong></td>
<td>642,715-716,754</td>
</tr>
<tr>
<td><strong>Indiana</strong></td>
<td>67,486,610,717,747,783-784</td>
</tr>
<tr>
<td><strong>Lawrence County</strong></td>
<td>745</td>
</tr>
<tr>
<td><strong>Iowa</strong></td>
<td>629,639-641,664,695,718,720,732,759</td>
</tr>
<tr>
<td><strong>Mills County</strong></td>
<td>206</td>
</tr>
<tr>
<td><strong>Kansas</strong></td>
<td>255</td>
</tr>
<tr>
<td><strong>Kentucky</strong></td>
<td>137,673</td>
</tr>
<tr>
<td><strong>Maine</strong></td>
<td>153,324a,638,735-737</td>
</tr>
<tr>
<td><strong>Maryland</strong></td>
<td>96,694</td>
</tr>
<tr>
<td><strong>Green Ridge Valley</strong></td>
<td>149</td>
</tr>
<tr>
<td><strong>Massachusetts</strong></td>
<td>313,618,729,758,762,790,798</td>
</tr>
<tr>
<td><strong>Michigan</strong></td>
<td>658,668,691,723-725,730</td>
</tr>
<tr>
<td><strong>Minnesota</strong></td>
<td>683,726,772-774,801</td>
</tr>
<tr>
<td><strong>Mississippi</strong></td>
<td>749,802</td>
</tr>
<tr>
<td><strong>Missouri</strong></td>
<td>474,649,665,731,771</td>
</tr>
<tr>
<td><strong>Montana</strong></td>
<td>66,380,665</td>
</tr>
<tr>
<td><strong>Bitter Root Valley</strong></td>
<td>173</td>
</tr>
<tr>
<td><strong>Nebraska</strong></td>
<td>723,738</td>
</tr>
<tr>
<td><strong>Nevada</strong></td>
<td>696</td>
</tr>
<tr>
<td><strong>New Hampshire</strong></td>
<td>407,752</td>
</tr>
<tr>
<td><strong>New Jersey</strong></td>
<td>166,349,569,588-589,632-634,739</td>
</tr>
<tr>
<td><strong>Atlantic County</strong></td>
<td>186</td>
</tr>
<tr>
<td><strong>New Mexico</strong></td>
<td>187,380</td>
</tr>
<tr>
<td><strong>New York</strong></td>
<td>628,631,697-705,707,709-710,745</td>
</tr>
<tr>
<td><strong>Long Island</strong></td>
<td>742</td>
</tr>
<tr>
<td><strong>Niagara County</strong></td>
<td>129</td>
</tr>
<tr>
<td><strong>Wayne County</strong></td>
<td>578</td>
</tr>
<tr>
<td><strong>North Carolina</strong></td>
<td>358,360,714</td>
</tr>
<tr>
<td><strong>Northern Great Plains</strong></td>
<td>625</td>
</tr>
<tr>
<td><strong>Northwest</strong></td>
<td>361,692,782</td>
</tr>
<tr>
<td><strong>Ohio</strong></td>
<td>364,626,660-661,681-682,684-689,743</td>
</tr>
<tr>
<td><strong>Oklahoma</strong></td>
<td>98,635,733-734</td>
</tr>
<tr>
<td><strong>Oregon</strong></td>
<td>262,269,275,652-653,706,803</td>
</tr>
<tr>
<td><strong>Jackson County</strong></td>
<td>271</td>
</tr>
<tr>
<td><strong>Ozark region</strong></td>
<td>744</td>
</tr>
<tr>
<td><strong>Pennsylvania</strong></td>
<td>74,461,644-646,711</td>
</tr>
<tr>
<td><strong>Rhode Island</strong></td>
<td>119,461,753,755</td>
</tr>
<tr>
<td><strong>South Atlantic States</strong></td>
<td>679</td>
</tr>
<tr>
<td><strong>South Carolina</strong></td>
<td>740</td>
</tr>
<tr>
<td><strong>Southern Great Plains</strong></td>
<td>678</td>
</tr>
<tr>
<td><strong>Southern States</strong></td>
<td>667,785</td>
</tr>
<tr>
<td><strong>Tennessee</strong></td>
<td>137,794-795</td>
</tr>
<tr>
<td><strong>Utah</strong></td>
<td>380,563,789,803</td>
</tr>
<tr>
<td><strong>Vermont</strong></td>
<td>122,133,470,656,797,799</td>
</tr>
<tr>
<td><strong>Addison County</strong></td>
<td>585</td>
</tr>
<tr>
<td><strong>Grand Isle County</strong></td>
<td>583,800</td>
</tr>
<tr>
<td><strong>Virginia</strong></td>
<td>75,152,477,619-622,679,748</td>
</tr>
<tr>
<td><strong>Frederick County</strong></td>
<td>472</td>
</tr>
<tr>
<td><strong>Washington</strong></td>
<td>803</td>
</tr>
<tr>
<td><strong>West Virginia</strong></td>
<td>1,109,137</td>
</tr>
<tr>
<td><strong>Jefferson County</strong></td>
<td>246</td>
</tr>
<tr>
<td><strong>Western States</strong></td>
<td>667</td>
</tr>
<tr>
<td><strong>Western Washington</strong></td>
<td>763-765</td>
</tr>
<tr>
<td><strong>Wisconsin</strong></td>
<td>194,677,805-806</td>
</tr>
<tr>
<td><strong>Wyoming</strong></td>
<td>693,808</td>
</tr>
<tr>
<td><strong>varieties, susceptibility to blight, Montana</strong></td>
<td>627</td>
</tr>
<tr>
<td><strong>winter injury</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Maine</strong></td>
<td>295</td>
</tr>
<tr>
<td><strong>Michigan</strong></td>
<td>43</td>
</tr>
<tr>
<td><strong>yield per acre</strong></td>
<td></td>
</tr>
<tr>
<td><strong>California</strong></td>
<td>81</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td>517</td>
</tr>
<tr>
<td><strong>Idaho</strong></td>
<td>517</td>
</tr>
<tr>
<td><strong>Indiana, several orchards</strong></td>
<td>611</td>
</tr>
<tr>
<td><strong>Iowa, Mills County</strong></td>
<td>206</td>
</tr>
<tr>
<td><strong>irrigated lands</strong></td>
<td>474</td>
</tr>
<tr>
<td><strong>Montana, Bitter Root Valley</strong></td>
<td>173</td>
</tr>
<tr>
<td><strong>New York</strong></td>
<td>517</td>
</tr>
<tr>
<td><strong>Auchter Orchard</strong></td>
<td>219</td>
</tr>
<tr>
<td><strong>Niagara County</strong></td>
<td>129</td>
</tr>
<tr>
<td><strong>Orleans County</strong></td>
<td>575</td>
</tr>
<tr>
<td><strong>Wayne County</strong></td>
<td>578</td>
</tr>
<tr>
<td><strong>Ohio</strong></td>
<td>30</td>
</tr>
<tr>
<td><strong>Oregon</strong></td>
<td>517</td>
</tr>
<tr>
<td><strong>Hood River Valley</strong></td>
<td>62</td>
</tr>
<tr>
<td><strong>Jackson County</strong></td>
<td>271</td>
</tr>
</tbody>
</table>
### Apples - Continued

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>yield per acre - continued</td>
<td>yield per grower</td>
</tr>
<tr>
<td>Virginia</td>
<td>517</td>
</tr>
<tr>
<td>Frederick County</td>
<td>472</td>
</tr>
<tr>
<td>Washington</td>
<td>540,517</td>
</tr>
<tr>
<td>Wenatchee Valley</td>
<td>591</td>
</tr>
<tr>
<td>West Virginia</td>
<td>246</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>yield per grower</td>
<td></td>
</tr>
<tr>
<td>New York, Walworth</td>
<td>578</td>
</tr>
<tr>
<td>yield per tree</td>
<td></td>
</tr>
<tr>
<td>Indiana (orchards)</td>
<td>611</td>
</tr>
<tr>
<td>New Jersey</td>
<td>348</td>
</tr>
<tr>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>Auchter Orchard</td>
<td>219</td>
</tr>
<tr>
<td>Niagara County</td>
<td>129</td>
</tr>
<tr>
<td>Orleans County</td>
<td>575</td>
</tr>
<tr>
<td>Wayne County</td>
<td>578</td>
</tr>
<tr>
<td>Western Counties (3)</td>
<td>72</td>
</tr>
<tr>
<td>Ohio</td>
<td>162</td>
</tr>
<tr>
<td>Oregon, Hood River Valley</td>
<td>62</td>
</tr>
<tr>
<td>states having irrigation</td>
<td></td>
</tr>
<tr>
<td>projects</td>
<td>494</td>
</tr>
<tr>
<td>Vermont</td>
<td>1 orchard</td>
</tr>
<tr>
<td></td>
<td>counties</td>
</tr>
<tr>
<td></td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>470</td>
</tr>
<tr>
<td>Washington</td>
<td></td>
</tr>
<tr>
<td>Wenatchee Valley</td>
<td>591</td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
</tbody>
</table>

See also Orchard

### Apples, canned

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>84</td>
</tr>
<tr>
<td>exports, United States</td>
<td>493-494, 520,579</td>
</tr>
<tr>
<td>New Jersey</td>
<td>350</td>
</tr>
<tr>
<td>production and value</td>
<td>115,494,558</td>
</tr>
<tr>
<td>United States</td>
<td>579</td>
</tr>
<tr>
<td>United States</td>
<td>340</td>
</tr>
</tbody>
</table>

### Apples, dried

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>exports, United States</td>
<td>84,158, 334,432,479,493-494,511,517-522, 558,578-579</td>
</tr>
<tr>
<td>grading and packing</td>
<td>76</td>
</tr>
<tr>
<td>imports, United States</td>
<td>559,562</td>
</tr>
<tr>
<td>industry</td>
<td>California, Pajaro Valley</td>
</tr>
<tr>
<td>New York</td>
<td>579</td>
</tr>
<tr>
<td>United States</td>
<td>579</td>
</tr>
<tr>
<td>marketing of California fruit in Europe</td>
<td>82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples, dried - Continued</td>
<td>prices</td>
</tr>
<tr>
<td>United States</td>
<td>559,578</td>
</tr>
<tr>
<td>New York</td>
<td>562</td>
</tr>
<tr>
<td>production</td>
<td>California</td>
</tr>
<tr>
<td>New York</td>
<td>578</td>
</tr>
<tr>
<td>North Carolina</td>
<td>578</td>
</tr>
<tr>
<td>Oregon</td>
<td>578</td>
</tr>
<tr>
<td>Tennessee</td>
<td>578</td>
</tr>
<tr>
<td>United States</td>
<td>115,494,553, 562</td>
</tr>
<tr>
<td>shipments</td>
<td>United States</td>
</tr>
<tr>
<td>Arizona</td>
<td>532</td>
</tr>
<tr>
<td>California</td>
<td>532</td>
</tr>
<tr>
<td>Nevada</td>
<td>532</td>
</tr>
<tr>
<td>states and counties</td>
<td>505-506</td>
</tr>
<tr>
<td>Virginia</td>
<td>12</td>
</tr>
<tr>
<td>value, United States</td>
<td>115,494,558</td>
</tr>
<tr>
<td>Apricots</td>
<td>3,86,271,435,580,653, 754,803</td>
</tr>
<tr>
<td>Apricots, dried</td>
<td>158</td>
</tr>
<tr>
<td>Arizona. Agricultural experiment station</td>
<td>657</td>
</tr>
<tr>
<td>Arkansas. Agricultural experiment station</td>
<td>572,767-770</td>
</tr>
<tr>
<td>Arkansas. University. College of agriculture. Extension</td>
<td></td>
</tr>
<tr>
<td>service</td>
<td>224,807</td>
</tr>
<tr>
<td>Arkansas state horticultural society</td>
<td>571</td>
</tr>
<tr>
<td>Armentrout, W. W.</td>
<td>17</td>
</tr>
<tr>
<td>Armstrong, M. D.</td>
<td>340</td>
</tr>
<tr>
<td>Artman, C. E</td>
<td>404-405</td>
</tr>
<tr>
<td>Asparagus</td>
<td>3</td>
</tr>
<tr>
<td>Atwell, H. C</td>
<td>616</td>
</tr>
<tr>
<td>Atwood, G. A</td>
<td>18</td>
</tr>
<tr>
<td>Auchter, E. C</td>
<td>19-21,184</td>
</tr>
<tr>
<td>Auction houses as distributors</td>
<td>351</td>
</tr>
<tr>
<td>Bailey, L. H</td>
<td>22-23</td>
</tr>
<tr>
<td>Baird, W. P</td>
<td>625</td>
</tr>
<tr>
<td>Baker, C. E</td>
<td>24</td>
</tr>
<tr>
<td>Baker, O. E</td>
<td>25</td>
</tr>
<tr>
<td>Ball, E. D</td>
<td>26</td>
</tr>
<tr>
<td>Ballard, W. R</td>
<td>27-28</td>
</tr>
<tr>
<td>Ballou, F. H</td>
<td>29-30,626,686</td>
</tr>
<tr>
<td>Bancroft, Raymond</td>
<td>627</td>
</tr>
<tr>
<td>Barley</td>
<td>3,253,338</td>
</tr>
<tr>
<td>Barnett, R. J</td>
<td>31</td>
</tr>
</tbody>
</table>
Barringer, Mrs. J. H. .................................. 719
Barron, J. H. ........................................ 73
Bassett, A. K. ........................................ 32
Bassett, C. E. ......................................... 33
Batcham, A. F. ........................................ 378
Beach, F. H. ........................................... 34
Beach, S. A. ........................................ 23, 35, 165, 351, 354, 628-631
Beans ....................................................... 3
Beans, field ........................................... 253, 333
Beans, lima ........................................... 3
Beattie, W. R. .......................................... 113
Bearth, M. H. ........................................... 632
Beets, stock and sugar ................................ 3, 253, 320, 338
Bell, J. O. ........................................... 36-37
Bennett, S. L. .......................................... 271
Berckmans, P. J. ....................................... 38
Berkeley county horticultural society ........ 136
Berries ................................................ 186, 464, 669
See also Blackberries; Dewberries; Gooseberries; Logaberries; Raspberries; Strawberries
Berst, K. H. ........................................... 321
Bertush, W. J. ......................................... 531
Bigelow, W. D. ......................................... 39
Bird, H. S. ............................................. 40
Blackberries ............................................ 273, 619, 635, 712, 734, 735, 774
See also Berries
Blair, J. C. ............................................ 41
Blake, M. A. ........................................... 633-354
Bliss, G. R. ........................................... 664
Boggs, G. E. .......................................... 360
Booth, N. O. .......................................... 628, 635, 709
Border, U. Grant ..................................... 293
Boree, B. C. ........................................... 561
Boston market gardeners' association ........ 320
Bouis, C. E. ............................................ 144
Brackett, G. B. ...................................... 42, 635-637
Bradford, F. C. ....................................... 43
Brayton, A. W. ....................................... 44, 454
Brierley, W. G. ....................................... 45-50
Brock, R. C. ........................................... 100
Brooks, C. D. ........................................... 184
Brooks, C. F. ........................................... 25
Brooks, Charles ..................................... 51-60
Brown, B. S. .......................................... 61, 633
Brown, C. L. .......................................... 531
Brown, G. C. .......................................... 62
Bruce, P. A. .......................................... 63
Bruner, T. K. .......................................... 358
Budd, J. L. ........................................... 639-642
Bureau of railway economics ................ 64-65
Burkholder, C. L. ................................... 66-67
Burrill, T. J. .......................................... 643
Burritt, M. C. ......................................... 62-73, 351, 354
Burroughe, A. M. ................................... 301
Burton, Mr. ........................................... 746
Butter ............................................... 36-37, 507, 516
Butterfat ............................................ 123
Butz, G. C. ........................................... 74, 644-646
Byrd, H. F. ........................................... 75
Cabbage ............................................. 3, 65, 117, 515-516
Caldwell, J. S. ....................................... 76
California. Agricultural experiment station 86-87, 376, 499, 647
California. Dept. of agriculture ............... 77, 416
California. State commission of horticulture 78-85, 169, 248, 475, 476, 590, 803
California. University. College of agriculture ........................................ 86-87
Callanan, V. D. ....................................... 531
Calves ............................................... 123
Campfield, W. S. ..................................... 88
Canadian fruit mark act of 1901 ................. 252, 267
Cantaloupes ......................................... 65, 515
Cardinell, H. A. ...................................... 43
Cardwell, J. R. ....................................... 89
Carpenter, C. C. ..................................... 648
Carpenter, G. L. S. ................................ 184
Carrick, D. B. ........................................ 90-91
Carroll, J. M. ........................................ 378
Carrots ............................................... 320
Carter, W. F., jr. ................................... 92
Case, B. J. ........................................... 93
Cashmere fruit growers' union .................... 324
Catchpole, E. W. .................................... 351, 354
Cattle ................................................. 123
Celery ............................................... 65, 471, 515
Central state normal school [Mich.] ........... 351
Chandler, W. H. ................................... 295
Cheese ........................................... 36-37, 507, 560
Chenoweth, W.W. ................................... 649
Cherries . 3, 93, 271, 272, 435, 468, 580, 592, 619, 634-655, 683, 694, 699, 712-713, 718, 720, 734-735, 764-766, 774, 782, 803, 808
Cheshire County [N. H.] farm bureau ...................................................................................... 424
Chickens ............................................. 111
Chickens ............................................. 123, 613
See also Poultry
Cider .................................................. 13
Cider .................................................. 197
cold storage ........................................... 46
exports, United States ............................... 479
prices
New York, Niagara county 129
production, United States ..... 579
Clark, A. L. ........................................... 94, 589
Clark, V. A. ........................................... 35, 95, 510
Clayton, J. ............................................. 550
Clement & Taylor ...................................... 153
Clemson agricultural college
See South Carolina, Clemson agricultural college
Climate ............................................. 114, 135, 286
Canada ............................................... 204
Colorado, Fremont County .......................... 435
Maryland, Green Ridge Valley. 149
New Jersey .......................................... 166
South Atlantic States ............................... 679
Virginia ............................................. 679
See also Temperature and rainfall
Close, C. P. ......................................... 27, 96
Cobb, M. A. ......................................... 651
Cochran, G. A. ....................................... 97
Cochran, G. W. ...................................... 98
Cohill, E. P. ........................................... 96
Cole, C. A. ........................................... 100, 616
Cole, W. R. ........................................... 101-103, 317
Colorado. Agricultural college
Extension service ...................................... 531
Colorado. Agricultural experiment station 434-439, 655, 757, 793
Colorado. Director of markets . 104
Colorado. State board of horticulture .............. 517
Colorado inspection service .......................... 104
Columbus horticultural society ................... 141, 721
Commission selling, New York ........................ 351
Conn, J. H. .......................................... 105
Connecticut (Storrs) Agricultural experiment station .............................. 138, 242
Connecticut agricultural college
Extension service ...................................... 138
Connor, L. G. ....................................... 106
Conolly, H. M. ....................................... 72
Conrad, D. B. ........................................ 107
Cooley, J. S. ......................................... 53-60
goons, G. H. ......................................... 108
Cooperation ......................................... 195, 282, 601
See also Apples, cooperative marketing
Coote, George ...................................... 652-653
Corbett, L. C. ...................................... 109-115
Corbett, R. B. ....................................... 116-119
Corn ................................................. 3, 123, 186, 253, 338, 440, 472
Corn silage ......................................... 253, 338
Cornell university. See New York
Cornell university
Cost of motor truck work .......................... 253
Cost of tractor and horse power ........................ 253
Costello, Timothy .................................... 121
Cotton, E. C. ......................................... 122
Cotton ................................................. 3, 253, 338
Cowan, D. R. C. ..................................... 123
Crab apples
age of trees, Washington, counties and districts 580
culture, Virginia ..................................... 623
dates of blooming .................................... 415
industry, Montana, Bitter Root Valley 173
number of trees
Pennsylvania ........................................ 387
Washington counties and districts 580
varieties 180, 642, 708
Canada ............................................... 642
Iowa ................................................. 718
Michigan ........................................... 773
Minnesota ........................................... 669
Missouri ............................................. 665
Montana ............................................. 663, 666
New York .......................................... 745
North Carolina ..................................... 714
Northern Great Plains ............................. 625
Oklahoma ............................................ 635
Oregon ............................................... 653
Virginia ............................................. 620, 623, 748
Craig, John ......................................... 124, 129, 575, 578, 654
Craig, Moses ........................................ 125
<table>
<thead>
<tr>
<th>Item</th>
<th>Crandall, C. S.</th>
<th>126,655</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crandall, W. A.</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Crane, H. L.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cricher, A. L.</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Crosby, C. R.</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Crosby, H. T.</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Crossen, E. P.</td>
<td>405</td>
</tr>
<tr>
<td></td>
<td>Cummings, M. B.</td>
<td>129-134,585,656</td>
</tr>
<tr>
<td></td>
<td>Cunningham, J. C.</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Currants ... 273,619,734-725,774,803</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dacy, A. L.</td>
<td>6,136</td>
</tr>
<tr>
<td></td>
<td>Dairy products</td>
<td>549</td>
</tr>
<tr>
<td></td>
<td>Darrow, G. M.</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>Darrow, W. H.</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Davis, H. B.</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>Davis, V. H.</td>
<td>135-141</td>
</tr>
<tr>
<td></td>
<td>Delaware. Agricul-ture station</td>
<td>632</td>
</tr>
<tr>
<td></td>
<td>Delaware. State board of agriculture</td>
<td>142-143,303,446,491</td>
</tr>
<tr>
<td></td>
<td>Dennis, S. J.</td>
<td>419</td>
</tr>
<tr>
<td></td>
<td>DeVault, S. H.</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Devol, W. S.</td>
<td>657</td>
</tr>
<tr>
<td></td>
<td>Dewberries</td>
<td>635</td>
</tr>
<tr>
<td></td>
<td>See also Berries</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dickens, Albert</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>Diederich, A. L.</td>
<td>146,367</td>
</tr>
<tr>
<td></td>
<td>Diehl, H. C.</td>
<td>147,290-292</td>
</tr>
<tr>
<td></td>
<td>Dixon, H. M.</td>
<td>106,148,469,484</td>
</tr>
<tr>
<td></td>
<td>Donnell, H. V.</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>Dosch, H. E.</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Dow, H. H.</td>
<td>658</td>
</tr>
<tr>
<td></td>
<td>Downing, F. P.</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>Drinkard, A. W., jr</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>Dudley, F. H.</td>
<td>153,294</td>
</tr>
<tr>
<td></td>
<td>Dumas, J. L.</td>
<td>659</td>
</tr>
<tr>
<td></td>
<td>Dunnefer, E. F.</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>Dunlap, H. M.</td>
<td>155-157</td>
</tr>
<tr>
<td></td>
<td>Durst, C. E.</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>Dutton, C. A.</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>Dyer, W. A.</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>Eaton, S. H.</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Eberle, F. L.</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>Edlefsen, N. D.</td>
<td>593</td>
</tr>
<tr>
<td></td>
<td>Edwards, P. K.</td>
<td>377</td>
</tr>
<tr>
<td></td>
<td>Eggs . 36-37,123,186,294,507,516,613</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See also Poultry products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eldridge, J. E.</td>
<td>379</td>
</tr>
<tr>
<td></td>
<td>Ellenwood, C. W. 162,660-681,681,682</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elliott, F. R.</td>
<td>662</td>
</tr>
<tr>
<td></td>
<td>Emery, S. M.</td>
<td>663</td>
</tr>
<tr>
<td></td>
<td>English, M. J.</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Erwin, A. T.</td>
<td>664</td>
</tr>
<tr>
<td></td>
<td>Eustace, H. J.</td>
<td>163-165,214</td>
</tr>
<tr>
<td></td>
<td>Evergreens</td>
<td>738</td>
</tr>
<tr>
<td></td>
<td>Evers, J. D.</td>
<td>531</td>
</tr>
<tr>
<td></td>
<td>Exhibits ... 31,396,601</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illinois selection for</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>C. M.</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Farm products</td>
<td>166-167</td>
</tr>
<tr>
<td></td>
<td>Farms and investements, size</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Idaho, Payette Valley</td>
<td>487</td>
</tr>
<tr>
<td></td>
<td>Faurot, F. W.</td>
<td>665</td>
</tr>
<tr>
<td></td>
<td>Favor, E. H.</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>Faxon, Richard</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>Federal fruit and cold storage co. of New Orleans</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>Femmons, Frank</td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>Filley, J. L.</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Field crops</td>
<td>338</td>
</tr>
<tr>
<td></td>
<td>Fig.</td>
<td>3,766</td>
</tr>
<tr>
<td></td>
<td>Filinger, G. A.</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Filley, H. C.</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>Fish</td>
<td>37,507,516,549</td>
</tr>
<tr>
<td></td>
<td>Fisher, D. F.</td>
<td>56-60,172</td>
</tr>
<tr>
<td></td>
<td>Fisher, R. W.</td>
<td>173,666</td>
</tr>
<tr>
<td></td>
<td>Fitzke, G. B.</td>
<td>174,175</td>
</tr>
<tr>
<td></td>
<td>Fitz, J. W.</td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>Fitz, James</td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>Fitzhugh, William</td>
<td>663</td>
</tr>
<tr>
<td></td>
<td>Fletcher, S. W.</td>
<td>176,177,668</td>
</tr>
<tr>
<td></td>
<td>Fletcher, W. F.</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>Flowers</td>
<td>733</td>
</tr>
<tr>
<td></td>
<td>Fogle, P. E.</td>
<td>307</td>
</tr>
<tr>
<td></td>
<td>Foley, H. A.</td>
<td>554</td>
</tr>
<tr>
<td></td>
<td>Folger, J. C.</td>
<td>178,179</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>consumption, Atlantic City, N. J.</td>
<td>186</td>
</tr>
<tr>
<td></td>
<td>Food and drugs act</td>
<td>240-241</td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>495</td>
</tr>
<tr>
<td></td>
<td>Franklin, I. C.</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Franklin, M. L.</td>
<td>334</td>
</tr>
<tr>
<td></td>
<td>Fraser, Samuel</td>
<td>180,395</td>
</tr>
<tr>
<td></td>
<td>Froehlich, Paul</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>Frosts, dates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Idaho, Payette Valley</td>
<td>487</td>
</tr>
<tr>
<td></td>
<td>Iowa</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Middle Atlantic States</td>
<td>201</td>
</tr>
<tr>
<td>Item</td>
<td>Fruit - Continued</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>North Carolina</td>
<td>714</td>
</tr>
<tr>
<td>Item</td>
<td>Northwestern States</td>
<td>782</td>
</tr>
<tr>
<td>Item</td>
<td>Ohio</td>
<td>141, 158-163, 282, 285, 286, 288</td>
</tr>
<tr>
<td>Item</td>
<td>Oklahoma</td>
<td>635, 734</td>
</tr>
<tr>
<td>Item</td>
<td>Oregon</td>
<td>89, 150, 273, 273, 652-653, 672, 803</td>
</tr>
<tr>
<td>Item</td>
<td>Pacific Coast</td>
<td>127, 303</td>
</tr>
<tr>
<td>Item</td>
<td>Pennsylvania</td>
<td>645, 711</td>
</tr>
<tr>
<td>Item</td>
<td>Rhode Island</td>
<td>119, 753, 755</td>
</tr>
<tr>
<td>Item</td>
<td>Providence</td>
<td>116</td>
</tr>
<tr>
<td>Item</td>
<td>South Atlantic States</td>
<td>679</td>
</tr>
<tr>
<td>Item</td>
<td>Southern Great Plains</td>
<td>678</td>
</tr>
<tr>
<td>Item</td>
<td>St.</td>
<td>578</td>
</tr>
<tr>
<td>Item</td>
<td>Tennessee</td>
<td>137, 795-796</td>
</tr>
<tr>
<td>Item</td>
<td>Utah</td>
<td>380, 563, 789</td>
</tr>
<tr>
<td>Item</td>
<td>Utah Lake Valley</td>
<td>19</td>
</tr>
<tr>
<td>Item</td>
<td>Provo Area</td>
<td>106, 484</td>
</tr>
<tr>
<td>Item</td>
<td>Virginia</td>
<td>679, 748</td>
</tr>
<tr>
<td>Item</td>
<td>Washington</td>
<td>580-581, 803</td>
</tr>
<tr>
<td>Item</td>
<td>West Virginia</td>
<td>17, 19, 137</td>
</tr>
<tr>
<td>Item</td>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>Item</td>
<td>Western Washington</td>
<td>763-765</td>
</tr>
<tr>
<td>Item</td>
<td>Wisconsin</td>
<td>677, 805</td>
</tr>
<tr>
<td>Item</td>
<td>Wyoming</td>
<td>692, 808</td>
</tr>
<tr>
<td>Item</td>
<td>Fruit, canned</td>
<td>115, 158, 282, 285, 558, 579</td>
</tr>
<tr>
<td>Item</td>
<td>New Jersey</td>
<td>350</td>
</tr>
<tr>
<td>Item</td>
<td>Oregon</td>
<td>373</td>
</tr>
<tr>
<td>Item</td>
<td>Fruit, dried</td>
<td>15, 180-181, 282, 558, 560, 578-579</td>
</tr>
<tr>
<td>Item</td>
<td>California</td>
<td>578</td>
</tr>
<tr>
<td>Item</td>
<td>New York</td>
<td>578</td>
</tr>
<tr>
<td>Item</td>
<td>5 counties</td>
<td>578</td>
</tr>
<tr>
<td>Item</td>
<td>North Carolina</td>
<td>578</td>
</tr>
<tr>
<td>Item</td>
<td>Oregon</td>
<td>373, 578</td>
</tr>
<tr>
<td>Item</td>
<td>Tennessee</td>
<td>578</td>
</tr>
</tbody>
</table>

Fruit, evaporated. See Fruit, dried

Fruit and vegetable transportation association of the East and West. 182

Fruit beverages. 158

Fruit growers' associations.

Oregon. 270

Fruit growers' conference. 183-184, 453

Fruit-juice. 115

Oregon. 373

Fulton, B. B. 185

Fulton, S. H. 412

Funk, W. C. 185
Georgia, Agricultural experiment station ................................ 766
Georgia State college of agriculture .................................. 192,284
Georgia state horticultural society .................................. 674-675,690
Gerber, O. M. .................................................................. 193
Gerhardt, Fisk .................................................................. 400
Gerrey, L. B. .................................................................. 531
Gibb, Charles .................................................................. 676
Goff, E. S. .................................................................. 194,677
Goodman, L. A. .................................................................. 195-196
Gooseberries, 273,619,635,735, 774-803
See also Berries
Gore, H. C. .................................................................. 39,197
Gossard, H. A. .................................................................. 198
Gould, H. P. .................................................................. 113,199-203,673,630
Gourley, J. H. .................................................................. 204,681,682
Grabs, W. F. .................................................................. 360
Graham, J. P. .................................................................. 205
Grain sorghums .................................................................. 338
Grape-fruits .................................................................. 65,158,423
Grapes .................................................................. 3,65,93,158,186,266,270, 273,279,372,394,471,580,592,619, 630,635,642,653,662,669,672,699, 712,718,734-735,774-775,793
See also Vineyards
Green, S. B. .................................................................. 683
Green, W. J. .................................................................. 684-689
Greene, Laurenz .................................................................. 206-209
Haher, E. M. .................................................................. 690
Hainsworth, R. C. .......................................................... 25
Halliburton, E. D. .................................................................. 210
Hall, F. H. .................................................................. 710
Hall, M. B. .................................................................. 259
Hall, Mary .................................................................. 506
Hallor, M. H. .................................................................. 291
Hallman, C. P. .................................................................. 691
Hanemann, H. A. .................................................................. 383
Hansen, H. F. .................................................................. 211
Hansen, N. E. .................................................................. 642,692
Harkey, F. L. .................................................................. 212
Harris, H. A. .................................................................. 532
Harris, M. D. .................................................................. 693
Harrison, C. H. .......................................................... 694
Harrell, L. R. .................................................................. 695
Hartman, Henry .................................................................. 213,427
Hartman, S. B. .......................................................... 214
Harwood, R. W. .................................................................. 316
Hawkins, L. A. .................................................................. 28
Hay .................................................................. 3,123,234,253,338,472,495
Heacock, F. J. .................................................................. 216
Headley, F. B. .................................................................. 696
Hedden, W. P. .................................................................. 402-404
Hedrick, U. P. .................................................................. 217-220,351,354, 697-710
Herron, L. C. .................................................................. 221
Hetzol, H. C. .................................................................. 222-223
Hiester, Gabriel .................................................................. 711
Hodson, E. A. .................................................................. 224
Hogs .................................................................. 123,230,367
Horticultural organizations................................................. 610
Indiana .................................................................. 201,227,427,456,491,
Hume, H. A. .................................................................. 229
Hunter, Byron .................................................................. 230
Hutt, W. N. .................................................................. 231-233,714
Idaho, Agricultural experiment station ................................ 252,791
Idaho. Dept. of agriculture ................................................. 234-236
Illinois. Agricultural experiment station ................................ 277,643,712
Illinois state horticultural society ........................................ 4,41,44,126,155,218,
276-278,410,454,459,715-716,754
Indiana, Agricultural experiment station ................................ 252,307,322,349, 323,363,456, 717
International apple shippers association .. 180, 239-241, 395
Iowa, Agricultural experiment station .. 165, 206, 208, 397-398, 400, 41, 598, 629, 639-641, 720
Iowa, State college of agriculture and mechanic arts.
Botanical dept. ..... 393, 664
Iowa state horticultural society .. 286, 393, 695, 718, 732, 759
Jacob, H. E. ............ 376
Jarvis, C. D. ............ 23, 242
Jay, R. D. ............ 243
Jefferson, L. P. .... 244-245, 313, 618
Jeffries, R. R. .... 246
Jenkins, E. W. .... 133
Jenks, A. R. .... 247, 317
Jerome, F. S. .... 248
Johnson, W. G. .... 719
Johnston, R. B. .... 249
Jones, B. B. .... 250
 Judson, L. B. .... 251-252
Juve, O. A. .... 253, 338
Kaffir and milo .... 253
Kaiser, W. G. .... 254
Kansas state horticultural society .. 157-158, 170, 255-257, 289, 343, 396, 399
Keil, J. B. .... 258, 637-689
Kentucky, Agricultural experiment station .... 673
Keyser, H. L. .... 293
Killough, J. H. .... 351
Kimball, C. W. .... 351
Kinsey, F. S. .... 382
Kitchen, C. W. .... 259
Knapp, H. B. .... 260, 351, 601
Knudson, W. W. .... 563
Koppen, W. J. .... 49-50
Kraft, Henry .... 322
Labor .... 135
 Washington, Wenatchee Valley .... 451
Lake, E. R. .... 261-262
Lamb, S. F. .... 373
Lemmon, H. H. .... 263, 421
Lantz, H. L. .... 720
Lard .... 37, 507, 549
Latimer, L. P. .... 408
Lawrence, W. H. .... 265
Lazenby, W. R. .... 266, 721
Lemons .... 3, 65, 158
Leslie, W. R. .... 722
Lettuce .... 65, 320
Lewis, C. I. .... 267-273
Lewis, I. P. .... 30, 274
Lewis, W. J. .... 275
Lima beans. See Beans
Limbocker, T. F. .... 434
Lincoln, L. B. .... 613
Livestock .... 472
Livezey, J. R. .... 332
Lloyd, J. W. .... 276-278
Loganberries .... 635
See also Berries
Lombard, P. M. .... 134
Loquats .... 775
Loree, R. E. .... 723
Low, Aaron .... 279
Luce, W. A. .... 341
Luedtke, C. L. .... 280
Lupton, S. L. .... 281-283
Lyon, T. T. .... 724-725
McCall, T. M. .... 726
McCarthy, Gerald .... 358, 360
McCluer, G. W. .... 643
McCourt, W. E. .... 578
McElheny, V. K., jr. .... 351
McElroy, M. S. .... 727
McGinty, R. A. .... 434
McHatton, T. H. .... 284
McKay, A. W. .... 285
Macoun, W. T. .... 23, 286
Magness, J. R. .... 28, 184, 287-292, 301
Maine, Agricultural experiment station .... 324a, 344, 735-737
Maine, Dept. of agriculture .... 153, 188, 293-295, 299
Maine, University, Agricultural extension service .... 638
Malcbeuf, C. A. .... 296-298
Maney, T. J. .... 397-400
Mango .... 775
Mann, C. W. .... 299
Marble, L. M. .... 300
Marble laboratory, inc., Canton, Pa .... 300-301
<table>
<thead>
<tr>
<th>Item</th>
<th>Maryland, Agricultural experiment station</th>
<th>27,96,144,233</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Maryland, State college of agriculture. Agricultural extension service</td>
<td>473</td>
</tr>
<tr>
<td>Item</td>
<td>Maryland agricultural society.</td>
<td>222,492,694</td>
</tr>
<tr>
<td>Item</td>
<td>Mason, A. F.</td>
<td>310</td>
</tr>
<tr>
<td>Item</td>
<td>Mason, R. P.</td>
<td>311</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts Agricultural college. Extension service</td>
<td>10,443,762,790</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts Agricultural experiment station</td>
<td>214-245,313,614,760-761</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts (Hatch) Agricultural experiment station</td>
<td>312,723</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts Dept. of agriculture</td>
<td>102,247,314-231,618</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts State board of agriculture</td>
<td>616,758,793</td>
</tr>
<tr>
<td>Item</td>
<td>Massachusetts horticultural society</td>
<td>279,286</td>
</tr>
<tr>
<td>Item</td>
<td>Massey, W. F.</td>
<td>358</td>
</tr>
<tr>
<td>Item</td>
<td>Massey, W. P.</td>
<td>565</td>
</tr>
<tr>
<td>Item</td>
<td>Mathews, V. H.</td>
<td>322-323</td>
</tr>
<tr>
<td>Item</td>
<td>Maynard, H. H.</td>
<td>324</td>
</tr>
<tr>
<td>Item</td>
<td>Maynard, S. T.</td>
<td>729</td>
</tr>
<tr>
<td>Item</td>
<td>Meat</td>
<td>37,507,549,560</td>
</tr>
<tr>
<td>Item</td>
<td>Melons</td>
<td>505</td>
</tr>
<tr>
<td>Item</td>
<td>Merchant, C. H.</td>
<td>324a</td>
</tr>
<tr>
<td>Item</td>
<td>Meriam, E.</td>
<td>85</td>
</tr>
<tr>
<td>Item</td>
<td>Merrill, F. S.</td>
<td>474</td>
</tr>
<tr>
<td>Item</td>
<td>Michigan Dept. of agriculture. Bureau of foods and standards</td>
<td>531</td>
</tr>
<tr>
<td>Item</td>
<td>Michigan state horticultural society</td>
<td>120,159,305,322,573</td>
</tr>
<tr>
<td>Item</td>
<td>Miller, D. G.</td>
<td>326</td>
</tr>
<tr>
<td>Item</td>
<td>Miller, G. H.</td>
<td>327-330,465-487</td>
</tr>
<tr>
<td>Item</td>
<td>Miller, H. B.</td>
<td>331</td>
</tr>
<tr>
<td>Item</td>
<td>Minnesota. Agricultural experiment station</td>
<td>45-46,50,683,726</td>
</tr>
<tr>
<td>Item</td>
<td>Minnesota. University</td>
<td>49</td>
</tr>
<tr>
<td>Item</td>
<td>Minnesota state horticultural society</td>
<td>211,669</td>
</tr>
<tr>
<td>Item</td>
<td>Mississippi. Agricultural and mechanical college. Agricultural extension dept.</td>
<td>802</td>
</tr>
<tr>
<td>Item</td>
<td>Mississippi. Agricultural experiment station</td>
<td>749</td>
</tr>
<tr>
<td>Item</td>
<td>Missouri. Agricultural experiment station</td>
<td>123,474,731</td>
</tr>
<tr>
<td>Item</td>
<td>Missouri. State board of agriculture</td>
<td>670</td>
</tr>
<tr>
<td>Item</td>
<td>Missouri. State board of horticulture</td>
<td>649</td>
</tr>
<tr>
<td>Item</td>
<td>Missouri. State fruit experiment station</td>
<td>665,714,771</td>
</tr>
<tr>
<td>Item</td>
<td>Mitchell, J. E.</td>
<td>732</td>
</tr>
<tr>
<td>Item</td>
<td>Mobley, R. H.</td>
<td>332</td>
</tr>
<tr>
<td>Item</td>
<td>Monroe, J. F.</td>
<td>768</td>
</tr>
<tr>
<td>Item</td>
<td>Montana. Agricultural experiment station</td>
<td>318,663,666</td>
</tr>
<tr>
<td>Item</td>
<td>Montana horticultural society</td>
<td>40,193,401,433,609,627</td>
</tr>
<tr>
<td>Item</td>
<td>Montreal horticultural society</td>
<td>677</td>
</tr>
<tr>
<td>Item</td>
<td>Moorman, C. W.</td>
<td>333-335,504</td>
</tr>
<tr>
<td>Item</td>
<td>Moorman, S. B.</td>
<td>336</td>
</tr>
<tr>
<td>Item</td>
<td>Moorhouse, H. W.</td>
<td>337</td>
</tr>
<tr>
<td>Item</td>
<td>Moorhouse, L. A.</td>
<td>338</td>
</tr>
<tr>
<td>Item</td>
<td>Moorhouse, L. A.</td>
<td>338</td>
</tr>
<tr>
<td>Item</td>
<td>Mooring, D. C.</td>
<td>635,733</td>
</tr>
<tr>
<td>Item</td>
<td>Morris, O. M.</td>
<td>339-341,734</td>
</tr>
<tr>
<td>Item</td>
<td>Morse, F. W.</td>
<td>342,421</td>
</tr>
<tr>
<td>Item</td>
<td>Moses Fell annex farm</td>
<td>24</td>
</tr>
<tr>
<td>Item</td>
<td>Motor truck rates, New Jersey</td>
<td>367</td>
</tr>
<tr>
<td>Item</td>
<td>Motz, F. A.</td>
<td>343,379</td>
</tr>
<tr>
<td>Item</td>
<td>Mules</td>
<td>367</td>
</tr>
<tr>
<td>Item</td>
<td>Munson, W. A.</td>
<td>317</td>
</tr>
<tr>
<td>Item</td>
<td>Munson, W. M.</td>
<td>344,735-737</td>
</tr>
<tr>
<td>Item</td>
<td>National league of commission merchants of the United States</td>
<td>395</td>
</tr>
<tr>
<td>Item</td>
<td>Naylor, Mrs. Mary</td>
<td>63</td>
</tr>
<tr>
<td>Item</td>
<td>Nebraska. Agricultural experiment station</td>
<td>171</td>
</tr>
<tr>
<td>Item</td>
<td>Nebraska state horticultural society</td>
<td>145,460,728,738</td>
</tr>
<tr>
<td>Item</td>
<td>Neller, J. R.</td>
<td>345</td>
</tr>
</tbody>
</table>
Nelson, Ray .................................. 108
New England research council .... 321, 407, 613
New Hampshire. Agricultural ex-
periment station .................................. 263, 342, 407, 421, 424, 599, 613, 752
New Hampshire. College of agri-
culture. Extension service ........... 608
New Hampshire. Dept. of agri-
culture ......................................... 346-347, 569
New Hampshire. University. Ex-
tension service ......................... 408, 424, 430
New Hampshire horticultural
society .................................... 607
New Jersey. Agricultural experi-
ment station .................................. 166, 185, 348, 349, 568, 634
New Jersey. Agricultural exten-
sion service ................................ 186
New Jersey. Bureau of markets .... 539
New Jersey. Bureau of statistics
and inspection ............................. 539
New Jersey. Bureau of statistics
labor and industries ................. 350
New Jersey. Dept. of agricul-
ture ...................................... 94, 146, 365, 367, 586-589
New Jersey state agricultural
college .................................... 633
New Jersey state horticultural
society ...................................... 116, 281, 739
New Mexico. Agricultural experi-
ment station ................................ 187
New York (State) Agricultural ex-
periment station ......................... 35, 163-164, 183, 217-220, 628, 697-705, 707, 709-710, 723
New York. Cornell. Agricultural
experiment station ..................... 22, 90, 117, 129, 260, 309, 574-576, 578, 603
New York. Cornell university. State college of agricul-
ture .................................. 91, 336, 429, 579, 745
New York. Dept. of agriculture .... 93, 121, 351-353, 628
New York. Dept. of farms and
markets .................................. 354-356, 531
New York central lines .............. 357, 423
New York fruit exchange .......... 233
New York state fruit growers' Associ-
ation ...................................... 223, 260, 283, 457
New York state horticultural so-
ciety ....................................... 564
Newman, C. C. ......................... 740
Newman, J. S. ......................... 741
Normal day's work for various
operations .................................. 518
North Carolina. Agricultural ex-
periment station ......................... 231, 358-359
North Carolina. Dept. of agricul-
ture ...................................... 229, 447, 714
North Carolina. State board of
agriculture ................................ 360
North Pacific fruit distributors 83
Northwestern fruit exchange, Seattle, Wash. ............. 361
Norwegian American chamber of
commerce .................................. 362
Nostrand, P. E. ........................ 742
Nuckols, S. B. ......................... 230
Nursery industry ....................... 563
Nursery men and dealers, number
of licensed, Pennsylvania .......... 387
Nursery stock laws, Maine .......... 133
Nuts .................................. 113, 285, 562, 642, 669, 674
Oats .................................. 3, 123, 253, 338
Odell, F. I. ......................... 363
Ohio. Agricultural commission,
Bureau of nursery and orchard
inspection .................................. 445
Ohio. Agricultural experiment
Ohio. Dept. of agriculture .......... 123, 365, 445, 592
Ohio. State university. Agricul-
tural college ............................ 635
Ohio state horticultural soci-
ety .................................... 139-140, 218, 222
Oklahoma. Agricultural and mechani-
cal college. Extension divi-
sion .................................. 98, 337, 733
Oklahoma. Agricultural experiment
station .................................. 635, 734
Oley, R. C. ......................... 366-367
Item

Olives 3
Onions 3, 36, 320, 365, 403, 515-516
Oranges 3, 36, 153, 403, 423
Orchards
  age, West Virginia
    Jefferson County 246
  age of trees
    Colorado
      Fremont County 435
    Northeastern District 437
    Maine 324
    Maryland, Allegany County 149
    Massachusetts 613
    New Hampshire 407
    New Jersey 538
    New York
      Niagara County 129
      Wayne County 578
    Ohio counties 592
    Oregon, Jackson County 271
    Rhode Island 119
    Utah 563
    Virginia, Frederick County 472
    Washington 530
    West Virginia 110
  cost of cultivation
    Indiana 611
    Ohio 30
  cost of dusting
    New York 128
  cost of establishing and maintaining 425, 490, 497
    California, Butte County 35
    Colorado 436
    Idaho, Payette Valley 487
    Indiana 27, 363, 611
    Maryland 27, 96
    New York 69-71
    Ohio 140, 162, 364, 445
    Oregon 150
    Hood River Valley 485
    Washington
      Wenatchee Valley 329
      West Virginia 136
  cost of fertilizing
    Indiana 611
  cost of operating
    Indiana 611
    New York 327-328
  cost of cropping
    Idaho, Payette Valley 487

Orchards - Continued

  cost of pruning
    Idaho, Payette Valley 487
    Indiana 611
  cost of renovating
    New York 72
    Broome County 73
    Wayne County 578
  cost of spraying
    Colorado, Mesa County 434
    Idaho, Payette Valley 487
    Indiana 611
    New York 128
  regions (6 leading regions) 179
    West Virginia
      Berkeley County 19
  cost of thinning
    Idaho, Payette Valley 487
    West Virginia 20
  cover crops
    bibliography 468
    Maine, Kennebec County 344
    Oregon 262, 273
    Rhode Island 461
  crowding
    341
  distribution
    Colorado, Fremont County 435
    New York, Ontario County 309
    West Virginia
      Jefferson County 246
  drainage
    New York, Niagara County 273
    Oregon, Jackson County 271
  fertilization
    bibliography 7, 220, 464, 468
    Maine, Kennebec County 344
    Montana
      Bitter Root Valley 173
      New York (western) 22
      Niagara County 129
      1 orchard 220
      Oregon 273
      Jackson County 271
    Pennsylvania 465, 467
    Rhode Island 461
    West Virginia
      Jefferson County 246
  fertilization, relation to yields and incomes
    New York
      Niagara County 129
<table>
<thead>
<tr>
<th>Item</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchards - Continued</td>
<td>161</td>
</tr>
<tr>
<td>fertilization, relation to yields and incomes - continued</td>
<td></td>
</tr>
<tr>
<td>New York - continued</td>
<td></td>
</tr>
<tr>
<td>Wayne County</td>
<td>578</td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>fillers</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>618</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>407</td>
</tr>
<tr>
<td>financial records</td>
<td>216</td>
</tr>
<tr>
<td>New York, 1 orchard</td>
<td>217-219</td>
</tr>
<tr>
<td>Ohio, 2 orchards</td>
<td>198</td>
</tr>
<tr>
<td>Utah</td>
<td>563</td>
</tr>
<tr>
<td>Vermont, Grand Isle County (1 orchard)</td>
<td>583</td>
</tr>
<tr>
<td>West Virginia, 6 orchards</td>
<td>6</td>
</tr>
<tr>
<td>grafting</td>
<td>109,184</td>
</tr>
<tr>
<td>bibliography</td>
<td>468</td>
</tr>
<tr>
<td>Maine, Kennecet County</td>
<td>344</td>
</tr>
<tr>
<td>grass mulch, Ohio</td>
<td>162</td>
</tr>
<tr>
<td>See also tillage</td>
<td></td>
</tr>
<tr>
<td>heating</td>
<td>96</td>
</tr>
<tr>
<td>bibliography</td>
<td>593</td>
</tr>
<tr>
<td>Utah</td>
<td>593</td>
</tr>
<tr>
<td>income</td>
<td>214</td>
</tr>
<tr>
<td>New York</td>
<td>72</td>
</tr>
<tr>
<td>Broome County</td>
<td>73</td>
</tr>
<tr>
<td>Orleans County</td>
<td>575</td>
</tr>
<tr>
<td>Western</td>
<td>579</td>
</tr>
<tr>
<td>Virginia</td>
<td></td>
</tr>
<tr>
<td>Frederick County</td>
<td>472</td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>income, sources, Massachusetts</td>
<td>618</td>
</tr>
<tr>
<td>income per acre</td>
<td></td>
</tr>
<tr>
<td>Iowa, Mills County</td>
<td>206</td>
</tr>
<tr>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>Niagara County</td>
<td>129</td>
</tr>
<tr>
<td>1 orchard</td>
<td>121</td>
</tr>
<tr>
<td>Orleans County</td>
<td>575</td>
</tr>
<tr>
<td>Wayne County</td>
<td>578</td>
</tr>
<tr>
<td>income per tree</td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>intercropping</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>351,354</td>
</tr>
<tr>
<td>Virginia, Frederick County</td>
<td>472</td>
</tr>
<tr>
<td>irrigation</td>
<td></td>
</tr>
<tr>
<td>bibliography</td>
<td>468</td>
</tr>
<tr>
<td>Oregon</td>
<td>273</td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Orchards - Continued</td>
<td></td>
</tr>
<tr>
<td>labor and material requirements</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>Ontario County</td>
<td>300</td>
</tr>
<tr>
<td>Wayne County</td>
<td>124</td>
</tr>
<tr>
<td>Ohio</td>
<td>162,364</td>
</tr>
<tr>
<td>Oregon</td>
<td>261-262,273</td>
</tr>
<tr>
<td>Hood River Valley</td>
<td>62</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>755</td>
</tr>
<tr>
<td>West Virginia</td>
<td>110</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>management, relation to yields and incomes</td>
<td></td>
</tr>
<tr>
<td>New York, Ontario County</td>
<td>309</td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>number</td>
<td>14</td>
</tr>
<tr>
<td>Colorado, Northeastern district</td>
<td>437</td>
</tr>
<tr>
<td>Illinois</td>
<td>237</td>
</tr>
<tr>
<td>Iowa, Mills County</td>
<td>206</td>
</tr>
<tr>
<td>Maryland, Allegany County</td>
<td>149</td>
</tr>
<tr>
<td>New York (western counties)</td>
<td>72</td>
</tr>
<tr>
<td>Orleans County</td>
<td>575</td>
</tr>
<tr>
<td>Ohio counties</td>
<td>592</td>
</tr>
<tr>
<td>number of trees</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>14,114,340,423</td>
</tr>
<tr>
<td>Colorado</td>
<td></td>
</tr>
<tr>
<td>Mesa County</td>
<td>434</td>
</tr>
<tr>
<td>Fremont County</td>
<td>435</td>
</tr>
<tr>
<td>Northeastern Dist.</td>
<td>437</td>
</tr>
<tr>
<td>Kansas counties</td>
<td>255</td>
</tr>
<tr>
<td>Maine</td>
<td>324a</td>
</tr>
<tr>
<td>Maryland</td>
<td></td>
</tr>
<tr>
<td>Allegany County</td>
<td>149</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>321,618</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>424,430</td>
</tr>
<tr>
<td>Item</td>
<td>Orchards - Continued</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>number of trees (bearing) - cont.</td>
</tr>
<tr>
<td></td>
<td>United States - continued</td>
</tr>
<tr>
<td></td>
<td>Virginia .......... 472,477,564</td>
</tr>
<tr>
<td></td>
<td>Frederick County ..... 472</td>
</tr>
<tr>
<td></td>
<td>Washington .......... 564</td>
</tr>
<tr>
<td></td>
<td>West Virginia ....... 137</td>
</tr>
<tr>
<td></td>
<td>number of trees (nonbearing)</td>
</tr>
<tr>
<td></td>
<td>United States ...... 321,495,517</td>
</tr>
<tr>
<td></td>
<td>California .......... 84,225</td>
</tr>
<tr>
<td></td>
<td>Connecticut ......... 130</td>
</tr>
<tr>
<td></td>
<td>Iowa, counties ...... 206</td>
</tr>
<tr>
<td></td>
<td>Kansas .......... 256-257</td>
</tr>
<tr>
<td></td>
<td>-counties .......... 255-257</td>
</tr>
<tr>
<td></td>
<td>Kentucky .......... 137</td>
</tr>
<tr>
<td></td>
<td>Massachusetts ....... 331</td>
</tr>
<tr>
<td></td>
<td>New England ......... 321</td>
</tr>
<tr>
<td></td>
<td>New Hampshire ....... 408</td>
</tr>
<tr>
<td></td>
<td>districts .......... 424</td>
</tr>
<tr>
<td></td>
<td>New Jersey .......... 348,588</td>
</tr>
<tr>
<td></td>
<td>New York .......... 321,564</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania ....... 16,387</td>
</tr>
<tr>
<td></td>
<td>Rhode Island ...... 118</td>
</tr>
<tr>
<td></td>
<td>States and geographical divisions ...... 199,206,495-496</td>
</tr>
<tr>
<td></td>
<td>Tennessee .......... 137</td>
</tr>
<tr>
<td></td>
<td>Vermont ...........</td>
</tr>
<tr>
<td></td>
<td>Grand Isle County ...... 583</td>
</tr>
<tr>
<td></td>
<td>Virginia .......... 477,564</td>
</tr>
<tr>
<td></td>
<td>Washington .......... 564</td>
</tr>
<tr>
<td></td>
<td>West Virginia ....... 137</td>
</tr>
<tr>
<td></td>
<td>number of trees per acre</td>
</tr>
<tr>
<td></td>
<td>New York</td>
</tr>
<tr>
<td></td>
<td>Niagara County ....... 129</td>
</tr>
<tr>
<td></td>
<td>Wayne County .......... 578</td>
</tr>
<tr>
<td></td>
<td>number of trees planted, Utah ..... 563</td>
</tr>
<tr>
<td></td>
<td>number rented and owned</td>
</tr>
<tr>
<td></td>
<td>New York</td>
</tr>
<tr>
<td></td>
<td>Niagara County ....... 129</td>
</tr>
<tr>
<td></td>
<td>Wayne County .......... 578</td>
</tr>
<tr>
<td></td>
<td>plantings</td>
</tr>
<tr>
<td></td>
<td>New Jersey .......... 589</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania .......... 74</td>
</tr>
<tr>
<td></td>
<td>Vermont .......... 131</td>
</tr>
<tr>
<td></td>
<td>West Virginia, Berkeley Co. ..... 19</td>
</tr>
<tr>
<td></td>
<td>profits ...... 161,168,216,269,497,601</td>
</tr>
<tr>
<td></td>
<td>Minnesota .......... .47, 49</td>
</tr>
<tr>
<td></td>
<td>New York .......... 361,354</td>
</tr>
<tr>
<td></td>
<td>Auchter ........ 218-219</td>
</tr>
<tr>
<td></td>
<td>1 orchard .......... 72</td>
</tr>
<tr>
<td></td>
<td>pruning .......... 42,45,184,344,497</td>
</tr>
<tr>
<td></td>
<td>bibliography .......... 468</td>
</tr>
<tr>
<td></td>
<td>Indiana .......... 610</td>
</tr>
<tr>
<td>State/Region</td>
<td>Item</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Orchards - Continued</strong></td>
<td></td>
</tr>
<tr>
<td><strong>pruning - continued</strong></td>
<td></td>
</tr>
<tr>
<td>Iowa, Mills County</td>
<td>206</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>313</td>
</tr>
<tr>
<td>Michigan</td>
<td>774</td>
</tr>
<tr>
<td>Montana, Bitter Root Valley</td>
<td>173</td>
</tr>
<tr>
<td>New York</td>
<td>228</td>
</tr>
<tr>
<td><strong>Niagara County</strong></td>
<td>129</td>
</tr>
<tr>
<td>North Carolina</td>
<td>358</td>
</tr>
<tr>
<td>Ohio</td>
<td>364</td>
</tr>
<tr>
<td>Oregon</td>
<td>262,273</td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Ozark region</td>
<td>571</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>74</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>Utah</td>
<td>563</td>
</tr>
<tr>
<td>Vermont</td>
<td>470</td>
</tr>
<tr>
<td><strong>West Virginia</strong></td>
<td></td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td><strong>renovation</strong></td>
<td>72,214</td>
</tr>
<tr>
<td><strong>bibleography</strong></td>
<td>72,468</td>
</tr>
<tr>
<td>Indiana</td>
<td>610-611</td>
</tr>
<tr>
<td>Maine, Kennebec County</td>
<td>344</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>317</td>
</tr>
<tr>
<td>New England</td>
<td>242</td>
</tr>
<tr>
<td>New York</td>
<td>73</td>
</tr>
<tr>
<td><strong>Broome County</strong></td>
<td>72</td>
</tr>
<tr>
<td>Ohio</td>
<td>30</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>Vermont</td>
<td>133</td>
</tr>
<tr>
<td>West Virginia</td>
<td>6</td>
</tr>
<tr>
<td><strong>site. See location and site</strong></td>
<td></td>
</tr>
<tr>
<td><strong>size</strong></td>
<td></td>
</tr>
<tr>
<td>Colorado, Mesa County</td>
<td>434</td>
</tr>
<tr>
<td>Virginia, Frederick County</td>
<td>472</td>
</tr>
<tr>
<td><strong>West Virginia</strong></td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td><strong>size, bearing</strong></td>
<td></td>
</tr>
<tr>
<td>Maine</td>
<td>324a</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>618</td>
</tr>
<tr>
<td><strong>sod mulch</strong></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>217-219</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>456</td>
</tr>
<tr>
<td><strong>See also tillage</strong></td>
<td></td>
</tr>
<tr>
<td><strong>spray residue removal</strong></td>
<td>427</td>
</tr>
<tr>
<td><strong>spraying</strong></td>
<td>184,214, 243</td>
</tr>
<tr>
<td><strong>bibliography</strong></td>
<td>468</td>
</tr>
<tr>
<td>Idaho, Fayette Valley</td>
<td>437</td>
</tr>
<tr>
<td><strong>Indiana</strong></td>
<td>610</td>
</tr>
<tr>
<td>Iowa, Mills County</td>
<td>206</td>
</tr>
<tr>
<td><strong>Orchards - Continued</strong></td>
<td></td>
</tr>
<tr>
<td><strong>spraying - continued</strong></td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>313</td>
</tr>
<tr>
<td>New York (western)</td>
<td>22</td>
</tr>
<tr>
<td><strong>Niagara County</strong></td>
<td>129</td>
</tr>
<tr>
<td>Ohio (3 orchards)</td>
<td>198</td>
</tr>
<tr>
<td>Oregon</td>
<td>273</td>
</tr>
<tr>
<td>Ozark region</td>
<td>571</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>Utah</td>
<td>563</td>
</tr>
<tr>
<td>Vermont</td>
<td>470</td>
</tr>
<tr>
<td><strong>Addison County</strong></td>
<td>585</td>
</tr>
<tr>
<td><strong>Grand Isle County</strong></td>
<td>583</td>
</tr>
<tr>
<td><strong>Virginia</strong></td>
<td>75,622</td>
</tr>
<tr>
<td><strong>West Virginia</strong></td>
<td></td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>spraying, relation to yield and</td>
<td></td>
</tr>
<tr>
<td>income, New York</td>
<td></td>
</tr>
<tr>
<td><strong>Niagara County</strong></td>
<td>129</td>
</tr>
<tr>
<td><strong>Wayne County</strong></td>
<td>578</td>
</tr>
<tr>
<td>surveys</td>
<td></td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>423</td>
</tr>
<tr>
<td>United States</td>
<td>179,423</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
</tr>
<tr>
<td>Arkansas Valley</td>
<td>436</td>
</tr>
<tr>
<td>district</td>
<td></td>
</tr>
<tr>
<td>Fremont County</td>
<td>435</td>
</tr>
<tr>
<td>Mosa County</td>
<td>424</td>
</tr>
<tr>
<td>Northeastern dist.</td>
<td>437</td>
</tr>
<tr>
<td>Southwestern dist.</td>
<td>423</td>
</tr>
<tr>
<td>Western district</td>
<td>431</td>
</tr>
<tr>
<td><strong>Iowa, Mills County</strong></td>
<td>206</td>
</tr>
<tr>
<td><strong>Minnesota</strong></td>
<td>49</td>
</tr>
<tr>
<td>Montana, Bitter Root Valley</td>
<td>173</td>
</tr>
<tr>
<td>New Jersey</td>
<td>587-589,633</td>
</tr>
<tr>
<td><strong>New York</strong></td>
<td></td>
</tr>
<tr>
<td>Niagara County</td>
<td>129</td>
</tr>
<tr>
<td>Ontario County</td>
<td>309</td>
</tr>
<tr>
<td>Orleans County</td>
<td>575</td>
</tr>
<tr>
<td>Wayne County</td>
<td>124,578</td>
</tr>
<tr>
<td>Oregon</td>
<td></td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Wasco County</td>
<td>270</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>16</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>119</td>
</tr>
<tr>
<td>Utah</td>
<td>563</td>
</tr>
<tr>
<td>Washington</td>
<td>580</td>
</tr>
<tr>
<td><strong>West Virginia</strong></td>
<td></td>
</tr>
<tr>
<td>Berkeley County</td>
<td>19</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
</tbody>
</table>
**Orchards - Continued**

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>thining</td>
<td>423</td>
</tr>
<tr>
<td>bibliography</td>
<td>20, 466</td>
</tr>
<tr>
<td>Oregon</td>
<td>273</td>
</tr>
<tr>
<td>Hood River Valley</td>
<td>62</td>
</tr>
<tr>
<td>Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>West Virginia</td>
<td>20</td>
</tr>
<tr>
<td>See also grass mulch; sod mulch</td>
<td></td>
</tr>
</tbody>
</table>

Oregon. Agricultural experiment station .. 62, 128, 313, 221, 261-262, 267, 269-273, 327, 382-383, 706
Oregon. State board of horticulture .. 150, 331, 368-372
Oregon state horticultural society .. 89, 296, 298, 373, 449, 596, 782
Oskamp, Joseph .. 31, 744-747
Overholser, E. L. .. 87, 374-376
Overley, F. L. .. 345
Overton, M. H. .. 377
Pacific horticultural correspondence school, Portland, Oreg. .. 265, 376
Package sales corporation .. 379
Paddock, Wendell .. 380
Palthorp, R. R. .. 175, 381-384
Palmer, W. R. .. 385
Pan American scientific congress .. 333
Par, J. W. .. 383
Parsons, F. E. .. 477
Peacock, N. D. .. 284
Pennsylvania. Agricultural experiment station .. 74, 463, 465-466, 645
Pennsylvania. Dept. of agriculture .. 16, 587, 391, 468, 614, 711
Pennsylvania state college .. 16, 464, 467, 644, 646
Pennsylvania state college. School of agriculture and experiment station. Dept. of agricultural extension .. 310, 392
Perry, Winifred .. 393
Phillips, J. L. .. 394
Phillips, R. G. .. 395
Fickett, W. F. .. 396
Pineapples .. 471
Piper, C. .. 673
Piper, W. H., jr. .. 318-319
Flagge, H. H. .. 397-400
Platt, A. V. .. 401
Fond, G. A. .. 50
Port of New York authority .. 402-405
Porter, G. C. .. 224
Potatoes .. 3, 65, 115, 234, 253, 277, 294, 320, 338, 365, 390, 403, 495, 515-516, 613
Potter, G. F. .. 406-408
Poultry .. 36, 186, 507, 516, 560
See also Chickens, etc.
Poultry products .. 549
Powell, G. H. .. 165, 409-412
Powell, G. T. .. 353
Pratt, B. B. .. 413
Pratt, B. G. .. 100
Price, H. C. .. 414
Price, H. L. .. 415, 623, 748
<table>
<thead>
<tr>
<th>Item</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price, J. C. C.</td>
<td>749</td>
</tr>
<tr>
<td>Prince, G. E.</td>
<td>531</td>
</tr>
<tr>
<td>Prugh, A. E.</td>
<td>531</td>
</tr>
<tr>
<td>Prunes</td>
<td>3150, 158, 234, 270-271, 273, 371-372, 435, 580, 653, 706</td>
</tr>
<tr>
<td>Purdom, J. M.</td>
<td>148</td>
</tr>
<tr>
<td>Purdue experiment station. See Indiana. Agricultural experiment station</td>
<td></td>
</tr>
<tr>
<td>Purdue university. Dept. of agricultural extension</td>
<td>66, 747</td>
</tr>
<tr>
<td>Putnam, J. E.</td>
<td>729</td>
</tr>
<tr>
<td>Quinces</td>
<td>468, 592, 619-620, 634-635</td>
</tr>
<tr>
<td>Ragan, W. H</td>
<td>750-751</td>
</tr>
<tr>
<td>Raisins</td>
<td>158</td>
</tr>
<tr>
<td>Ralston, G. S.</td>
<td>379, 417</td>
</tr>
<tr>
<td>Remsey, H. J.</td>
<td>418-420</td>
</tr>
<tr>
<td>Rene, P. W.</td>
<td>421, 752</td>
</tr>
<tr>
<td>Raspberries</td>
<td>275, 619, 635, 699, 734-735, 774, 808</td>
</tr>
<tr>
<td>Rhode Island. Agricultural experiment station</td>
<td>116, 118-119, 755</td>
</tr>
<tr>
<td>Rhode Island. State board of agriculture</td>
<td>461, 755</td>
</tr>
<tr>
<td>Rice</td>
<td>3</td>
</tr>
<tr>
<td>Richards, H. I.</td>
<td>17, 424, 613</td>
</tr>
<tr>
<td>Richards, N. W.</td>
<td>425, 611</td>
</tr>
<tr>
<td>Richards, W. M.</td>
<td>610</td>
</tr>
<tr>
<td>Richardson, George</td>
<td>255</td>
</tr>
<tr>
<td>Riehl, E. H.</td>
<td>754</td>
</tr>
<tr>
<td>Rinn, A. G.</td>
<td>426</td>
</tr>
<tr>
<td>Roadside markets. See Markets, roadside</td>
<td></td>
</tr>
<tr>
<td>Robinson, F. B.</td>
<td>184</td>
</tr>
<tr>
<td>Robinson, R. H.</td>
<td>427</td>
</tr>
<tr>
<td>Roeding, G. C.</td>
<td>428</td>
</tr>
<tr>
<td>Rogers, E. H.</td>
<td>499</td>
</tr>
<tr>
<td>Rogers, F. E.</td>
<td>429</td>
</tr>
<tr>
<td>Rollins, H. A.</td>
<td>407-408, 424, 430</td>
</tr>
<tr>
<td>Root crops</td>
<td>277</td>
</tr>
<tr>
<td>Rose, D. H.</td>
<td>431</td>
</tr>
<tr>
<td>Rothenberger, J. H.</td>
<td>256</td>
</tr>
<tr>
<td>Ruddiman, H. D.</td>
<td>432</td>
</tr>
<tr>
<td>Russell, L. W.</td>
<td>755</td>
</tr>
<tr>
<td>Russian apple nomenclature commission</td>
<td>756</td>
</tr>
<tr>
<td>Rye</td>
<td>253, 338</td>
</tr>
<tr>
<td>Sackett, W. M.</td>
<td>433</td>
</tr>
<tr>
<td>Samson, H. W.</td>
<td>285, 384</td>
</tr>
<tr>
<td>Sandsten, E. P.</td>
<td>434-439, 757</td>
</tr>
<tr>
<td>Sarle, C. F.</td>
<td>440, 513-514</td>
</tr>
<tr>
<td>Schooley, P. T.</td>
<td>379</td>
</tr>
<tr>
<td>Scott, W. M.</td>
<td>441-442</td>
</tr>
<tr>
<td>Scroggs, F. H.</td>
<td>531</td>
</tr>
<tr>
<td>Sears, F. C.</td>
<td>317, 443-444, 758</td>
</tr>
<tr>
<td>Secor, Eugene</td>
<td>759</td>
</tr>
<tr>
<td>Seed</td>
<td>234, 253</td>
</tr>
<tr>
<td>Seed firms, Indiana</td>
<td>610</td>
</tr>
<tr>
<td>Seibel, J. E.</td>
<td>111</td>
</tr>
<tr>
<td>Seifert, E. M. Jr.</td>
<td>336</td>
</tr>
<tr>
<td>Shaw, J. K.</td>
<td>313, 760-762</td>
</tr>
<tr>
<td>Shaw, W. E.</td>
<td>445</td>
</tr>
<tr>
<td>Shaw, S. B.</td>
<td>446-447, 473, 714</td>
</tr>
<tr>
<td>Shay, O. B.</td>
<td>448</td>
</tr>
<tr>
<td>Sheep</td>
<td>123</td>
</tr>
<tr>
<td>Shepard, C. H.</td>
<td>267, 293, 449</td>
</tr>
<tr>
<td>Sheehan, E.</td>
<td>450</td>
</tr>
<tr>
<td>Sherman, O. B.</td>
<td>336</td>
</tr>
<tr>
<td>Shields, E. F.</td>
<td>451</td>
</tr>
<tr>
<td>Shoemaker, R. H.</td>
<td>531</td>
</tr>
<tr>
<td>Shrubs</td>
<td>663, 726, 738</td>
</tr>
<tr>
<td>Simpson, E. H.</td>
<td>452-453</td>
</tr>
<tr>
<td>Simpson, R. A.</td>
<td>454</td>
</tr>
<tr>
<td>Smith, C. B.</td>
<td>455</td>
</tr>
<tr>
<td>Snyder, W. P.</td>
<td>456</td>
</tr>
<tr>
<td>Society for horticultural science</td>
<td>135, 204, 425, 804</td>
</tr>
<tr>
<td>Society for the promotion of agricultural science</td>
<td>266</td>
</tr>
<tr>
<td>Soil and soil management</td>
<td>42, 114, 135, 184, 273, 428, 601</td>
</tr>
<tr>
<td>Colorado, Fremont County</td>
<td>435</td>
</tr>
<tr>
<td>Connecticut</td>
<td>600</td>
</tr>
<tr>
<td>Illinois</td>
<td>643</td>
</tr>
<tr>
<td>Iowa</td>
<td>718</td>
</tr>
<tr>
<td>Mills County</td>
<td>206</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>600</td>
</tr>
<tr>
<td>Michigan</td>
<td>658</td>
</tr>
<tr>
<td>Missouri loess area</td>
<td>206</td>
</tr>
<tr>
<td>New Jersey</td>
<td>166, 349</td>
</tr>
<tr>
<td>Oregon, Jackson County</td>
<td>271</td>
</tr>
<tr>
<td>Soil and soil management - Cont.</td>
<td>Item</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>16,74</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>461</td>
</tr>
<tr>
<td>Virginia</td>
<td>75,622</td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>Soils, relation to yields and incomes</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>Niagara County</td>
<td>129</td>
</tr>
<tr>
<td>Wayne County</td>
<td>578</td>
</tr>
<tr>
<td>West Virginia</td>
<td>137</td>
</tr>
<tr>
<td>Berkeley County</td>
<td>15</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>246</td>
</tr>
<tr>
<td>Sorghum</td>
<td>3</td>
</tr>
<tr>
<td>South Carolina. Agricultural experiment station</td>
<td>740</td>
</tr>
<tr>
<td>South Carolina. Clemson agricul-tural college</td>
<td>212</td>
</tr>
<tr>
<td>South Dakota. Agricultural experiment station</td>
<td>692</td>
</tr>
<tr>
<td>Spillman, W. J.</td>
<td>457</td>
</tr>
<tr>
<td>Spilman, H. A.</td>
<td>161,184</td>
</tr>
<tr>
<td>Stafford, I. B.</td>
<td>643</td>
</tr>
<tr>
<td>Stahl, J. L.</td>
<td>763-765</td>
</tr>
<tr>
<td>Stanford, H. R.</td>
<td>459</td>
</tr>
<tr>
<td>Starnes, H. N.</td>
<td>766</td>
</tr>
<tr>
<td>Steinhart, J. W.</td>
<td>460</td>
</tr>
<tr>
<td>Stene, A. E.</td>
<td>461</td>
</tr>
<tr>
<td>Stewart, E. L.</td>
<td>462</td>
</tr>
<tr>
<td>Stewart, J. P.</td>
<td>463-468</td>
</tr>
<tr>
<td>Stewart, M. M.</td>
<td>335</td>
</tr>
<tr>
<td>Stinson, J. T.</td>
<td>767-771</td>
</tr>
<tr>
<td>Strait, E. D.</td>
<td>439</td>
</tr>
<tr>
<td>Strawberries</td>
<td>65,158,266,270,273,394,515,580,619,635,735,774,808</td>
</tr>
<tr>
<td>See also Berries</td>
<td></td>
</tr>
<tr>
<td>Stuart, William</td>
<td>470</td>
</tr>
<tr>
<td>Stubenrauch, A. V.</td>
<td>471</td>
</tr>
<tr>
<td>Sutton, R. L.</td>
<td>531</td>
</tr>
<tr>
<td>Swarthout, A. V.</td>
<td>105</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>3,65,186,516</td>
</tr>
<tr>
<td>Swinson, C. R.</td>
<td>472</td>
</tr>
<tr>
<td>Symons, T. B.</td>
<td>473</td>
</tr>
<tr>
<td>Taft, L. R.</td>
<td>772-774</td>
</tr>
<tr>
<td>Talbert, T. J.</td>
<td>474</td>
</tr>
<tr>
<td>Tate, A. W.</td>
<td>475</td>
</tr>
<tr>
<td>Tate, A. W., jr.</td>
<td>476</td>
</tr>
<tr>
<td>Taylor, H. M.</td>
<td>477</td>
</tr>
<tr>
<td>Taylor, O. M.</td>
<td>628,709</td>
</tr>
<tr>
<td>Taylor, R. H.</td>
<td>375</td>
</tr>
<tr>
<td>Taylor, W. A.</td>
<td>23,478-481,775-780</td>
</tr>
<tr>
<td>Temperature and rainfall</td>
<td>415</td>
</tr>
<tr>
<td>Idaho, Fayette Valley</td>
<td>487</td>
</tr>
<tr>
<td>Iowa</td>
<td>718</td>
</tr>
<tr>
<td>Kingston, N. C., Seaford, Del., and Moorestown, N. J.</td>
<td>201</td>
</tr>
<tr>
<td>See also Climate</td>
<td></td>
</tr>
<tr>
<td>Tennessee. Agricultural experiment station</td>
<td>794-796</td>
</tr>
<tr>
<td>Tenny, L. S.</td>
<td>499</td>
</tr>
<tr>
<td>Terminal facilities, New York</td>
<td>404</td>
</tr>
</tbody>
</table>

**See also Transportation facilities**

| Thatcher, R. W.                  | 482  |
| Thyer, Paul                      | 483,687-689|
| Thomas, H. H.                    | 781  |
| Thompson, J. C.                  | 255  |
| Thomson, E. H.                   | 71,106,484|
| Thomson, S. M.                   | 179,329,330,485-487|
| Thornber, W. S.                  | 782  |
| Tobacco                         | 253,333|
| Tomatoes                         | 3,65,112,266,320,484,515|
| Tompkins, C. M.                  | 435-439|
| Transportation facilities        | 161  |
| Idaho                            | 561  |
| New Jersey, Atlantic City        | 186  |
| Oregon                           | 561  |
| Washington                       | 561  |
| See also Terminal facilities     |      |
| Trees                            | 726,739|
| Troop, James                     | 428,733-734|
| Truck crops                      | 186,233,253|
| Tucker, H. M.                    | 294  |
| Tufts, W. P.                     | 489  |
| Turkey, H. B.                    | 220  |
| Turkeys                          | 613  |

**See also Poultry**

| Twitchell, G. M.                 | 490  |
| Tyson, C. J.                     | 491-492|

<p>| U. S. Bureau of foreign and domestic commerce | 127,493-494|
| U. S. Bureau of the census              | 495-496|
| U. S. Commissioner of patents           | 497  |
| U. S. Congress. House. Committee on coinage, weights &amp; measures | 498-503|</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. S. Dept. of agriculture 21, 25, 28</td>
<td>Vickers, H. A. 272</td>
</tr>
<tr>
<td>U. S. Interstate commerce commission 561</td>
<td>U. S. Pomologist 706</td>
</tr>
<tr>
<td>U. S. Shipping board 511</td>
<td>U. S. War industries board 562</td>
</tr>
<tr>
<td>Utah. Agricultural experiment station 2, 593</td>
<td>Utah. State board of horticulture 789</td>
</tr>
<tr>
<td>Utah. State horticultural commission 563</td>
<td>Utah. State board of horticulture 789</td>
</tr>
<tr>
<td>Van Buren, B. D. 351, 354, 564</td>
<td>Van Meter, R. A. 790</td>
</tr>
<tr>
<td>Vaughan, C. C. 325</td>
<td>Vaughan, C. C. 325</td>
</tr>
<tr>
<td>bibliography 146</td>
<td>Walker, Ernest 571-572</td>
</tr>
<tr>
<td>California 81</td>
<td>Walker, Jacob 63</td>
</tr>
<tr>
<td>Colorado 104</td>
<td>Wallace-Taylor, A. J. 111</td>
</tr>
<tr>
<td>Great Britain 554</td>
<td>Waller, A. G. 186</td>
</tr>
<tr>
<td>Maryland 144</td>
<td>Walnuts 3</td>
</tr>
<tr>
<td>New Jersey 146, 367</td>
<td>Ward, C. M. 513-514</td>
</tr>
<tr>
<td>Atlantic County 186</td>
<td>Ward, H. E. 294</td>
</tr>
<tr>
<td>New York (western) 117</td>
<td>Warder, J. A. 792</td>
</tr>
<tr>
<td>Oregon 652</td>
<td>Warner, Frank 120, 573</td>
</tr>
<tr>
<td>Pacific Coast 127</td>
<td>Warren, G. F. 574-579</td>
</tr>
<tr>
<td>Rhode Island 116</td>
<td>Waring, J. H. 16</td>
</tr>
<tr>
<td>Tennessee 795</td>
<td>Washington. Agricultural experiment station 31, 76, 154, 177, 339, 341, 345, 615</td>
</tr>
<tr>
<td>Vegetables, canned 115, 558</td>
<td>Washington (State) Dept. of agriculture 580-581</td>
</tr>
<tr>
<td>Vegetables, dried 115, 181, 285, 558</td>
<td>Washington state horticultural association 381, 449, 659</td>
</tr>
<tr>
<td>Vermont. Agricultural experiment station 132</td>
<td>Watermelons 55</td>
</tr>
</tbody>
</table>
Watrous, F. L. ........................................ 793
Watts, R. L. ........................................... 794-796
Waugh, F. A. ............................................ 582-585, 797-800
Waugh, F. V. ............................................. 586
Weiss, H. B. ........................................... 587-589
Weldon, G. P. .......................................... 590
Wellington, Richard ................................. 301
Welsh, F. S. ............................................. 351
Wenatchee Valley traffic association ................. 591
West, C. J. .............................................. 592
West, F. L. .............................................. 593
West Virginia. Agricultural experiment station. 5-7, 17, 19-20, 109-111, 136, 246
West Virginia. College of agriculture. Extension department .................................................. 1
West Virginia. Dept. of agriculture ...................... 8, 349, 594
West Virginia state horticultural society ................. 70
Western fruit jobbers association ...................... 395
Western New York horticultural society ............... 124, 251, 650-661
Western Washington. Agricultural experiment station 763-765
Wheat .................................................. 3, 123, 253, 338, 390, 472
Wheeler, Wilfred ....................................... 317
Whipple, C. B. ......................................... 23, 380
Whisler, C. E. ......................................... 596
White, C. N. ............................................. 294
White, E. F. ............................................. 602
White, H. L. ............................................. 317
White service, ltd. .................................... 597
Whitehouse, W. E. ..................................... 184, 593
Wicks, W. H. ........................................... 273, 599
Wickson, E. J. .......................................... 803
Wildcr, H. J. ............................................ 600
Wilkinson, A. E. ....................................... 601
Williams, William ....................................... 323
Williamson, C. H. ...................................... 602
Wilson, C. S. ............................................ 351, 603
Wilson, L. W. ............................................ 565
Wine .................................................... 562
Winkler, A. J. .......................................... 376, 604
Winslow, R. M. ......................................... 804
Wisconsin. Agricultural experiment station .............. 194, 677
Wisconsin. Dept. of agriculture ....................... 605
Wisconsin. Dept. of markets .......................... 250
Wisconsin state horticultural society .................. 26, 32, 159, 406, 805-806
Woff, W. H. ............................................ 347, 607-608
Wood, J. C. ............................................. 609
Woodbury, C. G. ....................................... 610-611
Woodward, J. S. ....................................... 612
Woodworth, H. C. ..................................... 613
Woolsey, C. .............................................. 807
Work, Paul .............................................. 614
Wright, R. C. ............................................ 147
Wyoming. Board of horticulture ....................... 695, 808
Yoeman, C. V. ......................................... 532
Young, W. J. ............................................ 615
Young men's Christian association ...................... 616
Youngers, Peter, jr. ................................... 617
Yount, H. W. ............................................ 313, 618
AGRICULTURAL ECONOMICS BIBLIOGRAPHIES

No. 1. Agricultural economics; a selected list of references. Compiled by Mary G. Lacy, Librarian, Bureau of Agricultural Economics. January, 1925.


No. 3. A beginning of a bibliography of the literature of rural life. Compiled by Mary G. Lacy, Librarian, Bureau of Agricultural Economics. March, 1925.

No. 4. Price spreads; a selected list of references relating to analyses of the portion of the consumer's price accruing to various agencies. Compiled by Louise O. Bercaw, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. March, 1925.

No. 5. Long-time agricultural programs in the United States - national, regional, and state. Compiled by Mary G. Lacy, Librarian, Bureau of Agricultural Economics. June, 1925.

No. 6. Aids to writers and editors; a selected list of books on the preparation of manuscripts and the mechanics of writing for use in the Bureau of Agricultural Economics. Compiled by Emily L. Day, under the supervision of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. June, 1925.

No. 7. Livestock financing; a selected list of references relating to the financing of the livestock industry in the United States. Compiled by Katharine Jacobs, Library, Bureau of Agricultural Economics, under the direction of Mary G. Lacy, Librarian, September, 1925.

No. 8. The peach industry in the United States; a selected list of references on the economic aspects of the industry including some references relating to Canada. Compiled by Louise O. Bercaw, Library, Bureau of Agricultural Economics, under the direction of Mary G. Lacy, Librarian. October, 1925.

No. 9. Selected list of references on grain sorghums, grass sorghums, and broom corn. Compiled by C. Louise Phillips, Scientific Assistant, Grain Investigations, in cooperation with the Library, Bureau of Agricultural Economics. December, 1925.

No. 10. Research in rural economics and rural sociology in the southern states since 1920; a list of the published, unpublished, and current studies. Compiled in the Library, Bureau of Agricultural Economics.
Economics, under the direction of Mary G. Lacy, Librarian. January, 1926.

No. 11. Economic periodicals of foreign countries published in the English language; a selected list. Compiled by Louise O. Bercaw, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. February, 1926.


No. 13. Cooperative marketing of tobacco; a selected list of references. Compiled by Katharine F. Williams, Division of Agricultural Cooperation, in cooperation with the Bureau Library. February, 1926.

No. 14. Factors affecting prices; a selected bibliography, including some references on the theory and practice of price analysis. Compiled by Louise O. Bercaw, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. March, 1926.

No. 15. Alabama; an index to the state official sources of agricultural statistics. Compiled by Margaret T. Olcott, Assistant Librarian, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. March, 1926.

No. 16. Periodicals relating to dairying received in the U. S. Department of Agriculture. Compiled by Muriel F. Wright, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. June, 1926.

No. 17. Farm youth; a selected list of references to literature issued since January, 1920. Compiled by Margaret T. Olcott and Louise O. Bercaw, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. October, 1926.

No. 18. Price fixing by governments 424 B.C. - 1926 A.D.; a selected bibliography, including some references on the principles of price fixing, and on price fixing by private organizations. Compiled by Mary G. Lacy, Annie M. Henney and Emily L. Day, Library, Bureau of Agricultural Economics. October, 1926.

No. 19. The apple industry in the United States; a selected list of references on the economic aspects of the industry together with some references on varieties. Compiled by Louise O. Bercaw, under the direction of Mary G. Lacy, Librarian, Bureau of Agricultural Economics. June, 1927.