An Agricultural Program for Oregon

By Paul V. Maris
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INTRODUCTION

This bulletin contains an analysis of facts for the purpose of determining:

1. What crop, livestock, and fruit products can most profitably be grown and marketed in the state of Oregon.

2. How the production of these commodities can best be distributed and organized to harmonize with natural conditions and facilitate marketing.

In brief, we are endeavoring to present Oregon agriculture as it is, analyze the factors that have a bearing upon its further development, and suggest the general outlines of a program for the guidance of all agencies concerned with agricultural improvement.

Much is known and recorded about how to produce crops, but it is apparent that we must likewise give consideration to the question of what crops we are to produce. Particularly is this true in a state as yet undeveloped, far removed from great consuming centers, and with a wide range of choice as to possible lines of production. Opportunities for diversification add to the complexity of our problem of developing a well-balanced agriculture.

In the preparation of this material we are proceeding without guide or precedent, fully conscious of the possibilities of errors and the necessity of subsequent modification or amendment. We offer the study as a beginning, however, believing that it will be of value in helping to shape the course of future agricultural development.

The information upon which the bulletin is based is the outgrowth of numerous conferences with the various specialists of the Experiment Station and the Extension Service of the Oregon Agricultural College. The author has merely assembled and organized the material with a view to contributing to what is conceived to be a present need in the state. Grateful acknowledgement is due the Office of Extension Work of the United States Department of Agriculture for the services of Mr. E. Merritt, who has contributed helpful advice and made available much valuable data, some of which have not been previously published. Much of the tabular material set forth in graphs, tables, and maps has been assembled and classified by R. S. Besse, Specialist in Organization and Marketing, Oregon Agricultural College. The suggestions for a program of procedure in developing better marketing facilities for our important specialties were formulated in consultation with C. J. Hurd, Specialist in Organization and Marketing for the Oregon Agricultural College Extension Service.
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RESUME OF IMPORTANT FACTS

1. Oregon agriculture had its beginning approximately one hundred years ago.

2. In 1919 the state had a population of 783,000; there were in round numbers fifty thousand farms and five million acres of improved farm land, and all farm property was valued at eight hundred and eighteen million dollars.

3. In maintaining a favorable trade balance Oregon is dependent primarily upon timber and agricultural resources.

4. In comparison with its opportunities and natural resources the state has lagged behind in agricultural development and growth of population.

5. Up to the present time there has been no comprehensive attempt to direct the development of our agriculture with a view to coordinating important factors and maintaining a proper balance between production and marketing.

6. The present need is for a comprehensive program, based upon a thorough analysis of both production and marketing possibilities, to serve as a guide to all agencies in the further development of our agriculture.

7. If the decline of Oregon agriculture is to be avoided, it is necessary to bring about conditions that will enable the average farmer to secure returns from his investment and labor commensurate with those obtained in other industries; this, therefore, should constitute the first objective of a vital program.

8. Eighty percent of the Nation's food nutrients comes from wheat, dairy products, beef, pork, sugar, and corn. With the exception of sugar the Middle West and far West are producing most of these commodities in excess of consumption. The Northeast or Atlantic seaboard, is the greatest consuming or importing region for these products.

9. Oregon produces a moderate surplus of the staple commodities for which there is a relatively unlimited established market, and a very large surplus of certain specialties which form the minor source of the Nation's food supply and for which it is necessary to develop consumption demand.

10. The development of markets for our specialties constitutes our most pressing agricultural problem. Our need is for
large powerful agencies which have a comprehensive knowledge of world market conditions, which can compile and interpret information as to supply and demand, and which have adequate facilities and equipment for financing, storing, grading, and advertising our products. Such agencies should be cooperative associations, owned and controlled by the producer.

11. Cooperative marketing should be adopted as the system by means of which we can most advantageously grade and standardize our products, create brands, develop markets, and stabilize prices to growers. Such associations affect the general price level favorably. They are not always able materially to shorten the route from producer to consumer, however, and non-members often profit as greatly as members.

12. In the development of new cooperative associations first consideration should be given to commodities classed as specialties, for which markets must be developed.

13. Since the lower grades of fruits and vegetables are usually consumed near the point of production Oregon growers, far from large markets, should pay particular attention to the factor of quality.

14. While we should develop our specialties to the greatest extent possible, staples will continue to constitute the major source of our agricultural income.

15. The dairy industry should be made the basis around which we develop our diversified farming system. Poultry, swine, farm flocks of sheep, legume seeds, breeding stock, fruits and vegetables, constitute important secondary features of a diversified program.

16. To encourage the best practices of production and facilitate marketing, we should concentrate production by communities. This can be done without interfering with necessary diversification.
SYNOPSIS OF AGRICULTURAL PROGRAM FOR OREGON

(Note: For information on cultural practices, varieties, disease control, etc., secure publications of Oregon Experiment Station and O. A. C. Extension Service. Lists of available publications supplied upon application. Address requests to Oregon Agricultural College.)

I. Wheat.

1. Most important single crop in the state.

2. No reduction of acreage in dry farming area of Eastern Oregon where satisfactory yields are obtained.

3. About a ten percent reduction in wheat acreage in remainder of state. Land thus released to be devoted to production of forage crops for dairy cattle.

4. Cut number of varieties grown in the state from 60 down to 12. For best varieties see Oregon Agricultural College Experiment Station publications.

5. Cooperate with Extension Service in wheat certification program.

6. Build up and strengthen cooperative selling organization.

II. Beef Cattle.

1. Range lands where grazing and feed conditions are best suited to beef production should continue to be utilized for that purpose. Alternating from cattle to sheep and sheep to cattle under influence of temporary price fluctuations not justified on such lands. Carrying capacity of ranges should be increased by deferred and rotation grazing. (See Extension Bulletin 366.)

2. In the long run, under equally favorable conditions and equally good management, the sheep industry has some financial advantages over the cattle business, but selling cattle at bottom prices and purchasing sheep at top prices is inadvisable.

3. Carrying capacity of ranges should be increased by deferred and rotation grazing (see Extension Bulletin 366).

4. Ship to Portland and Coast markets cattle fat enough for immediate slaughter weighing from 1000 to 1100 pounds.

5. Adjust shipments of fat stock to trade demands.

6. Develop feeder cattle exchange in various counties and avoid expense of shipping to and from Portland.

7. Develop cooperative shipping of livestock owned in less than car lots. Encourage direct shipment by owners of full carloads.
8. Study cost of production with a view to putting industry on a more sound and permanent financial basis.

III. Wool and Mohair.

1. Range lands where grazing and feed conditions are best adapted to sheep should continue to be utilized for that purpose. Improve carrying capacity of ranges by rotation and deferred grazing.

2. Maintain or increase farm flocks in diversified farm section.

3. Build up and strengthen cooperative wool selling organization. Develop selling of wool by grades in place of indiscriminate bulk sales.

4. Increase weight and quality of fleece by culling out inferior ewes and breeding to well-fleeced rams.

5. Continue shearing, docking, and castrating demonstrations in small flock territory until better practices are generally adopted.

6. Develop cooperative shipments of sheep owned in less than car lots and direct shipments by larger shippers.

7. Conduct cost of production studies with a view to putting the industry on a more sound and permanent financial basis.

8. Increase production of mohair on logged off areas.

IV. Dairying.

1. Develop dairying as major enterprise in diversified farming program.

2. Deliver better quality of milk and cream to factories as first essential step toward producing quality product that will sell to advantage in outside markets. Pay for cream on quality basis and provide official inspection to insure observance of grades.

3. Build up system of local cooperative associations with central selling agency.

4. Continue herd improvement work.

5. Continue bovine tuberculosis eradication under circumscribed area plan.

6. Increase size of herds in diversified farming area from six or eight cows up to twelve or fourteen cows, thus decreasing labor costs.

7. Develop cropping system around dairy industry and improve permanent pastures.

8. Capitalize on superior breeding stock by working out national selling plan.
9. Appropriate funds for conducting investigations in control of contagious abortion under auspices of the Oregon Experiment Station.

V. Poultry.

1. Develop as important secondary enterprise in diversified farming program.

2. On general farm maintain small flock for home use only, or large unit of about 400 hens likely to receive the care and attention essential to success.

3. Sell eggs through central cooperative selling agency.

4. Secure state appropriation for carrying on investigations in poultry disease control under auspices of Oregon Experiment Station.

5. Continue poultry demonstration flock system under auspices of Extension Service.

6. Work toward some system of certified breeding stock and accredited hatcheries.

VI. Loganberries.

1. Preserve the industry.

2. Growers organize. Sell through central sales agency. Authorize sales tax to create fund for advertising, demonstrating product, and developing new or better methods of preparation for market.

3. Create fund or secure appropriation to investigate cause of high prices charged eastern consumers and take necessary steps to hold consumer's price down to point that will encourage consumption.

VII. Other Small Fruits.

1. Raspberry, blackberry plantings should be gradually increased as markets are developed.

2. Develop system of grower-owned and grower-controlled cooperative canneries for handling all canned products. Develop brands backed by quality and work toward reduction of prices to consumers.

VIII. Prunes.

1. A Pacific Coast monopoly. Growers should organize, sell through central cooperative agency, and take steps necessary to increase consumption sufficiently to take care of rapidly increasing output. Increasing consumption involves: (1) a standardized high
quality product; (2) reasonable prices to consumers; (3) other and better ways of preparing prunes for sale; (4) advertising and demonstration. By following this program present consumption of one and one-half pounds of dried prunes per capita can be increased sufficiently to solve problem. Unless such steps are taken prune growers face expensive, unnecessary and inadvisable alternative of pulling out orchards. Further planting should be suspended until program for increasing consumption is under way.

IX. Apples.

1. Export demand is for high quality only.
2. Eliminate non-commercially handled and low yielding orchards reducing them to family or home-town consumption size. This will decrease Oregon's output 25 percent and simplify marketing problem.
3. Maintain well-managed commercial orchards, but further increase in acreage of this class of planting not now advisable.
4. Coordinate selling program of Northwest marketing organizations.

X. Cherries.

1. Another virtual Pacific Coast monopoly. Market for canned sweet cherries is growing and market for fresh fruit susceptible of great increase if price can be reduced to consumers.
2. Increase production by: (1) grafting in pollenizers where needed; (2) building up soil fertility; (3) controlling cherry maggot; (4) gradually increasing acreage on well-adapted soils.

XI. Pears.

1. Good market for fancy pears, particularly of later varieties. Gradual increase justified in communities where production practices are on high plane and marketing connections are established.

XII. Peaches and Apricots.

1. Oregon lies north of main peach belt. Production for export not justified except as canneries may call for peaches and apricots in certain localities adapted to production.

XIII. Walnuts and Filberts.

1. Another virtual Pacific Coast monopoly. Under-production of both walnuts and filberts in United States. Gradual increase of acreage in Oregon justified. Should grow to large industry within next ten years.
2. Sell product through grower-owned and grower-controlled cooperative association, independently or in cooperation with California organization.

3. Before putting money in orchard, secure competent advice relative to location, soil, varieties, and methods of handling.

XIV. Potatoes.


2. Develop adequate supply of disease-free seed stock for home use by certification or otherwise.

3. Growers should organize, control quality, and build up seed trade.

XV. Broccoli.

1. Attempt to develop broccoli industry only after growing tests extending over two or three years.

2. Engage in industry only on community scale extensive enough for car-lot shipment.

XVI. Pork.

1. Develop as important secondary enterprise in diversified farming region.

2. Limit production approximately to state's requirement.

3. Develop cooperative shipping.

4. See pork production program on pages 91-93.

XVII. Breeding Stock.

1. Capitalize on high-producing strains by developing out-of-state market.

XVIII. Barley.

1. Grow more extensively in hot, dry districts of Columbia Basin and use as substitute crop for much of the oats now grown in Western Oregon.

XIX. Corn.

1. Can be successfully produced for grain in warm valleys of Snake, Columbia, Rogue, and Umpqua rivers and on warm soils of Willamette Valley.
2. Increase corn acreage by twenty to thirty-five thousand acres and eliminate eastern importation.

XX. Legume and Grass Seed.

1. Increase acreage devoted to production of clover seed in Willamette Valley and irrigated districts remote from railroads.

2. Develop production of Grimm alfalfa seed in Eastern and Southern Oregon.

3. An industry amounting to a million dollars a year can be developed in Western Oregon from sale of such seeds as rye grass, orchard grass, tall oat grass, redtop, and creeping bent grass.
An Agricultural Program for Oregon

By

PAUL V. MARIS

PART I

THE BEGINNING OF OREGON AGRICULTURE

"By 1828 a fine farm had opened on the prairie about the Fort, and fields of wheat, oats, corn, peas, and barley flourished in the rich soil of this favored locality. . . . The Vancouver pasture fed about 200 cattle, 14 goats, and 50 horses, while ranging in the surrounding woodland were about 300 swine."

The above quotation from Shafer's History of the Pacific Northwest, recounts the beginning of agriculture in what was then known as the Oregon Country. After a lapse of practically one hundred years it is fitting that we take some measure of our progress, analyze our present situation and seek to find some facts to guide us in our onward march.

The farm above referred to is that which lay around Fort Vancouver, where Dr. McLaughlin maintained the headquarters of the Hudson Bay Company. A few of this company's trappers and hunters, after tiring of the strenuous and hazardous pursuits of their occupation, settled down to till the land, becoming the first farmers of Oregon. They were followed shortly by missionaries who, in addition to their religious labor, likewise engaged in farming. For example, we read that "in the spring of 1837 Whitman planted twelve acres of corn and one acre of potatoes, besides peas and barley. A few cattle were early procured from the East, and these, multiplying rapidly and being added to from time to time, soon developed into considerable herds."

In 1836 President Andrew Jackson sent an agent to the Pacific Coast in the person of W. A. Slacum. He pronounced the Willamette Valley the finest grazing country in the world and "believed that if the settlers could be better provided with cattle which were as yet comparatively scarce, the prosperity of the country would be assured." As a result of his activities an association was formed and "Ewing Young, P. L. Edwards, with a few others, took passage in the Loriot, to California, where they bought 800 head of cattle at $3.00 apiece, and 40 horses at $12.00. After many vexations and hardships they arrived in the Willamette Valley.
with 600 head of stock, the remainder having been lost on the way."

"The bringing of these cattle in the fall of 1837 marked the opening of a new era for Oregon. It gave a great stimulus to stock raising, for which the country was especially adapted, promoted the prosperity of settlers already there, and by the reports which soon traveled eastward, caused many people of the Mississippi Valley to look with longing eyes toward this land of peace and plenty, thus preparing the way for the colonizing movement which was about to begin."

Fig. 1. Fat cattle in the range country. The cheapest beef is produced on grass, and range lands best suited for cattle grazing should be used for this purpose.

Professor J. B. Horner, in his History of Oregon, makes the following statement relative to the first Oregon nursery:

"The first fruit nursery of Oregon was known as the Traveling Nursery because it was brought to Oregon on wheels. Henderson Luelling, a prosperous nurseryman of Henry County, Iowa, conceived the idea of conveying trees by wagon to Oregon. Thereupon in the early spring of 1847, with his son Alfred he started westward, driving two four-yoke of ox teams hauling about 800 vigorous young trees. They arrived at the present site of Milwaukie, November 27th. Their trees consisted of different varieties of apple, pear, peach, plum, and cherry, and were in immediate demand; hence the nursery was permanently established in that locality, and gave to Oregon the name of the 'Land of the Big Red
Apple.' In 1851 a good crop of apples and cherries was harvested from these trees and four bushels of apples were sold in San Francisco for $500.”

It is not within the scope of this publication to write a history of Oregon agriculture, but in briefly sketching events of outstanding importance mention should be made of the fact that there followed in the pathway of the trappers and missionaries who first took up the tilling of the land and the care of herds and flocks, a generation of pioneer settlers who crossed the continent, coming mostly from the agricultural regions of the Mississippi Valley, to establish homes and develop farms in Oregon. It is interesting to learn something of the motives which prompted these pioneers to make their perilous journey. It appears that fertile soils and good markets were among the allurements, for we read in connection with the descriptions of the country which grew out of the discussion in Congress over the settlement with Great Britain as to the title to the Oregon Country, that the Willamette Valley was a favored land for the farmer and stockman, possessing rich soil, mild climate, and such a combination of prairie and forest, with springs of pure water everywhere, as would make the opening of new farms peculiarly easy and pleasant. In the Western states the settlers had suffered much for the lack of easy transportation, their crops bringing scarcely enough for the labor expended upon them, but in Oregon they would have a navigable river at their door and the ocean but a short distance away. The market for grain was said to be good, cattle were reported to be worth four times what they were bringing in Western Missouri, and in each case the cost of production was much less. Oregon also had other resources aside from these exceptional agricultural advantages. Her streams were full of the finest salmon, which might be packed and shipped at a good profit. Splendid forests of fir and pine extending to the water’s edge invited the establishment of lumber mills, and unlimited water power was at hand for all manufacturing purposes. Such a combination of elements the pioneers thought would insure the development of a prosperous state on the shores of the Pacific.”*

Such was the purport of what was written and said about a hundred years ago, when the first comers were extolling the wonders of the Oregon Country and appealing to their friends back home to join them and help claim this land of promise as a part of the rapidly growing American Republic.

In our discussion of Oregon agriculture and its present status, we will let facts and statistics tell the story of how the dreams and

*Quotations in Part I, except as otherwise noted, are taken from “History of the Pacific Northwest” by Joseph Shafer, copyrighted by The Macmillan Company. Reprinted by permission.
prophesies of the pioneers came true, all presented for the ultimate purpose, however, of arriving at a better understanding of how to meet the exigencies of the present and those that yet lie in the future.

PART II

THE GROWTH OF OREGON AGRICULTURE

The following table based upon the United States Census shows the increase in population, number of farms, acres of improved land, and value of all farm property in the State of Oregon, from the years 1850 to 1920 inclusive.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total population</th>
<th>Number of farms</th>
<th>Acres improved land</th>
<th>Value all farm property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>13,294</td>
<td>1,164</td>
<td>132,857</td>
<td>$4,908,782</td>
</tr>
<tr>
<td>1860</td>
<td>52,465</td>
<td>5,806</td>
<td>896,414</td>
<td>22,099,161</td>
</tr>
<tr>
<td>1870</td>
<td>90,923</td>
<td>7,587</td>
<td>1,116,290</td>
<td>30,475,381</td>
</tr>
<tr>
<td>1880</td>
<td>174,768</td>
<td>16,217</td>
<td>2,198,645</td>
<td>76,975,140</td>
</tr>
<tr>
<td>1890</td>
<td>317,704</td>
<td>25,530</td>
<td>3,516,000</td>
<td>143,024,800</td>
</tr>
<tr>
<td>1900</td>
<td>413,536</td>
<td>35,837</td>
<td>3,328,308</td>
<td>172,761,287</td>
</tr>
<tr>
<td>1910</td>
<td>672,765</td>
<td>45,502</td>
<td>4,274,803</td>
<td>528,243,782</td>
</tr>
<tr>
<td>1920</td>
<td>783,389</td>
<td>50,206</td>
<td>4,913,851</td>
<td>818,559,751</td>
</tr>
</tbody>
</table>

During the thirty years between 1860 and 1890 it will be noted that the population lacked only a little of doubling each ten years. From 1900 to 1920, however, the rate of increase was so retarded that during this period of twenty years the population has not doubled, while less than 15,000 farms and only a million and a half acres of improved land have been added. Oregon ranked eighteenth among the states in increase of population from 1910 to 1920. While it would appear that the great natural resources of the state in the form of timber, water power, and undeveloped agricultural land, would have resulted in a greater growth than that recorded in the census, nevertheless the increase from 13,000 to 783,000 in population and from five million to eight hundred and eighteen million dollars worth of farm property represents the development of a single life span of seventy years, and suggests to the imagination something of the further change that may take place during the lifetime of many of our citizens.

PART III

PRESENT STATUS OF OREGON AGRICULTURE

Considered from the standpoint of its ultimate possibilities Oregon agriculture is still undeveloped. The state has a total land area of 95,607 square miles, or 61,188,480 acres. This is greater than the combined area of all the New England States. Of this
total area 13,542,318 acres, or 22.1 percent are included in farms and 4,913,851 acres, or 8.2 percent are classed in the United States Census as improved land (defined as all land regularly tilled or mowed, land in pasture which has been cleared or tilled, land lying fallow, land in gardens, orchards, vineyards, and nurseries, and land occupied by farm buildings). This relation of improved land to total land area is graphically shown by the accompanying map.

An accurate picture of Oregon's agriculture is not represented, however, by the small circle upon the state map, for the reason that it excludes from consideration the vast areas of grazing land which provide the major part of the feed supply for our cattle and sheep from which we receive more than one quarter of our agricultural income. The accompanying map showing the grazing lands and improved farm lands was prepared by Professor E. L. Potter of the Animal Husbandry department of the Oregon Agricultural College. The entire state area devoted to some phase of agricultural production is indicated. The unshaded portion consists mostly of lands so densely timbered and covered with underbrush as to be valueless for grazing purposes. (Fig. 3.)

**SOURCES OF FARMERS' INCOME**

The following table presents an estimate of the total income received from all agricultural products for the year 1919 and re-
ported in the 1920 census. In order to avoid duplication the value of the crops fed to livestock and the value of the seed used for planting purposes have been deducted from the total value of farm crops and cereals. It should be noted also that the figures are based upon prices prevailing in 1919 and that fluctuations in the relative prices of commodities would change the percentage figures.

Under normal conditions the percent of the income derived from the sale of dairy products would probably be increased and the percent of the income from cereals would be slightly decreased.

<table>
<thead>
<tr>
<th>Product</th>
<th>Income</th>
<th>Percent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>$40,648,000</td>
<td>31.3</td>
</tr>
<tr>
<td>Livestock and meats</td>
<td>29,793,000</td>
<td>22.9</td>
</tr>
<tr>
<td>Dairy products</td>
<td>15,917,000</td>
<td>12.3</td>
</tr>
<tr>
<td>Fruits and nuts</td>
<td>15,360,000</td>
<td>11.8</td>
</tr>
<tr>
<td>Hay and forage</td>
<td>8,721,000</td>
<td>6.7</td>
</tr>
<tr>
<td>Wool and mohair</td>
<td>6,810,000</td>
<td>5.2</td>
</tr>
<tr>
<td>Vegetables (including potatoes)</td>
<td>5,100,000</td>
<td>3.9</td>
</tr>
<tr>
<td>Poultry products</td>
<td>4,474,000</td>
<td>3.4</td>
</tr>
<tr>
<td>Other crops</td>
<td>3,032,000</td>
<td>2.3</td>
</tr>
</tbody>
</table>

$129,855,000  100
INCOME FROM AGRICULTURAL PRODUCTS IN OREGON 1919 (U.S. CENSUS)

Cereals
$40,648,000
31.3%

Fruits & Nuts
$15,360,000
11.8%

Hay & Forage
$8,721,000
6.7%

Live Stock & Meats
$29,793,000
22.9%

Other Crops
$3,032,000
2.3%

Vegetables & Potatoes
$5,100,000
3.9%

Wool & Mohair
$6,310,000
5.2%

Poultry Products
$4,774,000
3.4%

Dairy Products
$15,917,000
12.3%

Fig. 4
TOTAL VALUE OF ALL CROPS AND LIVESTOCK

The total value of all crops produced and all livestock owned, considered apart from the income from sales during any given year is indicated by the following table (1920 Census):

<table>
<thead>
<tr>
<th>Value of all Crops</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>53,980,000</td>
</tr>
<tr>
<td>Hay and forage</td>
<td>41,835,000</td>
</tr>
<tr>
<td>Fruits and nuts</td>
<td>20,373,000</td>
</tr>
<tr>
<td>Vegetables (including potatoes)</td>
<td>11,762,000</td>
</tr>
<tr>
<td>All other crops</td>
<td>2,565,000</td>
</tr>
<tr>
<td>Other grains and seeds</td>
<td>1,366,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$131,881,000</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value of all Livestock</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef cattle</td>
<td>29,427,000</td>
</tr>
<tr>
<td>Sheep</td>
<td>24,423,000</td>
</tr>
<tr>
<td>Horses</td>
<td>19,225,000</td>
</tr>
<tr>
<td>Dairy cattle</td>
<td>18,390,000</td>
</tr>
<tr>
<td>Swine</td>
<td>4,664,000</td>
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<tr>
<td>Poultry</td>
<td>3,058,000</td>
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<tr>
<td>Mules</td>
<td>1,589,000</td>
</tr>
<tr>
<td>Goats</td>
<td>585,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$101,361,000</strong></td>
</tr>
</tbody>
</table>

TYPES OF AGRICULTURE BY COUNTIES

The chart (Fig. 7) entitled “Income from Agricultural Products in Oregon, 1919” presents a study of the agriculture of the state by counties. For purposes of comparison counties are grouped by regions. The Blue Mountain counties of Baker, Union, and Wallowa, are grouped with the central and southeastern counties consisting of Grant, Wheeler, Deschutes, Crook, Harney, Klamath, Lake, and Malheur. Because of the similarity in type of farming, Jefferson county, ordinarily classed as a Central Oregon county, is included with the Columbia Basin group of Umatilla, Morrow, Gilliam, Sherman, and Wasco. Clatsop, Tillamook, Lincoln, Coos, and Curry constitute the Pacific Coast group; Douglas, Josephine, and Jackson, the Southern Oregon group; Columbia, Multnomah, Washington, Clackamas, Yamhill, Polk, Marion, Linn, Benton, and Lane, the Willamette Valley group; Hood River, differing in character and climate from both the Columbia Basin group and Willamette Valley group, is set off alone.

The state heads the list, making it possible to compare any county or group of counties with the composite average of the whole.

The left-hand column shows the percent of the total area of the state classed in the United States census report as “Improved Farm
TOTAL VALUE - ALL CROPS
$131,884,000
Based on 1920 U.S. Census.

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Value</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Cereals</td>
<td>53,980,000</td>
<td>41%</td>
</tr>
<tr>
<td>Fruits &amp; Nuts</td>
<td>20,373,000</td>
<td>15%</td>
</tr>
<tr>
<td>Vegetables</td>
<td>11,762,000</td>
<td>9%</td>
</tr>
<tr>
<td>Other Grains &amp; Seeds</td>
<td>1,366,000</td>
<td>1%</td>
</tr>
<tr>
<td>All other Crops</td>
<td>2,565,000</td>
<td>2%</td>
</tr>
<tr>
<td>Hay &amp; Forage</td>
<td>41,835,000</td>
<td>32%</td>
</tr>
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</table>

For the state the percentage factor is 8.2. The Columbia Basin group averages 27.5 percent of the total area in improved farm land or more than three times the state average, while the Willamette Valley group averages 19.47, or more than twice the state average. The Pacific Coast counties have only 2.9 percent of
TOTAL VALUE OF LIVESTOCK
$101,779,000
based on 1920 U.S. Census

their area improved while the average for the Blue Mountain,
Central, and Southeastern groups is 5 percent, Southern Oregon
4 percent, and Hood River county 5.7 percent.

- The second column lists the total income from sales of all
farm commodities with deductions for feed and seed.
The remaining columns show the percent of the income from the sale of agricultural products derived from: (1) cereals*; (2) livestock and meats; (3) dairy products; (4) fruits and nuts; (5) hay and forage; (6) wool and mohair; (7) vegetables, including potatoes; (8) poultry products; and (9) all other crops.

The first group of counties, it will be noted, derive their agricultural income largely from the sale of livestock, wool, and hay and forage. Baker, Union, and Wallowa each show a considerable income from cereals, but on a comparative basis not more than many of the Willamette Valley counties, while far less of their total income comes from this source than is the case with the Columbia Basin group. Klamath, Lake, and Malheur counties likewise sell cereals, but the long bars are found under the three columns mentioned above. A marked change is taking place in the type of farming in Malheur county, and if figures could be presented for the current year greater diversity would be indicated. There has been a rapid increase in dairying and in the production of red clover, potatoes, and head lettuce.

The Columbia Basin counties are notably the wheat and barley growing counties of the state, although livestock and wool are important in all of them but Jefferson. In this group we find quite a high degree of specialization, more in fact than the chart indicates for the reason that wheat land is quite exclusively devoted to that crop while the livestock is produced in other regions outside the wheat belt. Wasco county’s fruit and vegetable industries are of sufficient importance to justify special mention, and Umatilla county also has a highly developed fruit section in the Milton-Freewater region.

The Coast counties are the most highly specialized of the groups excepting Hood River, the income being derived largely from the sale of dairy products and dairy animals sold for beef, although some of the mountain ranges are devoted to animals of the beef breeds as well as to sheep and goats. The Coast counties have a growing small-fruit industry.

The Southern Oregon group of counties is quite diversified, showing fruit as the major source of income with almost an equal percentage coming respectively from the sale of cereals, livestock and meats, and dairy products, while the income from poultry products is of more importance than with any previously considered group.

The Willamette Valley counties also stand out as a group deriving its agricultural income from various sources. The income

*While cereals include all small grain, wheat is by far the most important in Oregon. Oats are important in Western Oregon.
## Income from Agricultural Products in Oregon

In 1910 from U.S. Census

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>% of Total Land Improved</th>
<th>Total Income from Sales</th>
<th>Cereals</th>
<th>Livestock and Meats</th>
<th>Dairy Products</th>
<th>Fruits and Nuts</th>
<th>Hay and Forage</th>
<th>Wool or Mohair</th>
<th>Vegetable and Fibodies</th>
<th>Poultry</th>
<th>Other Crops</th>
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<tbody>
<tr>
<td>OREGON</td>
<td>8.2</td>
<td>129,855,000</td>
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<tr>
<td>Baker</td>
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<tr>
<td>Union</td>
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<tr>
<td>Wallowa</td>
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<tr>
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<tr>
<td>Multnomah</td>
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<tr>
<td>Washington</td>
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</tr>
<tr>
<td>Yamhill</td>
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<td>566,500</td>
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<tr>
<td>Polk</td>
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<tr>
<td>Marion</td>
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<tr>
<td>Linn</td>
<td>18.0</td>
<td>6,462,000</td>
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</tr>
<tr>
<td>Benton</td>
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<td>2,910,000</td>
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</tr>
<tr>
<td>Lane</td>
<td>5.9</td>
<td>4,785,000</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Hood River</td>
<td>5.7</td>
<td>3,132,000</td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Percentage represented by combined length of line*
from cereals is the largest single factor, but this is due in part to
the effect of war conditions and prices prevailing when the census
figures were compiled. Livestock and meats, dairy products, fruit,
and nuts, are of about equal importance. The vegetable and potato
income is more important than with any other group, while poultry
products constitute an important minor item.

As is well known, Hood River is conspicuously a fruit county,
deriving 89.4 percent of its income from its tree and small fruits.

RELATION BETWEEN PRODUCTION AND CONSUMPTION OF
OREGON'S PRINCIPAL AGRICULTURAL PRODUCTS

Nothing gives a clearer insight into our marketing problem
than a study of the relation between the production and consump-
tion of our principal agricultural commodities. It is of interest
not only to know how much we have to sell of a given product
but also how many persons would be required to consume that
surplus, what other states or regions are likewise producing more
than can be consumed locally and where we may expect to find
our market.

With the single exception of pork, Oregon produces a surplus
of each of its important crops. Of wheat we produce enough for
our own population of 783,000 and a surplus sufficient to feed more
than 2½ million people. Interesting, indeed, is the fact that we pro-
duce prunes sufficient for our own use and a population of 38 mil-
lion people in addition, based upon the present rate of consumption
of this commodity. When we include the sister states of Washing-
ton to the north, and California to the south we find that these
three states can furnish prunes for their combined population of 5½
million people and in addition thereto 160 million people, or about
60 million more than the total population of the United States.
This does not take into account the non-bearing or newly planted
trees, which in the aggregate in the Pacific Coast states constitute
about fifty percent of the bearing trees.

In the face of these facts shown in the accompanying charts and
graphically illustrated by the horizontal bars, one of the para-
mount issues of our problem is brought into conspicuous relief.
Oregon growers must band themselves together to develop markets
for our surplus products. Particularly is this true of what we shall
refer to as our specialties, by which are meant particularly, those
fruits and vegetables grown here in great abundance and ex-
cellence and not adapted to the principal agricultural regions of the
country. Cooperative marketing has a larger service to render than
that of paying members higher returns than non-members. Upon
this type of organization would seem to devolve the responsibility of performing that function belonging rightly to the grower and unlikely to be performed for him by any other agency; namely, creating a demand for the products which he can best grow and in which his capital is invested. This service, if rendered, benefits all growers of a certain product, and should be financed by all growers. Definite recommendation covering this point will be presented in connection with the discussion of the different commodities.

In the following tables the quantity of the different products grown or produced in the state, the percentage relation which this production bears to the state's requirement, the quantity required for state consumption, the exportable surplus, and the number of persons required to consume this exportable surplus, are shown. Because of the direct bearing upon our marketing problem of the production of certain crops in Washington and California, a table is given for Oregon separately, and one for the three coast states collectively. It is of course true that the consumption of any product is relatively high where production is abundant, and low where the reverse is true. Since these variations can not be accurately appraised, nation-wide averages are used in these computations. By whatever amount our people may consume Oregon products above the per capita average of the nation, to that extent our exportable surplus would be reduced.

RELATION BETWEEN PRODUCTION AND CONSUMPTION
OF PRINCIPAL AGRICULTURAL PRODUCTS, OREGON

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity produced</th>
<th>Percent of state's requirement</th>
<th>Quantity required for state consumption</th>
<th>Exportable surplus</th>
<th>Number of persons required to consume exportable surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>20,600,000 bu.</td>
<td>440</td>
<td>4,380,000</td>
<td>14,870,000</td>
<td>2,657,000</td>
</tr>
<tr>
<td>Milk</td>
<td>798,467,000 lbs.</td>
<td>111</td>
<td>720,360,000</td>
<td>78,107,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Beef</td>
<td>88,000,000 lbs.</td>
<td>166</td>
<td>52,852,000</td>
<td>35,148,000</td>
<td>520,700</td>
</tr>
<tr>
<td>Pork</td>
<td>230,000 head</td>
<td>52</td>
<td>438,480</td>
<td>-208,480 head</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>14,625,000 doz.</td>
<td>125</td>
<td>11,745,000</td>
<td>2,880,000</td>
<td>192,000</td>
</tr>
<tr>
<td>Wool</td>
<td>16,000,000 lbs.</td>
<td>400</td>
<td>4,000,000</td>
<td>12,000,000</td>
<td>2,400,000</td>
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<tr>
<td>Potatoes</td>
<td>4,868,000 bu.</td>
<td>167</td>
<td>2,740,000</td>
<td>1,741,000</td>
<td>497,000</td>
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<tr>
<td>Apples</td>
<td>6,920,000 bu.</td>
<td>660</td>
<td>1,050,000</td>
<td>5,870,000</td>
<td>4,400,000</td>
</tr>
<tr>
<td>Pears</td>
<td>760,000 bu.</td>
<td>740</td>
<td>100,000</td>
<td>660,000</td>
<td>5,000,000</td>
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<tr>
<td>Small</td>
<td>18,978,000 qts.</td>
<td>800</td>
<td>2,350,000</td>
<td>16,628,000 qts.</td>
<td>5,500,000</td>
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<tr>
<td>Prunes</td>
<td>58,500,000 lbs.</td>
<td>500</td>
<td>1,175,000</td>
<td>57,323,000</td>
<td>38,200,000</td>
</tr>
</tbody>
</table>

*1,350,000 bushels of wheat and 387,000 bushels potatoes deducted for seed.
**Average produced 1920-1922.
RELATION BETWEEN PRODUCTION AND CONSUMPTION OF PRINCIPAL AGRICULTURAL PRODUCTS, PACIFIC COAST

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity produced</th>
<th>Percent of Pacific Coast requirement</th>
<th>Quantity required for Pacific Coast States' consumption</th>
<th>Exportable surplus</th>
<th>Number persons required to consume exportable surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Wheat</td>
<td>77,849,000 bu.</td>
<td>232</td>
<td>31,175,200</td>
<td>41,395,900</td>
<td>7,392,000</td>
</tr>
<tr>
<td>Milk</td>
<td>4,384,225,000 lbs.</td>
<td>87</td>
<td>5,060,000,000 lbs.</td>
<td>-5,060,000,000 lbs.</td>
<td>Deficit</td>
</tr>
<tr>
<td>Beef</td>
<td>331,077,110 lbs.</td>
<td>87</td>
<td>371,250,000</td>
<td>-40,173,000</td>
<td>Deficit</td>
</tr>
<tr>
<td>Pork</td>
<td>1,441,000 head</td>
<td>41</td>
<td>3,080,000</td>
<td>-1,639,000</td>
<td>Deficit</td>
</tr>
<tr>
<td>Eggs</td>
<td>100,000,000 doz.</td>
<td>120</td>
<td>83,500,000</td>
<td>17,500,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Wool</td>
<td>36,300,000 lbs.</td>
<td>130</td>
<td>27,800,000</td>
<td>8,500,000</td>
<td>1,700,000</td>
</tr>
<tr>
<td>**Potatoes</td>
<td>23,588,000 bu.</td>
<td>115</td>
<td>19,250,000</td>
<td>2,798,000</td>
<td>799,000</td>
</tr>
<tr>
<td>Apples</td>
<td>36,350,000 bu.</td>
<td>485</td>
<td>7,425,000</td>
<td>28,925,000</td>
<td>21,700,000</td>
</tr>
<tr>
<td>Pears</td>
<td>6,445,000 bu.</td>
<td>890</td>
<td>725,000</td>
<td>5,720,000</td>
<td>4,400,000</td>
</tr>
<tr>
<td>Small fruits</td>
<td>51,300,000 qts.</td>
<td>310</td>
<td>16,700,000</td>
<td>34,600,000</td>
<td>11,500,000</td>
</tr>
<tr>
<td>Prunes</td>
<td>250,000,000 lbs.</td>
<td>3100</td>
<td>8,350,000</td>
<td>241,650,000</td>
<td>160,000,000</td>
</tr>
</tbody>
</table>

*5,277,500 bu. of wheat and 1,539,400 bu. of potatoes deducted for seed.

**Average production 1920-1922.
BASIS OF COMPUTATIONS

Because of the importance of the relation of the facts presented in the foregoing tables to the conclusions herein set forth, and the probable interest in the basis of computation, the following illustrations are given. The average production of wheat in Oregon for the five years 1918 to 1922, inclusive, was 20,600,000 bushels, and the average number of acres devoted to the crop 1,080,200. After allowing a bushel and peck per acre for seeding purposes, we have 19,250,000 bushels for consumption. The per capita consumption is reported to be 5.6 bushels in the Year Book of the United States Department of Agriculture. By dividing the number of bushels available for consumption by the amount consumed by each individual, we ascertain the number of persons required to consume our wheat crop (3,440,000). Subtracting from this 783,000, the population of Oregon (1920 census, hundreds omitted) we have the figure presented in the fifth column of the chart (2,657,000).

According to the 1922 Year Book of the United States Department of Agriculture, the average consumption of all dairy products per capita per year on a milk equivalent basis is 920 pounds. The 1920 census shows that Oregon produced 798,487,000 pounds of milk in 1919. At the average per capita rate of consumption 720,360,000 pounds are required annually for the population of Oregon, leaving a surplus for export of 78,127,000 pounds, or enough for 85,000 persons.

In the case of several commodities no information was at hand relative to per capita rate of consumption. The method of determining this may be illustrated by selecting prunes as an example. The California Fruit News reports the 1922 crop at 250,000,000 pounds of dried product. Of this, one hundred million pounds were exported, and there were no imports. The export figure given by the California Fruit News checks with the exports statistics contained in the 1922 Year Book of the United States Department of Agriculture. The average exportation for the three years 1919, 1920, 1921, was 100,427,000 pounds. About one and a half million pounds, therefore, remained in the United States to be consumed by a population slightly in excess of one hundred million people. Thus the present per capita consumption of dried prunes appears to be about one and a half pounds.

On a similar basis of computation the per capita consumption of other commodities was found to be as follows: beef 67\frac{1}{2} pounds, pork 84 pounds, potatoes 3\frac{1}{2} bushels, eggs 15 dozen, apples 1 1/3 bushels, small fruits 3 quarts, pears .13 bushel. The quantity of wool used per capita in the manufacture of woolen goods is estimated at 5 pounds.
PART IV

THE FUTURE OF OREGON'S AGRICULTURE

A PROGRAM IS NEEDED

What of the future of Oregon agriculture? Should we attempt to understand and in a measure govern the influences that will operate to shape its destiny? Or should we assume that this is beyond our comprehension and within a realm where the element of human intelligence is to play no part?

One might harbor in his mind, also, a more or less unconscious impression that while the theme under discussion relates to public economy and has perhaps a general bearing upon our civilization in the enjoyment of which all may participate, yet it does not vitally affect the immediate well-being of those now on the land. But a careful study of the situation dispels all doubt as to the efficacy of directed effort in the field of agricultural development or its application to present prosperity.

The first essential to progress is a program. Without a program, organization becomes impotent and languishes. An agricultural program built upon the idea of creating conditions that will provide to the individual on the farm an opportunity to obtain returns from his labor and capital comparable to those secured in other lines of business will, if successful, be followed by general improvement. Such a program is our goal. The interest of the individual may be quickened by this assurance and by the knowledge that common understanding and concert of action are required to meet the complex problems now confronting us.

OBJECTS OF AGRICULTURAL DEVELOPMENT

Oregon, in order to maintain a favorable trade balance and avoid gradual impoverishment, must produce for sale goods equivalent in value to those purchased. Our automobiles, clothing, farm machinery, many of our prepared foods and household supplies, are manufactured outside the state, and we are largely dependent upon the wealth from the forests and farms to provide our purchasing power. Bulletin No. 2 published by the Oregon State Board of Forestry, contains the statement: "Everything considered, it appears safe to predict that privately owned timber in Oregon will be practically exhausted in twenty-five years, and considerable inroads will have been made in National Forest stumpage." While the state may, by the adoption of a constructive policy of reforestation, perpetuate the timber industry, it is apparent that it must eventually rely to a greater extent upon other sources of wealth.
It is universally recognized that agriculture is the basic national industry. With approximately one-third of our population residing on farms it is apparent that a curtailment of the purchasing power of this group affects business adversely. This is graphically shown by the following chart under the title "Periods of Business Depression Follow Times of Low Farmer Purchasing Power," which was recently distributed by the United States Department of Agriculture.

The principal objects of an agricultural program for the state are therefore to open opportunities for success to the individual farmer, contribute to a favorable trade balance, and stimulate business prosperity.

NO PANACEA CAN BE OFFERED

During the period of depression that has held agriculture in its grip since the post-war decline in prices, relief has been sought through improved credit facilities, lower interest rates, lower freight rates, tax reduction, cooperative marketing, and otherwise through legislative and economic adjustment. The solution of the problem will be hastened, however, by a realization of the fact that
it is a complex one, requiring the application of intelligence, industry, and cooperation in the selection of our agricultural enterprises and the growing and marketing of our products. Over reliance upon any particular measure of relief will result in ultimate disappointment. In the program that follows it will be noted that certain adjustments in production practices are prerequisites to successful marketing and that a new understanding of the purposes of cooperative marketing must prevail if dissatisfaction and probable failure are to be avoided.

FACTORS AFFECTING FUTURE AGRICULTURAL DEVELOPMENT

The two ultimately controlling factors in the proper balancing and development of our agriculture are:

1. What we can produce to advantage, and
2. What we can market to advantage.

There are other factors that will contribute to our growth, such as increasing the acreage of improved land by irrigation, drainage, and land clearing, intensifying the type of farming, and adopting the best methods of production.

Professor W. L. Powers, Chief in Soils of the Oregon Experiment Station, is authority for the statement that by drainage and irrigation the present area of improved land can be doubled and the reclaimed area will be above the average now farmed in its productive capacity. Professor H. D. Scudder, Chief in Farm Management, estimates that there are 830,000 acres of good agricultural land in stumps, aside from that now on farms.

Of the land reclaimable by drainage or susceptible of great increase in productive power by this process, one and a quarter million acres are in the Willamette Valley and its tributaries, one-half million in the Coast and lower Columbia counties, and approximately three-fourths of a million acres in the marsh land and irrigated regions of Central and Eastern Oregon. Of the like amount originally reclaimable by irrigation, one million is now under water, one million in feasible projects, and one-half million yet to be projected. Most of the irrigable land lies east of the Cascade Mountains, but it is estimated that a half million acres in the Willamette Valley may ultimately be irrigated.

While part of the irrigable land and part of that susceptible of drainage is now included in the five million acres of improved land in the state, it is also true that there is additional stump land on farms that may be cleared, so that from nine to ten million acres, or about twice our present area, may be regarded as the
approximate ultimate area of improved farm land in Oregon. Of course additional land not now regarded as suitable for farming may be utilized for this purpose when the population of the world is greatly increased. The estimates here presented deal with the approximate relation of land and population now obtaining.

Not only can the farming area be approximately doubled, but a more intensive type of farming can be practiced. For example, 31 percent of all the farms of the state are above 175 acres in size. While it is true that many large ranches are not adapted to intensive culture, we find that in the counties lying west of the Cascade Mountains, 22 percent of the farms are larger than 175 acres. Much of this land can, under a more intensive type of farming to which it is adapted, produce many times its present output. For example, according to the census of 1920, 110,000 acres were used in producing various types of fruits that returned the farmers $15,000,000 cash or $140 per acre. There were 820,000 acres in wheat, which brought the farmer $34,000,000 or $45 per acre, and 40,000 acres of potatoes from which the farmers sold $4,400,000, or $110 per acre. There were approximately 1,600,000 acres used to grow crops which were consumed by livestock. The total returns from the sale of livestock and livestock products were approximately $57,000,000, or the return per acre from livestock products was $35.00. As the land in the area adapted to intensive culture is devoted to kinds of farming yielding higher returns per acre, our production will be correspondingly increased.

It is not within the scope of this publication to consider practices of production except as they relate in a general way to our problem of marketing, but a summary of the possibilities of expansion and development would not be complete without reference to the increase in the volume of our agricultural production that may be obtained by better soil management, proper use of fertilizers, use of improved strains of seed, better cultural practices, disease and pest control, higher yielding cows and hens, better feeding methods, proper pruning, thinning, and spraying of orchards, etc. These are factors largely within the control of the individual and none but he who is ceaselessly diligent in their mastery is likely to prosper under any system or combination of circumstances that may obtain.

WHAT WE CAN PRODUCE TO ADVANTAGE

With the exception of sugar, pork, and corn, Oregon now produces abundantly all the staples that enter largely into the human diet. Our pork production can be increased at will, the freight
differential, as explained elsewhere, and not ability to produce, establishing our limitations in this connection. We have regions well adapted to sugar-beet production that might be devoted to this purpose if there appeared to be sufficient economic advantage in so doing. When we consider the fruits and vegetables, so essential to proper human nutrition, we produce, as shown graphically on pages 27-28, far in excess of our needs, ability to find markets placing the limit upon the acreage devoted to such crops rather than soil or climatic conditions.

The average wheat production of the United States is 13.8 bushels per acre, while the yield in Oregon is 19.3. The average production of milk per cow in Oregon is 4,205 pounds as against an average of 3,148 in the United States as a whole. Our yield exceeds that of Wisconsin by 20 percent and is only 5 percent under that of New York state. The following table shows other comparisons indicating the relatively high yields obtained here.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Average for Oregon</th>
<th>Average for United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>19.3</td>
<td>13.8</td>
</tr>
<tr>
<td>Oats</td>
<td>30.0</td>
<td>30.6</td>
</tr>
<tr>
<td>Potatoes</td>
<td>106 bu.</td>
<td>98.7 bu.</td>
</tr>
<tr>
<td>Milk per cow</td>
<td>4205 lbs.</td>
<td>3148 lbs.</td>
</tr>
<tr>
<td>Eggs per hen</td>
<td>70</td>
<td>55</td>
</tr>
<tr>
<td>Apples per bearing tree</td>
<td>2.1 bu.</td>
<td>1.2 bu.</td>
</tr>
<tr>
<td>Small fruit per acre</td>
<td>2250 qt.</td>
<td>1300 qt.</td>
</tr>
<tr>
<td>Hay</td>
<td>1.6 T.</td>
<td>1.25 T.</td>
</tr>
</tbody>
</table>

Oregon Jersey cows hold the world’s butter-fat production record in 6 out of 8 classes in the A and AA divisions, and 5 out of 8 in the AAA divisions. This state has produced 12 out of 30 of all the gold medal bulls of the breed, 22 out of 61 of the silver medal bulls, 2 out of 3 medal of merit bulls and 20 out of 55 medal of merit cows (information as of September 15, 1923).

The first 300-egg hen was produced at the Oregon Experiment Station. The effect of the combination of suitable climatic conditions and high-producing strains is indicated by the fact that the average production of the Oregon Experiment Station flock was increased from 96 eggs per hen per year in 1908-09, to 219 eggs per hen in 1917-18. Many of our commercial flocks at present maintain a 200-egg average, which is approximately 25 percent in excess of the commercial flock average of the farming regions where great extremes of temperature occur.

Reports have just been received on the cherry crop harvested this season (1923) in the Wasco county region. Mr. O. D. Doane
harvested 80 tons from his 20-acre orchard of fourteen-year-old trees, or an average of four tons an acre. Mr. E. H. Merrill harvested 22 tons from 4½ acres of twelve-year-old trees. These yields are fairly representative for the district, and the season has been favorable. Our well-managed prune orchards yield 1½ to 2 tons an acre on the dried prune basis, or three times that on the fresh fruit basis. Our red raspberries average from a ton to a ton and a half an acre and our blackcaps somewhat under a ton. Loganberries average from two to three tons an acre. In the case of all these small fruits far greater yields are not uncommon. Evergreen blackberry, the highest yielding commercial canning berry known, does exceptionally well in a limited area on the Pacific Coast, the largest portion of which is in Western Oregon. Yields of from six to eight tons are not uncommon. Pears of such varieties as the Bartlett, Bosc, Winter Nelis, Howell, etc., give excellent yields and superior quality in the fruit regions of Oregon. Yields of English walnuts compare favorably with those of other regions where they are grown commercially. Filberts, which give great promise in this region, are produced in but few sections.

From the above facts it will be noted that our possibilities in the field of production compare favorably with other good farm-

![Fig. 10. Harvest time in an Oregon pear orchard. We find the best practices of production and best marketing conditions in regions where industries are established on a rather large commercial scale. We should develop our agriculture in harmony with this principle.](image-url)
ing regions, and that our yields are enough greater in many instances to offset our higher freight costs in reaching markets.

**Natural and Economic Limitations Upon Production in Different Regions of Oregon**

While it is true that when we consider the state as a whole we can produce the principal articles of food entering into human diet in excess of our needs, nevertheless we find that rather definite limitations are placed upon agricultural production by conditions prevailing in certain regions of the state. Typography, precipitation, soil, temperature, and altitude are the important natural factors, while land values, transportation, distance from market, and availability of labor are determining economic factors.

Our problem of determining the crops that can be grown and marketed to advantage in Oregon will be greatly simplified by definitely setting aside those regions that are subject to a controlling extent to the restrictions enumerated. It happens that large areas fall within this classification. For example, the reader will recall the large portion of the state, shown by the map on page 17, which is devoted to grazing purposes. This comprises almost forty million out of sixty million of our acres, or two-thirds of the state's area. The major portion of this land will remain grazing land. It is subject to improvement by the observance of grazing practices that will permit of reseeding and give necessary protection to the nutritious grasses, but aside from recognizing the necessity of practicing the most efficient utilization of our vast cattle and sheep ranges, we may eliminate this question from further consideration except to note that our ranges are devoted to the production of beef, wool, and mutton, staple commodities with relatively unlimited established market. While Oregon produces beef in excess of the requirements of its present population, the three Pacific Coast states considered collectively are not producing sufficient beef for their own consumption.

Likewise, the wheat growing regions of the Columbia Basin counties will and doubtless should be used for wheat production under conditions likely to prevail for the next generation or two. Granting that the theory is correct, that the American farmer is suffering at present from conditions growing out of an overproduction of wheat, the decrease should come in regions where there are greater possibilities for diversification than are found in the dry farming sections of the Columbia Basin counties. For example, a glance at the chart showing sources of agricultural income in 1919, will indicate that the Willamette Valley counties derive a larger percent of their income from the sale of cereals than from
any other class of products. Certainly curtailment should come in cereal production in the Willamette Valley before this type of farming should be diminished in the dry-farming regions. In formulating a comprehensive program for the development of agriculture in the state, the possibilities of improving our wheat varieties, cultural practices, and marketing methods should not be disregarded. Under the question of what we can produce and market to advantage, however, the present dry-farming wheat lands may be assigned to their present use; namely, that of providing us, as in the case of our range lands, with a staple commodity of relatively unlimited established market.

The Pacific Coast counties, although vastly different in altitude, climate, and natural conditions from the region just considered, have an environment likely to result in rather permanently establishing the dairy industry in a place of outstanding importance. Here, however, root crops, kale, cabbage, broccoli, and small fruits thrive. Both poultry and pork may be produced advantageously along with milk and milk products. After giving dairying first place in these counties, therefore, there are still some unanswered questions as to what may be most advantageously produced and marketed, which will be considered in the following pages.

In this process of elimination we have dispensed in whole or in part with a large percent of the land in the state devoted to agricultural use, but we have not dispensed with the largest part of our improved farm land. Neither is the combined number of farmers using our ranges and farming our dry lands nearly as great as the number operating under conditions favorable to the production of a wide range of crops and livestock. In other words, after making due allowance for natural and economic conditions that limit agricultural production in different regions of the state, we still have before us the problem of organizing production with a view to efficient marketing in our great diversified farming sections.

It is also pertinent to this phase of our discussion to point out the fact that the land to be reclaimed by irrigation, drainage, or removal of timber and stumps, will not be devoted exclusively to grazing, or wheat growing, or dairying, but falls within the classification of our present diversified territory where it is necessary to determine what can be marketed most advantageously.

**WHAT WE CAN MARKET TO ADVANTAGE**

The extent and distribution of population, sources from which food elements are derived, and sections where the elements entering into the diet may be produced are all factors having a bearing
upon what we can market to advantage. In the following para-
graphs these factors will be considered briefly from the standpoint
of their relation to the problem of marketing the agricultural
products of this state.

THE INFLUENCE OF THE DISTRIBUTION OF POPULATION UPON
OUR MARKETING PROGRAM

The total population in the United States at present is approxi-
mately 110,000,000 and our rate of increase is about one percent,
or 1,000,000 persons each year. Thirty million of our people live
in New England, New York, Pennsylvania, and New Jersey, and
only 9,000,000 in the Mountain and Pacific Coast states of Colo-
rado, Wyoming, Montana, Utah, Nevada, New Mexico, Arizona,
Idaho, California, Oregon, and Washington. There are only about
a million fewer people in the small area along the North Atlantic
seaboard referred to above than in the whole area west of the
Mississippi River. The farmers of this densely populated area
across the continent do not completely supply the people of their
region with a single article of its food, while the Mountain and
Pacific Coast states produce an exportable surplus of most staple
foods and of wool.

The farmers of the New England and North Atlantic states
devote their land primarily to growing forage crops, which are fed
to dairy cows to supply market milk. They grow from 75 to 80
percent of their fresh vegetables, fruit, and potatoes, and from 35
to 50 percent of their poultry and eggs. The deficit in the above
items and the remaining food products are imported from the
states to the south and west.

Less than 10 percent of the beef, mutton, pork, and veal con-
sumed in New England is produced there. The Middle West has
enough of practically every major food product, and, in most in-
stances, a large surplus to export either to other parts of the
United States or to foreign countries.

The Southern states produce nearly enough corn for local
consumption, but wheat, oats, hay and forage, dairy and beef prod-
ucts they are compelled to import.

From this brief summary it appears that, where conditions per-
mit, perishable and bulky foods are produced near centers of popu-
lation and more concentrated staples are moved great distances.
While fruits and vegetables are likewise transported extensively,
this is a feasible practice only when the products are superior in
quality and capable of commanding a high price. The lower
grades are usually produced near the point of prospective con-
sumption.
Oregon’s situation with respect to potential markets for our agricultural products may therefore be summarized as follows: We are located in a relatively sparsely settled, surplus-producing region along the Western border of the continent. Of the foods which enter largely into our national diet, with the exception of sugar, a surplus is produced in the Middle Western farming region, while the people along the Atlantic Coast are dependent largely upon imports for these foods. From the standpoint of wheat, our principal exportable staple, the foreign markets are accessible at comparatively favorable rates by water transportation.

The situation differs with respect to fruits and vegetables, which constitute a minor but nevertheless essential part of the diet. Practically all sections of the United States, as well as other countries, may be regarded as potential consumers of our specialties, provided we master the problem of placing them upon the market in a form and at a price that will encourage extensive consumption.

Sources From Which We Derive Our Food

Protein, fats, carbohydrates, and minerals constitute important food elements as determined by chemical composition. Protein, fat, and carbohydrates all may furnish heat and energy, but they are supplied most cheaply and abundantly by the carbohydrates and fats. The amount of energy produced by any food is measured in calories. The following table shows that six food articles supplied over eighty percent of the calories used by the people of the nation during the six years 1911-12 to 1916-17.

<table>
<thead>
<tr>
<th>Food</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>25.9%</td>
</tr>
<tr>
<td>Dairy products</td>
<td>15.3%</td>
</tr>
<tr>
<td>Beef</td>
<td>5.3%</td>
</tr>
<tr>
<td>Pork</td>
<td>15.7%</td>
</tr>
<tr>
<td>Sugar</td>
<td>13.2%</td>
</tr>
<tr>
<td>Corn</td>
<td>7.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>82.4%</strong></td>
</tr>
</tbody>
</table>

The next table shows that these same six staples furnished eighty percent or more of the nation’s supply of protein, fat, and carbohydrates. Two articles of this group, wheat and dairy products, are also important sources of minerals and vitamins.

Fruits and vegetables are important in the diet because of their mineral and vitamin content, but their importance as sources of proteins, fats, and carbohydrates is much less than that of this group of six staple foods.
PERCENT OF PROTEIN, FAT, AND CARBOHYDRATES DERIVED FROM MAJOR STAPLES

The sources from which the food nutrients are derived determine the area devoted to the principal agricultural crops. For example, each year from fifty to sixty million acres of wheat are sown, while only two and a half million are devoted to apples, less than one million to such fruits as peaches, pears, and plums, and less than a quarter of a million to all small fruits combined. Hence it is apparent that any region may increase its acreage of wheat without having a very great effect upon the total wheat supply, while it takes but a limited increase in the acreage of small fruits or of such fruits as peaches, pears, and prunes, to have a marked effect upon the normal supply.

In 1919, 17.5 percent of the total improved land in the United States was devoted to the production of corn, 14.5 percent to wheat, and 16.2 percent to hay, while less than 1 percent was devoted to either potatoes or fruits, the exact percentage being .6 percent to potatoes, .5 percent to apples, .16 percent to peaches, .03 percent to pears, .04 percent to plums and prunes, and .05 percent to small fruits. For every acre of wheat, we have about 11 persons, but for every acre of small fruit we have 440 persons, and for every acre of apples, 40. The total acreage in the United States of crops commonly grown in Oregon is shown below:

TOTAL AREA IN UNITED STATES DEVOTED TO CROPS GROWN IN OREGON

<table>
<thead>
<tr>
<th>Crop</th>
<th>1919</th>
<th>1909</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>87,770,000</td>
<td>98,380,000</td>
</tr>
<tr>
<td>Wheat</td>
<td>73,100,000</td>
<td>44,260,000</td>
</tr>
<tr>
<td>Oats</td>
<td>37,991,000</td>
<td>35,160,000</td>
</tr>
<tr>
<td>Hay and forage</td>
<td>81,620,000</td>
<td>72,400,000</td>
</tr>
<tr>
<td>Potatoes</td>
<td>3,250,000</td>
<td>3,670,000</td>
</tr>
<tr>
<td>Apples*</td>
<td>2,500,000</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Peaches*</td>
<td>800,000</td>
<td>1,300,000</td>
</tr>
<tr>
<td>Pears*</td>
<td>300,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Plums and prunes*</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Small fruit</td>
<td>250,000</td>
<td>270,000</td>
</tr>
</tbody>
</table>

*Estimated.
The public has grown accustomed to campaigns waged by different classes of producers for the purpose of increasing the consumption of particular commodities. "Buy a Bale of Cotton," "Eat More Wheat," "Eat More Meat," "Eat More Lamb," are all familiar slogans. As such special weeks set aside by executive proclamation to encourage greater consumption of prunes, or apples, or cheese, as the case may be, increase in number, the facetious query arises as to the feasibility of uniting all producers behind an all-inclusive advertising campaign admonishing the people merely to "Eat More." Dietitians and conservers of public health would doubtless remonstrate against such a program, for it is probably true that as a Nation we eat enough now. It is also true that food habits are fairly well established and that we do not adjust them rapidly on the basis of the availability of some new or untried product. Nevertheless if the same amount of money were expended annually in exhibiting the merits of milk as a food as is paid in advertising various brands of chewing gum the consumption of milk might conceivably and advantageously be doubled. Not only would the health of the people be improved, but dairying, which is the keystone of a diversified farming program, would be placed on a sound basis.

Since our most difficult problem centers around marketing commodities that do not form the major part of the Nation's diet, we should carefully and conservatively appraise the possibilities that lie in causing the people to eat what we are offering for sale. The citrous growers and raisin growers of California offer a striking and encouraging example, but in these cases there are evidences that the possibilities in this field have their limitations. We may accept as our first premise the fact that the food requirements of the individual are to a certain extent fixed and that if a new source of nourishment is adopted an old one will be abandoned, except in cases where the usual ration is inadequate. Competition is likely to be confined to similar commodities; for example, baked apples, prunes, cantaloups, grape fruit, and oranges are all in the list of possible breakfast fruits, and while the consumption of one may be increased at the expense of another, none of them is likely to take the place of the breakfast cereal or of the eggs, toast, or coffee. Of course the fact that millions of people who consume little fruit and few vegetables could do so to advantage should not be overlooked. The tremendous surplus of dried prunes produced on the Pacific Coast is based on a per capita consumption of one and one-half pounds of dried product per capita per year. The diet and
health of the Nation could unquestionably be improved by increas-
ing this fivefold or more, and such an achievement would solve the
present marketing problem.

Late in June of the present year the writer paid fifteen cents
for seventeen rather undersized black cherries of the Bing variety
in front of the Department of Agriculture Buildings in Washington,
D. C. This was practically a cent apiece and would have been that
had the cherries been of normal size. This incident brings another
important factor into consideration. The price of the cherries was
simply prohibitive. At fifteen cents a pound the consumption of
this delicious and appealing product would be increased many fold
in thousands of markets. The producer is therefore interested in
getting his product on the market at a price that will encourage
consumption and must do so if food habits are to be changed.

It is doubtless true that by united and well directed action the
growers of special crops in Oregon can create markets for all that
can be advantageously produced. It is the manufacturer of chew-
ing gum, however, who has paid the advertising bill for putting
this product upon the market and, similarly, it will be the pro-
ducers of our special crops upon whom will fall the responsibility
of putting these crops upon the market.

GROUPING OF OREGON'S PRINCIPAL AGRICULTURAL
PRODUCTS WITH RESPECT TO MARKET-
ING POSSIBILITIES

Up to this point our consideration of the question of what we
can market to advantage has dealt with general principles upon the
assumption that our specific problems may be better understood in
the light of a knowledge of the distribution of population, the prin-
cipal sources from which we derive our food elements and the possi-
bilities of changing our habits of diet. We will now present a
classification or grouping of the principal agricultural products of
the state with respect to marketing possibilities. Following the
presentation of the classification in its entirety the different groups
will be discussed separately and certain definite suggestions will
be offered.

GROUP I. STAPLE PRODUCTS FOR WHICH THERE IS A RELATIVELY UNLIMITED
ESTABLISHED MARKET:

1. Wheat
2. Beef
3. Wool and mutton
4. Butter, cheese, condensed milk
5. Poultry and eggs
GROUP II. **PRODUCTS TO BE INCREASED GRADUALLY AS POTENTIAL MARKETS ARE DEVELOPED:**

1. Small fruits
2. Prunes
3. Apples
4. Sweet cherries
5. Pears
6. Peaches and apricots
7. Walnuts and filberts
8. Grapes
9. Potatoes
10. Broccoli
11. Vegetables

GROUP III. **PRODUCTS WHICH BECAUSE OF FREIGHT DIFFERENTIAL SHOULD BE PRODUCED FOR STATE CONSUMPTION ONLY:**

1. Pork

GROUP IV. **BULKY PRODUCTS WITH RELATIVELY LOW VALUE PER POUND, WHICH CANNOT BE SHIPPED OR MOVED GREAT DISTANCE:**

1. Hay
2. All green forage and silage crops

GROUP V. **PRODUCTS WHICH SHOULD BE GROWN FOR HOME COMMUNITY CONSUMPTION ONLY, EXCEPT ON SCALE LARGE ENOUGH FOR COMMERCIAL MARKETING:**

1. All specialties for which there is not a relatively unlimited established market

GROUP VI. **SPECIAL PRODUCTS FOR WHICH THERE IS AN ESTABLISHED MARKET THAT WILL NOT BE MATERIALLY AFFECTED BY Oregon’S PROBABLE OUTPUT:**

1. Legume seed (alfalfa, red and alsike clover)
2. Rye, orchard and tall oat grass seed
3. Barley
4. Breeding stock

GROUP I

**STAPLE PRODUCTS FOR WHICH THERE IS A RELATIVELY UNLIMITED ESTABLISHED MARKET**

The above heading is not intended to convey the impression that the market for any commodity is unlimited. The idea is rather that wheat, beef, wool, and mutton enter into the commerce of the world and prices are governed largely by world conditions. Even a considerable variation in the quantity produced in Oregon will not appreciably affect the situation. Dairy and poultry products are almost universally consumed, and while a regional surplus that would "bear" the market could much more readily be created than in the case of the previously mentioned commodities, nevertheless if our product is up to the standard of quality
it can be sold without first creating a consumption demand. Special points of interest will be considered in connection with each commodity of this group.

**Wheat**

Wheat is produced more generally throughout the United States than any other cereal. The total world production for 1921, not including Russia, was 3,078,887,000 bushels. The United States produced in the same year 814,905,000 bushels, of which 34.3 percent, or 279,406,000 bushels were exported against an importation of 17,251,481 bushels. The average production in the United States was 690,108,000 bushels during the pre-war years 1909 to 1913 inclusive, and 836,541,000 bushels during the eight-year period, 1915 to 1922 inclusive. This is an average annual increase of 146,433,000 bushels, or 21 percent above the pre-war average.

The acreage devoted to wheat continues to be the largest for any one crop in Oregon, amounting to more than a million acres in 1920. Wheat also has the distinction of being the greatest single source of agricultural income in the state. The largest amount is produced in the Columbia Basin region of Eastern Oregon, and in our discussion of the influence of natural conditions upon production we have assumed that wheat will continue to be the dominant factor in the agriculture of that region. The accompanying map shows graphically the distribution of wheat production in the state, each dot representing 50,000 bushels of wheat.

Since a large amount of the United States' production is exported and since this exportable surplus must be sold in competition with wheat grown all over the world, it necessarily follows that the price received for the entire wheat crop will be based upon what it is possible to receive for the exportable surplus. This being the case, the most that the Oregon farmer can expect to receive for his wheat is the world-wide market price less the actual expense of marketing and transporting, without speculation or manipulation.

In addition to numerous large and well established commercial agencies for handling export wheat, the Oregon Cooperative Grain Growers was organized in 1921 as a non-profit, non-capital-stock cooperative association.

The Oregon Association first affiliated with the Northwest Wheat Growers, Associated, a selling agency serving the cooperative associations of Oregon, Washington, Montana, Northern and Southern Idaho. The central selling agency plan has spread rapidly. Recently the American Wheat Growers, Associated, Incor-
oporated, has been established and is serving in addition to the original group of states included in the Northwest Wheat Growers, Associated, the states of Minnesota, North Dakota, South Dakota, Kansas, Nebraska, Oklahoma, Colorado, and parts of Texas.

The object of the central federated selling agency plan is an orderly marketing of wheat by selling to millers and the export trade as the demand requires, thus preventing wide fluctuations in the price which accompany the dumping of a large amount of wheat on the market in excess of the immediate demands. It would seem that this method of marketing wheat under proper management should secure for the farmers the highest price possible under world-wide conditions. The program for wheat marketing should include building up and perfecting the cooperative system in harmony with the national program. In order to make the system effective, maintain organization morale, and keep down overhead selling costs, it is essential that a large percent of the growers unite in the movement.

The reduction of the wheat acreage of the United States to the point that the exportable surplus will cease to bear the local market is recommended as a sounder and more beneficial measure than price control or guarantee by the government.

![Map showing distribution of wheat production.](image-url)
In fact, the principle of regulating production on the basis of consumption demands would appear to apply to agriculture as well as to other industries, although admittedly it is more difficult to carry out. Accurate information as to acreage, quantity on hand, etc., is hard to obtain. There is the factor of seasonal influence which may result in either a poor crop or a bumper crop from a normal acreage. Then there is the personal factor, growing out of the fact that many individuals are involved, each exercising independent judg-

ment and action, and there are said to have been cases of farmers having agreed collectively to reduce acreage and thereafter doing the contrary with the hope of profiting by the general decrease. Notwithstanding all these difficulties the principle should be applied as accurately as possible.

To guarantee the price of wheat would in all probability so disturb the operation of the natural law of supply and demand as to precipitate a condition of chaos from which we could not extricate ourselves in years. Under a regime of government regulation of price it appears doubtful if any great advantage would be derived from maintaining a cooperative association.

In harmony with a general program for reducing wheat acreage in the United States the farmers of Oregon, outside the dry-

Fig. 12. A horse- and mule-drawn outfit winding up operations on summer fallow in the dry-farming wheat belt of the Columbia Basin. No reduction in cereal acreage is recommended in this region where satisfactory yields can be secured.
farming area adapted only to wheat production, might advanta-
gageously reduce the present acreage about ten percent.

The adoption of federal grades and standards and the cooper-
ative selling of wheat have brought out the importance of stand-
ardizing our varieties of wheat. We now grow more than sixty
different varieties of wheat in the state and the investigations of
the Oregon Experiment Station reveal the fact that not more than
twelve varieties are needed to meet the requirements of our varied
conditions. Rapid progress toward standardization and the adopt-
tion of the best yielding varieties has been made in recent years
through the grain certification work carried on under the auspices
of the Extension Service of the Oregon Agricultural College. Our
wheat program should embody the rapid extension of the benefits
of this work to all wheat growing sections of the state.

Beef Cattle

According to the 1920 census report as indicated in the table
on page 20, the beef cattle of Oregon are valued at approximate-
ly 29½ million dollars, sheep at 24½ million, and dairy cattle at less
than 19 million. In all probability the low prices since the war
which have made beef production a losing venture financially, have
resulted in some retrenchment in production and slightly changed
the relative values of different classes of stock prevailing in 1919.
The actual reduction is, however, doubtless less than is popularly
assumed. On the 1920 census report basis Oregon produced 166
percent of its beef requirement, while Oregon, Washington, and
California together produced 87 percent of the beef requirement of
their combined population.

The table showing the percentage of the agricultural income
derived from different sources shows that the Blue Mountain,
Central, and Southeastern counties are the principal livestock pro-
ducing counties. The distribution of livestock is shown by the
accompanying map. It will be observed that cattle are most num-
erous in that part of the state shown by the map on page 17 to
be largely range area.

It is the range land that has made beef production an import-
ant agricultural enterprise in the state. Our cheapest beef is pro-
duced on grass, and the extent of the carrying capacity of our
ranges may be accepted as placing the limitations upon our beef
production. Much of our range land might, to be sure, be devoted
to sheep production rather than beef, providing conditions justify
such an interchange. The history of the two enterprises, however,
covering a period of years, indicates that each has been subject to
ups and downs, and that an extensive movement from one to the
other under the impulse of temporary prices is not to be encouraged. Under equally favorable natural conditions and management sheep production is more profitable than beef production, but greater application and labor are required.

It is true also that certain ranges are best adapted to cattle grazing while others are better suited for sheep. Many men with equipment for and experience in handling one class of stock are indisposed to change to another. Grazing permits on the National

Fig. 13. Map showing distribution of beef cattle.

Forests, which can not be readily changed from cattle to sheep, or vice versa, serve also as a stabilizing influence.

The conclusion seems warranted, therefore, that beef production will be continued rather indefinitely on something like the present proportions in the state. While beef production as a whole in the United States may decline under prevailing prices, the industry may be expected to survive where beef can be produced most economically. On this assumption it will pass last from the range country. Selling cattle at bottom prices and purchasing sheep at top prices, or vice versa, is not justified.

The hands through which our livestock pass in the process of marketing include country buyers, country butchers, local packing
companies, and the Portland Union Stock Yards. Of this group the Portland Union Stock Yards plays the most important part. This institution is the result of many years of development.

There are sixty-nine public stock yards in the United States, all of them operated on the same basis as the Portland Union Stock Yards.

From the standpoint of making a market for anything at any time, the stock yards have been most efficient, but the penalty for

![Graph of stock yard prices](image)

**Fig. 14. RELATION OF CHICAGO AND PORTLAND STEER PRICES (8 year average—1912-1920 inclusive).** It will cost at present close to $2.00 per cwt. more to ship cattle from Eastern Oregon points to Chicago than to Portland. This would indicate that cattle could be shipped east in July, August, September, and October, which is the general practice. In January to May, however, Portland will receive cattle from as far east as the Rocky Mountains. This applies to good steers. On the poorer grades of cattle the difference between Portland and Chicago prices is less, and very few of the lower grades of cattle are ever shipped east from Oregon.

this development has been large price fluctuations. The law of supply and demand, with its influences on prices, is put into immediate operation when a heavy shipment of livestock is received at a market having only a moderate demand. The price is reduced accordingly. Conversely, shortage of receipts at the market having a
strong demand, reflects itself in increased prices paid for the livestock received.

At certain seasons the cattlemen of Eastern Oregon find relative Portland and Chicago prices such as to justify shipping to the Eastern market, while at other times the Portland price is better. The comparative prices on these two markets by months for the eight-year period from 1912 to 1920 inclusive have been plotted by Professor E. L. Potter as shown in Fig. 14.

The following figures compiled from published reports of the Portland Union Stock Yards, give the amount of livestock received at the Portland Union Stock Yards from points without the state; the amount received from points within the state, and the approximate number slaughtered in Portland. The difference between the total amount received at the Union Stock Yards and the number slaughtered in Portland represents the approximate number which are either exported from Portland or sent to other points within the state for slaughter or for feeding purposes.

In addition to the stock movement indicated in this table, a large number of livestock, especially lambs, are shipped from the state without going through the Portland yards.

A better price for beef is the paramount need of the cattle industry and this will undoubtedly follow a diminishing supply. While waiting for more favorable conditions it behooves cattlemen to practice the greatest economy in production. Surveys of cost of production carried on by the Extension Service and Experiment Station cooperatively have focused attention upon some of the partly avoidable leaks, such as low percentage of calves, loss of cattle on the range, high feeding costs, etc. Cattlemen have displayed an interest in these factors, and a careful study of remedial measures in cooperation with the Extension Specialist in Animal Husbandry is recommended. Registered or at least pure-bred bulls are quite generally used, but greater attention can advantageously be given to type, which is not inseparably connected with either pure breeding or a pedigree. Our ranges should be brought to their highest carrying capacity by deferred and rotation grazing. Feeding practices found most profitable at the Union Experiment Station should be observed.

Greater attention should be paid to producing the class of cattle for which there is the best and most constant outlet. This is a well-bred steer weighing about 1000 to 1100 pounds and fat enough to dress out 56 to 58 percent on stock-yard weights. This type of animal does not always bring in the absolutely top price, but the extreme top is usually paid for some specialty which
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the buyers happen to need on that particular day rather than for the staple product that can be depended upon to sell well every day in the year.

It is doubtful if any general change in marketing systems for livestock should be attempted at present. Attempts have been made to reduce commission charges by establishing cooperative commission firms at the principal markets, but taking over the packing and marketing of beef and beef products is an undertaking of such magnitude that its consideration may properly be deferred until producers have acquired greater experience in cooperative endeavor.

Suggestions for operating to the greatest advantage under the present system are summarized as follows:

1. Ship to the Portland market or to other Pacific Coast cities only cattle that are fat enough for immediate slaughter. The Pacific Coast markets demand a constant supply of good killing cattle, ranging in weight from 1000 to 1100 pounds. It is not necessary that they be fattened on grain, but they must have plenty of grass and hay to put them in reasonable killing condition.

2. Adjust shipments of fat stock to the demands of the trade. From two to three weeks before the cattle are ready consult with your commission man and follow his advice as to the exact time of shipment, also follow the market receipts carefully and make frequent trips to the stock-yards in order to be better able to interpret these reports and thereby avoid shipping at the time of a heavy supply.

The importance of a relatively constant supply will be better understood when it is realized that the killing and packing plants have a capacity for a certain number of animals each day which cannot be greatly increased or decreased without correspondingly increasing the operating costs. Furthermore, the packers must feed the beef to the trade only as rapidly as the people can consume it. Any surplus must therefore be held over in the yards under excessive feeding costs and probable shrinkage. Most of these gluts may be avoided by shipping only upon the advice of the commission firm.

3. Do not ship stocker or feeder cattle to Portland or any other Pacific Coast market, since they will only have to be shipped back into the producing countries at a heavy cost of freight, shrinkage, and other expenses. The outlet for feeder cattle is in the irrigated districts producing a surplus of alfalfa. The outlet for stock cattle is to other producers in the producing territory. Some large markets, such as Denver, Kansas City, and Omaha are gateways
between the producing centers, but there are no such “gateway” markets west of the Rocky Mountains, and the Pacific Coast cities afford an outlet only for stock ready for immediate slaughter.

Market conditions for stocker and feeder cattle may, in many cases, be improved by maintaining in each livestock county a feeder cattle exchange; or more simply stated, a list of those having feeder cattle for sale and a list of those in the market for such cattle.

4. Producers should ship their own cattle and thus obtain for themselves the shippers' profit. By so doing, they will also learn market conditions as they can in no other way.

**Wool and Mohair**

The average annual production of wool in the United States for the three years 1920, 1921, and 1922, was 226,549,000 pounds. The average quantity imported annually was 342,059,000 as against an average annual exportation of 4,573,000 pounds. Our net annual importation, therefore, exceeds our annual production. In other words, the United States as a whole produces less than half its wool consumption requirement.

The sheep, like the cattle industry, is assured a permanent place in the agriculture of the state by virtue of the range land that cannot otherwise be utilized than by grazing sheep and cattle. In addition to the range sheep business, the farm flocks, which are found mostly in Western Oregon and constitute about fourteen percent of the total number of sheep in the state, may be regarded as a permanent feature of a diversified farming program destined to grow somewhat rather than diminish. Conditions also warrant an increase in the production of mohair in the state particularly in the logged off regions of the Coast and Cascade ranges. The extensive area of logged-off land is being increased at the rate of about 100,000 acres annually, and much of this land which will not ultimately be reforested can advantageously be utilized for goat grazing. Western Oregon is recognized as the source of the highest quality Angora goats in America. The Angora Journal says: “There is room in the Western United States for many millions of Angora goats, and the market for mohair has never been supplied by the domestic production. In fact, our imports annually equal the amount of mohair grown in the United States.” The sheep and goat distribution by counties is shown by the accompanying map upon which each shaded dot represents 1000 head of sheep and each open circle a like number of goats.
Oregon produces a surplus of both wool and mutton. During the first six months of the year a large number of Eastern Oregon lambs, as well as lambs from Idaho, Washington, Montana, California, and Utah, are shipped to the Portland market. During the latter half of the year, however, the bulk of the imports cease and the Portland market receives very few lambs from Eastern Oregon, or other western states.

The accompanying curve, prepared by Professor Potter, shows the relative prices for lambs on the Portland and Chicago markets and constitutes an explanation for the movements to market above indicated.

While considering the transportation to market of sheep, cattle, and hogs, the table on page 56 is of interest. It shows the freight rate in dollars per car on cattle, sheep, and hogs from different points in Eastern Oregon to Chicago, Omaha, Kansas City, Denver, Seattle and Portland. The rates were provided as of September, 1923, by Mr. L. E. Lounsberry, General Freight Agent of the Union Pacific lines.
Relation of Chicago and Portland Lamb Prices

Average prices 1912 - 1920 inc.

- - - - Chicago prices Average lamb prices
- - - - Portland prices = average top less 50%


Minimum difference - - April $1.46
Maximum difference - - July 3.50

The accuracy of these charts is not guaranteed and it is probable that the actual differences are not quite this great. The fact remains, however, that very few lambs come to Portland from Eastern Oregon from July to December and that the number of lambs produced in the Northwest is far in excess of local needs and must therefore find an eastern outlet.

Fig. 16
COMPARATIVE FREIGHT RATES ON CAR LOT SHIPMENTS OF LIVESTOCK TO DIFFERENT MARKETS FROM POINTS INDICATED

<table>
<thead>
<tr>
<th>To</th>
<th>The Dalles</th>
<th>Prineville</th>
<th>Heppner</th>
<th>Echo</th>
<th>LaGrande</th>
<th>Enterprise</th>
<th>Baker</th>
<th>Ontario</th>
<th>Crane</th>
<th>Klamath Falls</th>
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<tr>
<td>Chicago</td>
<td></td>
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<tr>
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<tr>
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<td>276.50</td>
<td>276.50</td>
<td>285.00</td>
<td>276.50</td>
<td>255.85</td>
<td>255.85</td>
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<tr>
<td>Omaha and Kansas City</td>
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<tr>
<td>Cattle</td>
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<tr>
<td>Cattle</td>
<td>83.50</td>
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<td>101.50</td>
<td>117.00</td>
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<td>130.00</td>
<td>139.00</td>
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<tr>
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<td>115.00</td>
<td>101.50</td>
<td>115.00</td>
<td>123.00</td>
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<td>121.00</td>
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<tr>
<td>Hogs</td>
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<td>116.00</td>
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<td>Portland</td>
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<tr>
<td>Cattle</td>
<td>45.00</td>
<td>109.50</td>
<td>81.50</td>
<td>79.00</td>
<td>96.00-</td>
<td>118.50</td>
<td>108.00</td>
<td>121.50</td>
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<tr>
<td>Sheep</td>
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<td>81.50</td>
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</tr>
<tr>
<td>Hogs</td>
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<td>103.00</td>
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<td>105.00</td>
<td>96.00</td>
<td>108.00</td>
<td>126.00</td>
<td>166.50</td>
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</table>
Sixty percent of the Western Oregon wool clip, thirteen percent of the clip for the state as a whole, and a considerable amount of wool produced in Idaho, Washington, and Northern California, are now marketed through the Pacific Cooperative Wool Growers. This organization performs the services of assembling, grading, scouring, baling, financing, storing, transporting, and selling to local and eastern mills and eastern buyers. In the farm flock region it replaces the peddler, junk dealer, country storekeeper, and warehouse manager who bought directly from the sheep man and sold to the regional or county buyer, who in turn sold to the wool merchant, who supplied the woolen mills and eastern buyers. Wool was not bought on grade, and the man with poor wool profited at the expense of the man with good wool.

The cooperative selling plan represented by the Pacific Cooperative Wool Growers is unquestionably superior to the old system. The association tends to fix the price, which becomes the basis of competition among the country buyers, who understand the demoralizing effect upon association members of bait prices (higher than the market justifies) on small lots here and there. The association, however, has made a splendid selling record with both the wool and mohair handled, and a program for the improvement of the sheep industry should include increasing the percentage of Oregon wool that passes through this agency.

The seller of large clips in the range section has had better market service in the past than the small flock man. He has sold directly to wool buyers, at auction sales where buyers bid in competition, or on consignment to wool warehouse companies. The sheep man operating under this system has been less inclined toward a program of cooperation, although an increasing number of large clips are being signed for sale through the association. It appears probable that the cooperative system will ultimately demonstrate its superiority as a method of selling all wool clips of the state both large and small. Under the system of orderly marketing each member receives the average price of all wool of the same grade, shrinkage, and quality as his own for the year or marketing period. He sacrifices the chance to get the peak price and is protected from the minimum price. While many will give up with reluctance the opportunity for speculation, yet the acceptance of the average pool price undoubtedly puts wool production on a more secure and stable basis.

In addition to this advantage the association possesses facilities for ascertaining market needs and prices that can hardly be
equalled by even the largest operators. The opportunities for securing advances on clips at lower rates of interest will also attract many large producers.

Cooperative selling of wool, like cooperative selling of other products, emphasizes the importance of improving quality and methods of handling. To meet the interest in this field, the Extension Service, represented by the livestock extension specialist, working through the county agents, has been conducting shearing, docking, and castrating demonstrations in Western and Southern Oregon. As a result of this work, clips are better prepared for marketing and fewer lambs are sold undocked. This project should be continued until better practices are more universally followed.

A still more important project is that of improving the quality and weight of fleeces by the culling process. A few large operators are cooperating with the Extension Service in carrying on this work over a period of years. Fleeces are weighed at shearing time and all ewes shearing less than an agreed minimum are marked for the discard. The heavier fleeced remainder are mated with well fleeced bucks. The possibilities of this work are indicated by the fact that the average weight of fleece in the United States has
increased from 1.85 lbs. in 1840 to 7.1 lbs. in 1922. Certain large operators, by culling, have brought their average fleece weight up to 12 pounds, whereas the average for the state in 1922 was 7.5 lbs.

**Dairy Products**

The production of the commodities previously considered (wheat, beef, wool, and mutton) under the group of staples for which there is a relatively unlimited established market, is confined in part to regions characterized by specialization. Both wheat and farm flocks of sheep, however, have a place in a diversified farming system, but this is conspicuously true of the dairy industry, which constitutes generally and in Oregon may well constitute the major enterprise of a diversified farming program. After having developed the production and marketing of our specialties of fruits, nuts, and vegetables to the greatest possible extent, there will remain a large part of our improved farm land which is adapted to the production of a wide range of crops and upon which the production of some staple, marketable product must be made the major enterprise. For this place in our farming system, the dairy industry is recommended alike for Western and Southern Oregon and the irrigated districts of Central and Eastern Oregon.

The reasons for thus assigning the dairy industry to this place of prominence among farming enterprises include the following:

1. The dairy cow is the most efficient transformer of farm roughage into human food, and therefore under intensive farming practices on high priced land, tends to replace the beef animal.

2. The utilization of manure, and the production of legumes and adoption of a cropping system that are associated with dairying, constitute the basis for the maintenance of soil fertility and permanent agriculture.

3. The dairy industry provides an opportunity for the even distribution and efficient utilization of labor on the farm, a matter of very great importance.

4. Dairy products are practically indispensable in the human diet. In the light of present knowledge, their consumption seems more likely to be increased than diminished.

5. Oregon is favored by a combination of conditions which contribute toward making this state a source of foundation breeding stock and commercial stock for other dairy regions.

It has been noted that the average production of milk per cow in Oregon is 4205 pounds as against 3148 for the United States as a whole, and that in production records under official test, we have been conspicuously successful. This indicates favorable conditions
for heavy production. In addition to alfalfa and red clover, which are standard hays for the dairy cow, we produce vetch, which is practically equivalent in value. Where corn cannot be produced for silage, oats-and-vetch, peas-and-barley, or sunflowers are possible substitutes, and kale may be added to the list of winter succulents in Western Oregon.

Dairy production is scattered over the entire United States because milk for human consumption must be produced near the centers of population. The manufacture of butter, cheese, and condensed milk, however, is concentrated in those areas most favorable to the production of forage crops for the use of dairy cattle.

In the United States as a whole, "it is estimated that 98,862,-276,000 pounds of milk were produced in 1921 and that 45.66 percent was used for household purposes, chiefly for direct consumption as milk; 47.03 percent was used in the manufacture of products, 4.31 percent was fed to calves, and the balance of 3 percent was either lost, wasted, or included in unspecified uses. In the manufactured products, 36.21 percent was used for the manufacture of butter, 3.7 percent for condensed and evaporated milk, 3.59 percent for cheese, and 3.39 percent for ice-cream."

The states which are producing more than 100,000,000 gallons of milk annually and which increased their production more than 40 percent during the last ten years, are Wisconsin, Minnesota, North Dakota, Washington, Oregon, and California.

At one time New York was the leading state in the production of butter and cheese, but the demand for market milk has gradually driven this activity out of the state. Wisconsin is now the principal butter and cheese producing state. At the present time, Wisconsin is producing nearly two-thirds of all the cheese made in the United States, and New York approximately one-half the remainder.

Inasmuch as many states are encouraging a larger development of the dairy industry, the question naturally arises as to the danger of overproduction in this line. This, of course, is a possibility, particularly if our per capita consumption of dairy products is to remain constant. We are, however, now consuming only about one pint of whole milk per capita per day. This estimate is based upon a survey of some 300 cities with a combined population of upwards of thirty-three million, or one-third the population of the United States. The consumption of whole milk and cream together amounts to .835 pint daily for urban people, and when the rural population is included, the average consumption of whole milk as milk and cream for household purposes, is 1.08 pints, or 49
gallons per year. Sweden, Denmark, Switzerland, and Germany all consume more than 60 gallons per capita per year.

The average consumption of butter per capita in the United States was estimated at 16.1 pounds in 1921. The average in Canada and Australia is above 25 pounds. New Zealand and Denmark consume more than the United States, and the United Kingdom, Netherlands, and Sweden about the same.

The consumption of cheese in the United States is particularly low from a comparative standpoint, being 3.8 pounds per person, while the average for France, United Kingdom, Denmark, Netherlands, and Switzerland varies from two to six times that amount. "If the people of this country would consume as much cheese as the Dane, the Englishman, the Hollander, the German, or the Frenchman, or half as much as the Swiss, it would create a market for nine billion pounds of milk more than is required at the present time."

It is apparent from these facts that the dairy industry may experience considerable expansion in the United States, provided there is a larger use of dairy products.

At the present time dairy animals represent about 20 percent of the total investment in livestock in the state of Oregon, and between 300,000 and 350,000 acres are devoted to the production of crops for their consumption. The United States census figures show that milk production in Oregon increased 46 percent between 1910 and 1920. It is estimated that we imported 4,000,000 pounds of butter-fat in 1910 and exported 2,225,000 pounds in 1920.

The Oregon Dairy and Food Commissioner's office estimates the 1921 milk production, from the 220,000 dairy cows in the state, to be 1,009,233,107 pounds valued at $20,000,000.

The accompanying graph based upon figures compiled by the State Dairy and Food Commissioner, indicates that 49 percent of the milk produced in the state is used for home consumption, 35 percent goes to creameries, 9.7 percent to cheese factories, and 6.1 percent to condenseries. (Fig. 18.)

According to census figures 37,660 of the 50,000 farms in Oregon reported dairy animals. Of this number, between 15,000 and 20,000 are raising dairy calves for future use, 25,000 are making farm butter, and 6600 reported milk as sold; 4100 sold some cream, and 12,400 butter-fat. The returns from these sales in 1919 amounted to nearly $16,000,000 or 12 percent of the total cash receipts from the sale of agricultural products. Fifty-five hundred of the farms reported 6100 dairy bulls. About one-half the number are registered bulls.
Value of milk used for home consumption, Butter, Cheese, and Condensed Milk.

Oct. 1st. 1921 to Sept. 30, 1922.

Based on figures compiled by the State Food and Dairy Commissioner.

86 Creameries
Paid Creamery Patrons
$ 7,137,194
35%

Milk used for home consumption - Ice Cream, Butter, Cheese, and Milk to Calves.
$ 9,999,321
49%

6.1%
7 Condenseries
Patrons $1,243,239

9.72%
64 Cheese Factories
Paid Patrons $1,978,502

Fig. 18
The number of registered dairy animals in the state by breeds according to the United States census is shown in the following table:

<table>
<thead>
<tr>
<th>Name of breed</th>
<th>Males</th>
<th>Females</th>
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<td>6242</td>
</tr>
<tr>
<td>Holstein</td>
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<td>2615</td>
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<tr>
<td>Guernsey</td>
<td>262</td>
<td>435</td>
</tr>
<tr>
<td>Ayrshire</td>
<td>74</td>
<td>249</td>
</tr>
<tr>
<td>Brown Swiss</td>
<td>36</td>
<td>99</td>
</tr>
<tr>
<td>Other breeds</td>
<td>68</td>
<td>234</td>
</tr>
</tbody>
</table>

If dairying is to occupy the important place here suggested it follows that we should consider well the things required to be done to consummate our goal. In this connection the following may be enumerated:

1. Improvement of the quality of our dairy products is mentioned first for the sake of giving proper emphasis to this all-important matter. Outside markets are simply not open on favorable terms to Oregon dairy products except as they compare favorably in quality with the product of other surplus-producing regions. Tillamook cheese offers a convincing and inspiring example of what
can be done along this line, but unfortunately the uniform excellence that has won favorable recognition for Tillamook cheese does not characterize all Oregon dairy products. A veteran creamery operator is authority for the statement that there has been no appreciable improvement in the quality of cream received from dairymen during the last fifteen years. The proper safeguarding of quality begins with controlling the environment in which the milk is drawn from the cow, keeping out all foreign substances, sterilizing all utensils, immediate lowering of temperature of milk or cream below that favorable to bacterial development, and lastly frequent delivery to the factory. All these factors are under the control of the dairymen, with whom rather indifferent practices have become a habit that will not easily or quickly be thrown off. New standards in this respect are urgently needed, and the benefit that will accrue to the industry as a whole from their adoption should supply the incentive. A system of paying for cream on a quality basis has recently been adopted by the leading creamerymen of Oregon and Southern Washington. The effectiveness of such a system will be increased by instituting a system of official checking to guarantee the uniform observance of the grading system. Without the official check, compromising on grade may be made the basis by one field agent of enticing patrons away from a competitor.

2. Better marketing facilities are needed to put the dairy business on a proper footing. This will suggest unpleasant memories to many who lost heavily through their connection with the ill-fated Oregon Dairymen's Cooperative League and the attempt at federating creameries, which preceded it. Nevertheless, the problem will not be satisfactorily settled until a system is created that will result in uniform grading, standardization of quality, establishing of brands, and orderly marketing. The organization of local cooperative units which may utilize the services of a central sales agency would appear to be the most logical plan. A centralized organization handling all kinds of product and owning and operating plants of various kinds over an extensive region should be avoided.

3. Herd improvement work should be continued. Approximately 49 percent of all dairy bulls used in the state now are pure bred, a percentage higher than that of any western state except Arizona and higher than that of the Middle Western and Eastern states except four in the New England group.

Approximately 4,000 head of cows are being tested for production through cow testing associations and by clubs and individual owners, and there are twenty-four county breed associations in the
state. Systematic drives for better sires are being organized on a county basis by the Extension Service, in connection with which a bull census is being taken and very direct efforts adopted to have all inferior sires replaced by those backed by production records. An effort is being made to develop a new type of cow testing association that may be participated in by a much larger number of dairymen, particularly owners of small herds.

**Average Milk Production Per Cow**

The present average production per cow and the opportunities for improvement are shown by the accompanying map.

4. Studies recently completed indicate that one of the most important obstacles confronting the proper development of the dairy industry is the small size of the average herd in the state. There is too much of a tendency to consider the dairy unit a side issue. For more economical management the 6- or 8-cow dairy herd should be doubled.

5. Disease control work should be continued. Under the circumscribed area plan of testing carried on cooperatively by the United States Bureau of Animal Industry, the State Veterinarian, and the Extension Service, great progress has been made toward eradicating bovine tuberculosis. Much has been learned about
contagious abortion and its control by the Oregon Experiment Station, and these investigations should be supported by adequate appropriation until abortion, the greatest menace to the dairy industry, is under control.

6. Our farming and cropping system in the regions where dairying is practiced must be organized around that industry. It is particularly important that pasture lands adjacent to cultivated fields be improved. Permanent pastures must be made a definite part of the crop rotation system for irrigated sections.

Poultry and Eggs

Poultry and egg production is entitled to occupy an important secondary place in a diversified system of farming in Oregon in which dairying is the major enterprise. The bulk of the poultry and eggs in the United States is produced as a by-product of farming in the Middle West. Our ability to compete with this region in the marketing of our surplus rests upon two main factors: first, a higher production of eggs obtained from commercial flocks; and second, a more highly organized marketing system by virtue of which we are able to place our graded and standardized product upon the eastern market at a premium. The Middle Western producers are attempting to deprive the poultrymen of the Pacific Coast of both of these advantages by adopting vigorous culling methods and better marketing practices. Our superior production is in part due, however, to milder summers and more temperate winters—intrinsic assets that no degree of cooperation will secure for the Middle Westerner. Neither will the farm flocks of the Corn Belt, which are mostly of the heavier breeds, quickly attain the high production that represents years of constructive breeding work on the Pacific Coast. Nor will the owners of small flocks quickly submit to the rigid grading practices that are the basis of the success of the Pacific Coast producers. These facts are all mentioned for the reason that we cannot wisely develop a heavy egg and poultry surplus in competition with states nearer the market unless we enjoy certain advantages that offset our unfavorable freight differential. It is also important that poultrymen realize what these advantages are that make competition possible, so that they may preserve and safeguard them.

The census report for the year 1919 indicates that poultry is raised on 86 percent of the farms in Oregon. There are three classes of poultry enterprises: (1) home supply flocks of about a dozen hens; (2) the farm flock of 75 to 100 hens; and (3), the commercial flock of 400 hens or more.
Not only is less difficulty encountered in getting good, high-grade eggs from the larger flocks, but when the poultry unit is of sufficient size to represent a considerable investment, better methods of handling are usually followed. For this reason the poultry department of the Oregon Agricultural College recommends either limiting the farm flock to the home supply size or making it a unit sufficiently large to command and receive proper attention. About 400 hens meet this condition.

The annual purchase of 500 baby chicks will net about 200 pullets each year to replace a like number of hens that have completed their second season’s laying, thus maintaining the flock at about 400 hens.

Fig. 21. A typical pen of Oregon’s high producing hens. The establishment of a poultry unit of about 400 laying hens is recommended as a desirable feature of a diversified farm.

The poultry industry has been growing rapidly in recent years, and this growth has been most marked in the commercial poultry group. Many poultrymen with from 500 to 1000 hens have been prospering. This is true also in California and Washington. In both states the commercial business was developed earlier than in Oregon, California being the pioneer in this field. All of the three Coast states produce a surplus of eggs.

It has been the cooperative associations that have pioneered in each of these three states in grading eggs and developing an outside market. The five principal associations of the Coast, three in California, one in Oregon and one in Washington, united in the formation of the Pacific Egg Producers in 1921 and set up their own selling organization in New York City. The Pacific Cooperative Poultry Producers (the Oregon Cooperative Association) affiliated with this organization at its inception but withdrew in December, 1922.
Poultry production as an important unit on a general farm is doubtless less hazardous than the extensive development of specialized commercial plants, although the latter have been successful to date. There is unquestionably room for a certain number of breeding plants which derive much of their income from the sale of baby chicks, breeding stock, and eggs for setting, as well as from the sale of eggs.

The cooperative selling agency appears to be essential to maintenance of our poultry industry, and a much larger percent of the eggs should be marketed through this organization.

A crying need of the industry is more information relative to the control of poultry diseases that increase in severity as birds are concentrated under the conditions of commercial operation.

Through a system of demonstration flocks conducted under the auspices of the Extension Service, the best known methods of poultry management are being brought before the poultrymen of the state. No group of producers have displayed greater interest in studying problems that confront them, and so long as this interest prevails the demonstration flock plan should be continued.

There is now a growing interest among poultrymen in developing a system for certifying the egg production records of breeders, connecting with it some plan for controlling the spread of disease. The objects of this idea are commendable. A feasible plan of financing and supervision should be devised.

GROUP II

PRODUCTS TO BE INCREASED GRADUALLY AS POTENTIAL MARKETS ARE DEVELOPED

1. Small fruits
2. Prunes
3. Apples
4. Sweet cherries
5. Pears
6. Peaches and apricots
7. Walnuts and filberts
8. Grapes
9. Potatoes
10. Broccoli
11. Other vegetables

It is within this group that we find our paramount problem. Here listed are the commodities that make up our specialties. In the aggregate they represent the source of about 16 percent of the state's annual income derived from agriculture, but just as a business establishment that could not be maintained solely on
specialties may succeed or fail through the development or non-development of its side lines, so Oregon's prosperity seems to be dependent upon establishing our fruit and vegetable industries on a profitable and permanent basis.

Of the stable commodities with relatively unlimited established market our greatest surplus product is wheat, of which we produce 440 percent of the state's consumption requirement. Contrast this surplus with that of our important fruit crops, the percentages for which are: apples 660, pears 740, small fruits 800, prunes 5000. Our smaller surplus of the staples enters into the supply of foods from which the people of this nation derive 80 percent of their nourishment. Our large surplus of specialties contributes to the remaining 20 percent of the diet. The production of two of the group which we produce in greatest abundance, namely prunes and loganberries, is confined to a relatively small area and these represent foods to which the masses of the people are not accustomed. In connection with considering the group as a whole, therefore, as well as in connection with certain members of the group, it seems appropriate to point out the fact that our chief concern is with the development of markets for our specialties. This is the primary purpose for which cooperative associations should be developed, and in the formation of a marketing program first consideration should be given to this group. It is not the intention to minimize the possibilities of further improving the system of marketing our staple crops or detract from the importance of what has already been done in this field.

Because of the relation of nation-wide conditions to any problem made up so largely of marketing a surplus, it is appropriate that we consider the question in its national aspects.

At the present time about three million acres in the United States are in deciduous fruit trees of bearing age. There is approximately one bearing apple tree for each individual. Since the number of peach, pear, plum, and prune trees collectively is about equal to the number of apple trees, it follows that the ratio of bearing deciduous fruit trees to individuals is approximately two to one.

Such studies as have been made of the relationship between fruit supply and population indicate that even under conditions where the population is exceedingly dense 75 percent of the fruit is produced near the point of consumption. Most of the people will take second and third grade fruit, for immediate use; if it is fresh, in preference to buying higher quality products. It is also true that a large element in the population is without sufficient means to purchase the superior grades and has to use the inferior grades or
none at all. This apparently means that in the deficit areas 25 percent of the fruit may be imported.

Since the population of the United States is increasing at the rate of about a million a year, the present balance between fruit trees and population will be maintained by planting two million trees annually.

That the relation between fruit trees and population is quite a variable factor, however, is shown by the following table in which the number of both bearing and non-bearing trees of different kinds is shown for both 1910 and 1920. It will be seen that for all fruits except prunes there was a marked decrease in the number of both the bearing and non-bearing trees, while the trend in the case of prunes was strongly in the opposite direction.

### TREND OF TREE FRUIT PRODUCTION IN UNITED STATES 1910-1920

<table>
<thead>
<tr>
<th>Fruit</th>
<th>1920 Bearing</th>
<th>1910 Bearing</th>
<th>1920 Non-bearing</th>
<th>1910 Non-bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>115,309,000</td>
<td>151,323,000</td>
<td>36,195,000</td>
<td>65,792,000</td>
</tr>
<tr>
<td>Peaches</td>
<td>65,646,000</td>
<td>94,507,000</td>
<td>21,618,000</td>
<td>42,266,000</td>
</tr>
<tr>
<td>Pears</td>
<td>14,647,000</td>
<td>15,172,000</td>
<td>6,052,000</td>
<td>8,804,000</td>
</tr>
<tr>
<td>Plums</td>
<td>7,809,000</td>
<td>14,688,000</td>
<td>2,497,000</td>
<td>4,774,000</td>
</tr>
<tr>
<td>Cherries</td>
<td>10,788,000</td>
<td>11,822,000</td>
<td>3,695,000</td>
<td>5,622,000</td>
</tr>
<tr>
<td>Prunes</td>
<td>12,643,000</td>
<td>9,757,000</td>
<td>6,878,000</td>
<td>2,150,000</td>
</tr>
<tr>
<td>Total</td>
<td>226,842,000</td>
<td>297,269,000</td>
<td>76,935,000</td>
<td>129,408,000</td>
</tr>
</tbody>
</table>

The trend of tree fruit production in Oregon during the last decade is shown by the following table. It will be noted that the number of bearing trees has increased 50 percent or more for each kind of fruit, while the non-bearing trees have decreased, prunes again constituting an exception in that the number of bearing trees increased 70 percent, while the number of non-bearing trees trebled.

### TREND OF FRUIT PRODUCTION IN OREGON 1910-1920

<table>
<thead>
<tr>
<th>Fruit</th>
<th>1920 Bearing</th>
<th>1910 Bearing</th>
<th>1920 Non-bearing</th>
<th>1910 Non-bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>3,315,000</td>
<td>2,030,000</td>
<td>500,000</td>
<td>2,240,000</td>
</tr>
<tr>
<td>Peaches</td>
<td>413,000</td>
<td>273,000</td>
<td>30,000</td>
<td>508,000</td>
</tr>
<tr>
<td>Pears</td>
<td>727,000</td>
<td>274,000</td>
<td>215,000</td>
<td>796,000</td>
</tr>
<tr>
<td>Cherries</td>
<td>395,000</td>
<td>223,000</td>
<td>89,396</td>
<td>314,000</td>
</tr>
<tr>
<td>Prunes</td>
<td>2,999,000</td>
<td>1,765,000</td>
<td>1,332,000</td>
<td>428,000</td>
</tr>
<tr>
<td>Total</td>
<td>7,849,000</td>
<td>4,565,000</td>
<td>2,166,396</td>
<td>4,286,000</td>
</tr>
</tbody>
</table>

The relative importance of the different kinds of fruits produced in the state is shown by the accompanying graphs, entitled Oregon Tree Fruit and Oregon Small Fruits. (Figs. 22, 23.)
OREGON TREE FRUIT

Total Production 10,345,000 bu.
(Based on 1920 U.S. Census)

- Apples 6,921,000 Bu. 67%
- Pears 761,000 Bu. 7%
- Peaches 504,000 Bu. 5%
- Prunes 2,151,000 Bu. 21%

Small Fruits

The total acreage of small fruits in the United States in 1919 was 250,000. Of this amount 120,000 was in strawberries, 50,000 in raspberries, 4,000 in loganberries, 46,000 in blackberries and dewberries, and 17,000 in cranberries. Of the strawberry acreage, Oregon grew 2800 acres. The principal strawberry producing states were Tennessee with 10,900, Arkansas with 8,300, Missouri with
OREGON SMALL FRUITS

Total Production 18,977,000 Qts.

(Based on 1920 U.S. Census Report)

Fig. 23

8,600, Michigan with 8,000, and New Jersey with 5,000. The summary statement for raspberries and loganberries does not show these items separately but does indicate that the total production was 122,600,000 pounds* of which 23,350,000 were produced in New

* Census figures given in terms of quarts translated to pounds on basis of 2 pounds per quart.
York; 15,320,000 in Michigan; 11,520,000 in Washington, and 24,044,000 in Oregon. The principal part of the Oregon production was loganberries, which amounted to 20,400,000. The total production of blackberries and dewberries was approximately 80,000,000 pounds. The largest producing state was Texas with 12,600,000 pounds, with Washington producing 7,400,000 pounds, and New Jersey, Michigan, Missouri, Oregon, and California producing between 4,000,000 and 6,000,000 pounds each.

Fig. 24. Map showing distribution of green fruits

Mild climate, fertile soil, and sufficient moisture make a condition that is almost ideal for the production of small fruits and vegetables in the Willamette Valley and Coast region. We are now raising much more than is needed to supply our present population or markets that can be supplied with fruit and vegetables in fresh condition. Therefore, to take advantage of our natural conditions, it is necessary that the surplus of these products be marketed as canned or dried goods. It would appear, then, that the highest development in this particular territory will only be reached by the expansion of the canning industry, and so again we are met by the same difficulties that we meet with in attempting to market other commodities; that is, the lack of standardization of pack, uniformity
of quality, and centralization of salesmanship. To develop properly the small fruit and vegetable business in Western Oregon there should be organized cooperative canneries in a few centers of intensive production. These canneries should be grower-owned and grower-controlled, and each should pack only the products of its members. These different canneries should then be federated into one large selling agency which would have the right, in addition to selling goods from all the canners, to place inspectors in the different canneries to see that goods were packed according to specifications. In this way we could eliminate ruinous competition amongst the different canneries, and soon build up a reputation for Oregon canned goods that would place them in all of the large consuming centers as suitable products. This is the only way in which products of this character can be merchandised throughout the year. It must always be borne in mind that the law of supply and demand operates continuously, and the only modification possible is to regulate the supply at the point of consumption so that it at no time exceeds the demand for the commodity.
Loganberries. As indicated by the circle appearing under the title "Oregon Small Fruits," it will be noted that loganberries constitute 55 percent of this class of fruits. Eighty-five percent of all the loganberries produced in the United States are grown in Oregon.

Increasing difficulties in marketing culminated in a crisis in 1923, and a large percent of the crop remained in the fields unharnested. Ruling prices were much below the cost of production, and most canners refused to take the berries at any price. Growers are now confronted with the alternative of pulling out the vines or increasing consumption demands. Since the berry has sufficient merit to guarantee its ultimate acceptance, and since Oregon enjoys a virtual monopoly in its production, every effort should be made to preserve the industry. A disease known to pathologists as mosaic is making inroads on the industry, but the disease is susceptible of control. The problems besetting the grower from a production standpoint are not greater than those associated with other crops.

A brief history of the industry may throw some light upon the present problem. The loganberry was discovered and developed by Judge J. H. Logan of Santa Cruz, California. The crop began to make its appearance in Oregon markets about 1907. Its newness and palatability created for it a ready demand as a fruit for fresh consumption and canning. Yields secured were large, and a period of rapid increase in planting ensued.

About 1915 the Phez Company launched an extensive national advertising campaign for the sale of loganberry juice. The product quickly began to take its place among popular soft drinks throughout the United States, and the Phez Company reached out to contract for a larger and larger acreage. This forced keen bidding on the part of the canners who had developed a market for the canned product. These were the heydeys for the loganberry grower, but unfortunately also the forerunners of his doom. Many yielded to the temptation to break their contracts with the Phez Company, which, because it was forced to pay so much for its raw product and doubtless for other reasons associated with management, was forced out of business. The goose that was laying the golden egg, or more literally speaking, the organization that was developing the market for the new product, was killed. Doubtless the progress of the canners in developing an outlet for canned loganberries was also impeded. The resulting situation, supplemented by a large pack of berries purchased at high prices in 1921 and unsold in 1922, has combined to bring on the crisis of 1923.
Fig. 26. A cluster of loganberries suggesting the prolific bearing qualities of this Oregon specialty. A small sales tax levied for the purpose of creating a fund for advertising and demonstrating its use would aid in preserving the industry. Organizing the growers is the key to the situation.

It appears that we should now attempt to build a substantial foundation for the industry that has experienced the spectacular rise and fall herein briefly sketched.
The following statement on the loganberry situation submitted by C. J. Hurd, specialist in marketing for the Extension Service, is quoted in full:

"The loganberry is the only commodity in the production of which Oregon has a practical monopoly. With the exception of a small territory in California and in Western Washington, all of the loganberries produced in the United States are produced in Western Oregon. It is estimated that something like 7,000 acres were in loganberries in the state last year. This is only a small percentage of the land that is suitable for the growing of this fruit. The average production per acre is estimated at two tons, while many of the plantations yield from four to six tons per acre.

"This fruit comes in direct competition with raspberries as produced generally throughout the United States, and since raspberries are well known and loganberries very little known, they compete in a new market on very unequal terms. Therefore, if we expect to expand our market for this fruit, it will require a concerted campaign of advertising that will be continuous for a number of years until the habit of eating the fruit is well established. A few years ago such a campaign was put on and the fruit was introduced in both dried and canned form, generally throughout the Middle West and Canada. Owing to war conditions and the fact that the price of green fruit advanced to an exorbitantly high figure, the advertising was discontinued and as a result it has been almost impossible to sell this year's crop, which will probably result in a material reduction of the acreage harvested next year.

"There is no doubt that there are a great many yards that should be destroyed. No yard that will not produce at least two tons per acre will be profitable, but yards that have been well cared for and are on suitable land should not be destroyed at this time, as there is no question but what the demand will be better in the future.

"Since it is probably impossible to secure 100 percent of the growers in any organization, it is suggested that an agreement be drawn up authorizing every canner or packer to deduct a certain percent from each grower's fruit before paying for it. The fund so raised should be turned over to the advertising committee selected by the growers' organizations and private packers contributing to same, this fund to be used for advertising the berry by demonstration and in national publications.

"The greatest blow that the industry has ever received was the extremely high price paid by private canners and packers a few years ago when from 10 to 13 cents per pound was the prevailing
This resulted in a very high priced finished product being placed on the shelves of the retail grocers, a large amount of which is still on their shelves, held at a price that the consumer will not pay. To illustrate, in a large retail grocery store in Baltimore, Maryland, last winter, I inquired if they had dried loganberries for sale. The clerk informed me that they had. When I asked the price it was 75 cents per pound, and he stated that there was at one time a very good demand for dried loganberries, but when women came into the store and asked for loganberries and were told that the price was 75 cents, they immediately inquired for something cheaper and as a result sales did not average as much as five pounds of loganberries per week. This demonstrates to my mind the necessity of a strong growers’ organization that would not permit the price of its commodity to go so high as to reduce the consumption of the product."

**Other Small Fruits.** Since no particular problem confronts us with respect to the marketing of our raspberries, blackberries, strawberries, or gooseberries, they will not be discussed separately. The general recommendations already set forth for the small fruit are applicable, however. By observing this program of increasing production as markets are developed, our small fruit industry should undergo consistent development until it occupies a much larger place in our agriculture than at present.
Dried prune production in the United States is confined to California, Oregon, and Washington. According to the 1922 year book of the United States Department of Agriculture, importation of prunes and plums into the United States ceased in 1908. We began exporting prunes about 1905, and by the year 1921 our exports had grown to 118,000,000 pounds. During this year (1921) of our exports 3.4 percent went to Belgium, 9.5 percent to Canada, 3.2 percent to Denmark, 18 percent to France, 24 percent to Germany, 3.4 percent to Netherlands, 5 percent to Sweden, 28 percent to the United Kingdom, and 4.6 percent to all other countries.

Of the 250,000,000 pounds of dried prunes produced in 1922, Oregon grew 58,500,000 pounds, or 23 percent. We are, as has been noted, producing enough prunes in Oregon to feed a population of 39 million, and enough in the three states combined for 165 million people. What the three states have produced and marketed represents the total consumed and exported. We could not expect the present consumption to be higher than the output heretofore has made possible. At present it stands at but 1 1/2 pounds of the dried fruit per capita. Ostensibly it should be possible to increase this consumption rate sufficiently to take care of the growing output, but this will entail an aggressive selling campaign.

Not only did the number of bearing trees increase from 9,757,000 in 1910 to 12,643,000 in 1920 in the United States, but the

Fig. 28. A continuation of the loganberry field shown on the opposite page. Our investment in this industry is sufficiently large to justify more extensive experimentation to determine new and better ways of putting the product on the market.
number of non-bearing trees trebled. The same was true of the non-bearing trees in Oregon.

While the situation is not necessarily alarming, suspension of further planting until a market has been created for bearing trees and those soon to bear, would appear to be justified. Likewise, the growers should realize the necessity of supporting a well-organized selling program.

About half of Oregon's present prune crop is marketed through farmer-controlled cooperative associations, much the largest of which is the Oregon Growers' Cooperative Association. Through the work of this organization new markets both in the United States and other countries are being opened up rapidly.

An effort has been made recently to unite the different cooperative selling associations under a common sales agency, but no plan immediately acceptable has been proposed. The interests of the growers, however, would be served by the consummation of such a plan.

**Apples**

The number of bearing apple trees in the United States slightly exceeds the combined number of all the bearing peach, pear,
prune, and plum trees. Apple production is very widely distributed. The states having five million or more apple trees in bearing are New York, Pennsylvania, Ohio, Illinois, Michigan, Missouri, Virginia, West Virginia, and Washington. Those having more than a million trees non-bearing are New York, Pennsylvania, Ohio, Illinois, Michigan, Missouri, Virginia, West Virginia, North Carolina, Kentucky, Tennessee, and California. The states having between five hundred thousand and a million trees not in bearing are Maine, Massachusetts, New Jersey, Indiana, Wisconsin, Minnesota, Iowa, Kansas, Maryland, Georgia, Arkansas, Washington, and Oregon.

Outside of New England, the states which in 1920 sold more than a million bushels of apples are Ohio, Illinois, Michigan, Missouri, Kansas, Virginia, West Virginia, Arkansas, Idaho, Colorado, Washington, Oregon, and California. Oregon supplied five percent of the apples which were sold off the farm. Of the apples produced on the Pacific Coast, 90 percent were sold; of those produced in the New England and Middle Atlantic states, 75 percent; and in the North Central states, less than one-half.

Oregon alone produces 660 percent of the state's consumption requirement. The three Pacific Coast states produce 485 percent of the requirement of their combined population.

There has been much speculation about the permanence and stability of the apple industry in Oregon. Our surplus is sold largely in the form of a fancy pack in Eastern and European markets. Growers in the Atlantic Coast region have not until recently made any concerted effort to compete for this trade. Our ability to compete for the fancy trade rests probably more upon the greater assurance of a crop than upon any other factor. Crop failure because of frost is a severe handicap in most of the eastern apple-growing regions. Because of their advantage in assurance of a crop, together with the experience already acquired by Western growers, it is probable that the market for the better grade of apples can be maintained. The under grades coming largely from the orchards that are too small to be handled on a strictly modern commercial basis complicate the selling problem. The industry would be benefited by the elimination of this class of orchards. In other words, there should be a reduction in the apple acreage that falls between the home orchard and commercial orchard class. New plantings should be either simply for family use or large enough to insure the best type of orchard management. It is, however, probable that cherries, pears, prunes, small fruits, and nuts offer greater opportunities than apples.
An effort is being made to bring about cooperation between the several different apple selling agencies of the Pacific Northwest. The need for such an arrangement has for some time been apparent to those who have made a study of the situation.

Cherries

This is one of the state's best specialties, susceptible of far greater development than has been attained to date. Very few regions in the United States produce the sweet cherry, of which Royal Ann, Bing, and Lambert are the leading commercial varieties. Low yields due to lack of proper pollenization and the recent appearance of the cherry maggot are two factors tending to curtail production, but the Oregon Experiment Station has found a prac-
tical solution for both these difficulties. Professor W. S. Brown, head of the department of Horticulture of the Oregon Agricultural College, holds that the yield of cherries from the present acreage might be increased fourfold by grafting in pollenizing varieties where needed and by practicing better methods of pruning, cultivation, spraying, etc.

Cherries are marketed both for fresh consumption and canning. More recently some varieties, notably the black Republican, have been successfully marketed in the dried form. In the marketing of the cherry in both the canned and fresh form there appears to be great opportunity for expansion. No fruit on display invites purchase more urgently than does the large, luscious Oregon cherry, but as pointed out earlier in this bulletin, the price on the Eastern market is often prohibitive. If the problem of getting them to market so that they can be sold at a reasonable price is solved, the Oregon cherry will find ready sale in hundreds of thousands of fruit stands and grocery stores in the United States. This reduction in marketing costs is the paramount problem and should be made a subject of special study. Loss by spoilage should be reduced to the minimum by picking at the right stage of ripeness and by proper refrigeration. A lower selling price and more rapid movement would also tend to limit this loss, which the retailer takes into account in fixing his price.

Pears

More than 25 percent of the bearing and 40 percent of the non-bearing pear trees in the United States are on the Pacific Coast. The largest increase in acreage has been in California. In Oregon the number of bearing trees increased from 273,500 in 1910 to 727,000 in 1920, but the number of non-bearing trees during this same period decreased from 795,600 to 214,500.

Oregon is able to put a fancy pear upon the Eastern market at a time when there is little competition from other sections of the country. By skill and diligence the growers are able to hold in check the pear blight that prevents the successful growing of this fruit in many parts of the country. While extensive planting, such as has characterized the prune, apple, and loganberry industries, is not to be encouraged, a gradual increase in the present acreage where methods of production and marketing are well established is doubtless justified.

Peaches and Apricots

In 1910 Oregon had 273,000 bearing peach trees and 508,000 non-bearing. In 1920 there were 413,000 bearing trees and fewer
than 30,000 non-bearing. The area in which the new planting is increasing is in states that are farther south than Oregon. Peach and apricot production is confined to certain regions in the state where conditions are favorable. Canners generally are not eager for this product and production may well be confined to supplying the de-
mand for fresh consumption and home canning within the state. The Wasco county canners are using apricots and encouraging apricot production in that region.

Walnuts and Filberts

The production of both walnuts and filberts in the United States is less than the consumption. During the three years, 1919, 1920, and 1921, we imported annually on the average 36,700,000 pounds of walnuts, of which about two thirds were unshelled and one third shelled. We imported 19,500,000 pounds of filberts, the ratio of unshelled to shelled being about the same. In 1921 the value of the walnuts imported was nine and a half million dollars, and the value of the filberts about two million four hundred thousand dollars. Of our walnuts 14 percent came from China, 41 percent from France, 27 percent from Italy, and 18 percent from all other countries.

In 1922 we imported 14 million pounds of filberts from Italy, 3 million from Spain, 3 million from European Turkey, and one million from all other countries combined.

Commercial production of English walnuts in the United States is confined to California, Oregon, and Washington. In 1922, according to the United States Department of Agriculture, California produced 59,091,000 pounds, Oregon 462,000 pounds, and Washington 97,000 pounds. The value of the English walnut crop in California varied from eight to ten million dollars annually during 1919-20 and 1921.

The industry is young in Oregon, but under favorable conditions both yield and quality are satisfactory.

Fred Groner, veteran walnut grower of Washington county and recognized authority on walnut production in Oregon, says: "Walnut orchards, suitably located, will bear as many and as good or better quality nuts as can be raised in California. Land here costs from one-third to one-half as much, and since we do not need to irrigate an investment here will pay much better net returns."

It is necessary to resort to artificial drying of walnuts here, but the process is not expensive. A gradual extension of walnut acreage in Oregon would appear to be justified, but before an orchard is started the best available advice should be secured regarding the adaptation of the land for walnut growing. Better grading practices should be adopted, and growers should be organized for cooperative selling. It is possible that some feasible plan of cooperation with the walnut growers of California may be devised.
The chief concern of the filbert grower, to date, has been to secure nursery stock of good pollinating commercial varieties. Returns per acre from small plantings have been quite sensational, and there are some evidences of "a filbert boom." The hazelnut, closely related to the filbert, is indigenous to Western Oregon, and the indications are that the filbert will thrive here.

Dorris Brothers of Springfield, Lane county, Oregon, are the leading commercial growers of filberts in the state. Mr. B. F. Dorris says:

"There is no longer any question but that the Willamette Valley and locations in Oregon similar in soil and climate are producing today a satisfactory yield per acre of the highest quality filberts in the world. There is no other place in the United States outside of the western coast of Washington where the same results may be secured, although it is probably possible to grow filberts after a fashion elsewhere in the United States.

"Filberts can be produced on comparatively cheap land; that is, there is still good land to be had at a reasonable price in the Willamette Valley. It is the quality of the land and not the price that is the controlling factor, however, and no one could give a blanket endorsement of a whole valley as being suitable for filberts or any other crop. Filberts want a good, well drained land, but it is not necessary to have the highest quality of gardening soils."

It would seem advisable for filbert growers, as well as walnut growers, to organize cooperatively for selling. The industry should be increased gradually as selling facilities and markets are developed. Such a suggestion may seem inappropriate in connection with an industry so young, but experience has shown that no class of growers is exempt from the application of the principle involved.

Grapes

Commercial grape production is confined largely to Josephine, Douglas, and Wasco counties. Tokay grapes and other varieties of the best quality are produced in these regions. The Josephine county growers have benefited greatly by developing a local cooperative selling organization. This procedure is to be recommended. Should the production of grapes become more general, the different locals could then federate.

Potatoes

According to the Year Book of the United States Department of Agriculture, the average production of potatoes in the United States for the ten-year period 1913 to 1922 inclusive, was 378,000,000 bushels. The lowest yield during this time was 287,000,000 bushels,
and the highest 451,000,000 bushels. Owing to the bulky and perishable nature of the crop, neither imports nor exports are extensive, each amounting to about one percent of the crop. The average acreage devoted to the production of potatoes during the above ten-year period was 3,882,800 and the average yield per acre 97 bushels.

The yield from a given acreage is subject to very wide fluctuation under the influence of seasonal conditions, and price variation is even more violent than that of yield. The relation of yield to price is shown by the following chart issued by the United States Department of Agriculture. Years of low yields and high prices are usually followed by an increased acreage, larger yields, and lower prices.

While potatoes are produced in all parts of the United States, the heaviest production is found in New England and along the northern tier of states. The 19 states producing a surplus of late potatoes are Maine, Vermont, New York, Pennsylvania, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Montana, Wyoming, Colorado, Utah, Nevada, Idaho, Washington, Oregon, and California.

Oregon normally plants about 45,000 acres of potatoes yielding about 5,000,000 bushels. Our annual exports during the past four years amounted to 1400 cars or 970,000 bushels. Our imports on the basis of an average per capita consumption of 3½ bushels amounted to 175,000 bushels. Oregon should export a larger portion of the total crop, but it is probable that the per capita consumption is higher here than for the country as a whole.
That the potato acreage has increased more rapidly in other western states than in Oregon is shown by the following table:

### POTATO PRODUCTION IN WESTERN STATES

<table>
<thead>
<tr>
<th>Name of state</th>
<th>1900 acres</th>
<th>1920-22 inc. acres</th>
<th>Average production in 1920-1922, 3 years bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>15,000</td>
<td>45,000</td>
<td>4,868,000</td>
</tr>
<tr>
<td>Idaho</td>
<td>5,000</td>
<td>65,000</td>
<td>11,950,000</td>
</tr>
<tr>
<td>Washington</td>
<td>15,000</td>
<td>59,000</td>
<td>8,580,000</td>
</tr>
<tr>
<td>California</td>
<td>26,000</td>
<td>75,000</td>
<td>10,140,000</td>
</tr>
<tr>
<td>Montana</td>
<td>4,000</td>
<td>42,000</td>
<td>4,970,000</td>
</tr>
</tbody>
</table>

The average yield of potatoes per acre in Oregon for the ten-year period 1890 to 1899 was 103 bushels, and for the three years 1920 to 1922 inclusive it was 108 bushels, or an increase of 5 bushels. The comparative figures for our neighboring states for the same periods were: Washington 127-145; Idaho 128-183; California 89-142. We have not, therefore, kept pace with these states in the matter of increasing our yields. This is due principally to the fact that larger yields are obtained under irrigation, and the potatoes of Washington, Idaho, and California are mostly grown under this system, while those of Oregon are mostly grown without irrigation.

![Map showing distribution of potatoes.](image)
Of our 1400 cars for export about 500 come from the three Eastern Oregon counties of Malheur, Umatilla, and Deschutes, and 900 from the Western Oregon counties of Marion, Clackamas, Washington, Multnomah, Linn, Columbia, Lane, and Yamhill, which rank in production in the order named. Malheur county potatoes are produced largely for August and early September markets and do not compete with Western Oregon stock. A goodly portion of the Umatilla and Deschutes county crop is sold as seed stock to growers in Western Oregon, California, or the Yakima region of Washington. The Western Oregon surplus goes mostly to California.

Freight rates place a fairly definite limit upon the distance which potatoes can be moved. The rates per hundred from Portland to different points by rail are as follows: to points on lower Missouri and Mississippi rivers and East Texas $1.10; to Arizona, Mountain States, and Western Texas $1.06; Los Angeles, $0.56½; San Francisco $0.35½. Water transportation costs 20 cents per hundred from Portland to San Francisco, 30 cents to Los Angeles, and 52 cents to Gulf points. In view of these rates the potential market for our surplus potato stock would appear to be confined to California, which may be reached by either rail or water, and the Gulf states, which may be reached by water transportation through the Panama Canal. Better cold-storage facilities en route and shorter time in transit are required to stimulate shipment by water.

The Portland market has formerly been depressed by the dumping upon it of large quantities of low-grade potatoes from the Willamette Valley and Yakima. Since grading is now compulsory, these lower grades will be kept off the market or at least will not compete with better grades on equal terms.

Our great opportunity in potato production, however, lies in providing seed stock to the growers of California, Yakima, and possibly the Gulf States. These regions are all dependent upon renewing their seed stock from outside sources. We do not now have, however, the facilities for building up and holding this seed trade. A quality guarantee is what is required. No surer way of ruining our reputation could be devised than selling of diseased and inferior potatoes as Oregon seed potatoes. Certain seed dealers are doing all they can to develop a high-grade seed business, but the situation will not be properly met until local cooperative units are developed under which rules of grading and disease control can be enforced. As these locals become established in the more important potato centers, plans can be developed for perfecting a central cooperative selling agency. Mr. E. R. Jackman, farm crops specialist
for the Extension Service, has prepared the following statement bearing upon the development of our seed potato trade:

“The matter of developing this seed trade is not simple. The way has been and is being paved with the seed certification work carried on by the Extension Service. Through this work most of the potato growers in the counties with county agents have now become acquainted with potato diseases and some of the methods of combating them. They have quite generally learned to distinguish between good and poor seed.

“Some of the seed companies are trying in a systematic way to locate reliable growers and build up good seed stocks, but their efforts must be limited to a comparatively few growers, and they must look at the sale of seed from the standpoint of immediate profits, not the development of an industry. Potato dealers, through whom most of the seed business is conducted, can never be expected to do much constructive work of this kind because they lack the knowledge and have no organization for field inspections. Seed dealers are always at the mercy of unscrupulous farmers just as seed buyers are at the mercy of unscrupulous dealers.

“It is evident then that none of the existing trade channels can develop the seed business to the point where Southern buyers can be at all sure of their seed. California* grows thousands of acres of Burbanks to supply local and neighboring markets. Growers there are anxious to buy seed here but cannot depend upon it, due to the lack of knowledge on the part of Oregon growers, at times to the dishonesty of both dealers and growers, and the lack of any organized attempt to deal with this demand.

“It would seem, then, that in order successfully to develop it, there must be some new organization created. In Umatilla county, the Weston Mountain growers united into an organization for the express purpose of growing seed. They have been wonderfully successful, and if they continue their present efforts it will only be a matter of two or three years until they will have a steady market for all of their product. The initial success there would indicate that other concentrated potato growing districts could do the same. The Deschutes County Association did so much toward educating the growers about grading and putting out a reliable product and educating the public about the value of buying a reliable product, that Deschutes growers still net more than Willamette Valley growers in spite of their big freight handicap. This association, although it has been inactive for several years, is still responsible for the sale of much seed stock in Yakima.”

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* California devotes between sixty and seventy thousand acres to potatoes each year. It will take between nine hundred thousand and a million bushels of seed to plant this area. If this seed were all supplied by Oregon it would require the entire production of nine or ten thousand acres.
Broccoli

Broccoli growing on a commercial basis has been successfully developed in Douglas county. Absence of weather sufficiently cold to kill this hardy winter vegetable together with freedom from rain at harvesting time is the combination of circumstances favoring production there. A system of marketing has been evolved as the industry has grown, and there appears to be no serious difficulty in disposing of the output, valued at about $250,000 per year. Encouraged by the success of the Douglas county growers, other communities have been eager to engage in broccoli production. Several such attempts have terminated in failure. Before devoting any considerable acreage to this purpose growing trials should be made and these should be continued over two or three seasons before conclusions are drawn. If there appear to be no obstacles in the way of growing and harvesting a high quality product, sufficient acreage should be pledged to broccoli growing to make possible marketing on a car-lot basis. The services of an established sales agency should be secured if possible.

Other Vegetables

No attempt will be made to discuss separately each of the vegetables that are successfully grown within the state. Canneries and drying plants offer the best outlet for exportable surplus. Vegetable growing on a commercial scale will naturally develop around centers where fresh vegetables are consumed and around the canneries and driers that have developed outside markets.

GROUP III
PRODUCTS WHICH BECAUSE OF FREIGHT DIFFERENTIAL SHOULD BE PRODUCED FOR STATE CONSUMPTION ONLY

Pork

It may not be apparent just why pork should be singled out for classification as a commodity which, because of unfavorable freight differential, should be produced for state consumption only. The explanation is found in the fact that if we produce a surplus it will come in competition with the Corn Belt pork in the Eastern markets. The local price would tend to be the Chicago price minus the freight which would mean that the Oregon grower would receive less for his hogs net on the farm than the Corn Belt farmer. So long as we produce slightly less than enough for our state consumption, the price here tends to be
the Chicago price plus the freight. Our pork, unlike our beef and mutton, is not produced upon the cheap range lands but upon the farms. We have no advantage in the way of lower costs of production that enables us to compete with the Corn Belt farmer and absorb the payment of a much higher freight rate.

![Fig. 34. Shoats on dwarf essex rape.](image)

Our animal husbandry department has developed a pork production program which if adhered to approximately will tend to maintain about the proper ratio between pork production and population in Oregon. This program is as follows:

1. Dairy farms that do not sell whole milk and raise not more than one-half of their calves should raise one pig for each cow milked.
2. Grain farmers should raise about one pig for each ten acres of grain.
3. Garbage should be used for fattening pigs. The garbage may be fed alone up to the last 30 days of the finishing period, during which they should have what grain they will eat. During the last week they should have no garbage but a full grain ration.
4. When pigs are fed entirely on marketable feed and good pasture, they should bring a price per 100 pounds approximately 6 to 6½ times the price of the grain used. We do not recommend that pig raising be attempted where they cannot be used as a means of marketing by-products such as skim milk, stubble, garbage, waste fruit, etc.
5. Pig raisers should not buy feed other than tankage or similar supplements and farmers who do not have the grain on their own farms should not raise pigs. There are a few exceptions to this.
Our pork production at present is somewhat under the schedule proposed rather than over it. According to the estimates of F. L. Kent, federal statistician, Marion county now leads in number of hogs. Clackamas, Linn, Lane, Douglas, and Wallowa are other heavy producers of pork.

Cooperative shipping of hogs was introduced in Lane county about 1915 by the market committee of the Grange working in cooperation with the county agent. This resulted in a lower margin between the local price and Portland price and in addition has had the effect of improving the quality and grade of hogs shipped. Since that time this method has been followed somewhat intermittently in a number of other counties.

GROUP IV

BULKY PRODUCTS WITH RELATIVELY LOW VALUE PER POUND WHICH CANNOT BE SHIPPED OR MOVED A GREAT DISTANCE

Hay and Forage

Hay and forage crops represent about one-third of the value of all farm crops produced in the state annually. Virtually all forage crops and a large percent of the hay are consumed on the premises where they are produced. A considerable quantity of hay is sold for intrastate shipment, but practically none is exported. Hay moves from the alfalfa-growing sections of Eastern and Central Oregon to the dairy sections of the Willamette Valley and Coast region. There is also movement of hay between points in the Willamette Valley. The Yakima Valley is the chief source of the hay imported into the state.

It is considered better practice generally to convert hay into more condensed products by feeding it locally rather than resorting to shipping. In bringing new land under cultivation it is often impossible to avoid a surplus of hay at the outset, but this can be overcome by increasing the number of livestock as the farming system becomes better organized.

The Oregon Cooperative Hay Growers was organized in 1921 and has handled a good percentage of the hay exported from western Umatilla and northern Morrow counties. Its operations have since been extended into the alfalfa growing sections of Crook and Deschutes counties. More recently a movement has been launched for securing more complete control of the export hay of the Northwest by organizing the Northwest Hay Association, which will include the growers of the Yakima Valley and Eastern Washington, as well as Oregon growers.

This is in line with the general program of more orderly marketing.
GROUP V

PRODUCTS WHICH SHOULD BE GROWN FOR HOME OR COMMUNITY CONSUMPTION ONLY EXCEPT ON A SCALE LARGE ENOUGH FOR COMMERCIAL MARKETING

This classification includes all fruits and vegetables and in fact applies to practically all agricultural commodities. It is a statement of principle rather than a division under which certain commodities may be listed. The point is well illustrated by the case of a broccoli grower who, having grown a crop in a community where no other broccoli was grown, addressed a letter to the department of horticulture of the Oregon Agricultural College asking for information as to how to proceed to market his crop. As a matter of fact there was no satisfactory procedure to suggest. His home community could not consume his product. He lacked the necessary volume, experience, and trade connections to ship advantageously. His error was in becoming an isolated grower of a product requiring special marketing facilities.

This is an age of specialization in marketing. While the trend is in the direction of organizing on the commodity basis, there are recognized advantages in the concentration of production on a community basis. Hood River apples, Tillamook cheese, Dundee prunes, Rogue River pears, Douglas county broccoli, serve as illustrations in this state, and California is an outstanding example of a state that has the production of its specialties so organized by communities or districts as to facilitate organization for successful marketing through cooperative or independent channels.

The principle does not involve giving over a community exclusively to the production of any commodity. It contemplates rather that if the production of a commodity is engaged in at all beyond the point of family and local community consumption it will be on a scale sufficiently extensive to facilitate the best practices of production, grading, and marketing.

Organizing for marketing involves organizing production, geographically, in accordance with this principle, as well as organizing the individuals engaged in production. In the marketing of crops like wheat, wool, beef, pork, etc., for which there is an established market, concentration, with a view to community merchandising, is not necessary, but in marketing specialties it is important.
GROUP VI

SPECIAL PRODUCTS FOR WHICH THERE ARE ESTABLISHED MARKETS BUT WHICH WILL NOT BE MATERIALLY AFFECTED BY OREGON'S PROBABLE OUTPUT

This group, consisting of breeding stock, barley, flax, corn, alfalfa seed, grass seed, red and alsike clover seed, is relatively less important than Group I, consisting of the staple crops, or Group III, including fruits and vegetables.

Breeding Stock

Oregon breeders of registered stock, particularly of Jerseys, have thus far not fully realized upon their commercial opportunities. As previously pointed out, superior blood lines have been developed here and official records have been broken in numbers far out of proportion to our relative number of animals. This is an asset of intrinsic worth if properly exploited. Bulls, and to a less extent females with high record ancestors, should be sent throughout the United States for breeding purposes. Even the Jersey Isles offer no better source of stock from which to improve the herds of the country. Our animals are of a type which, if brought before the public, will command favor.

Breeding stock may be classed as a specialty, and as in the case of other specialties of this group the need is for an organization to develop markets. It would appear that this effort should include Oregon breeders only, as the selling program would lose point and effectiveness if a group of states were included. Expert salesman-ship ability should be the outstanding qualification of the active director of such an organization.

Barley

Barley is an excellent substitute for corn in the cool and the dry sections. It should be more extensively grown in the hot, dry districts of the Columbia Basin and should replace many of the oats grown in Western and Southern Oregon on the well drained soils. Experiment Station results and statistics compiled by the United States Bureau of Economics show barley to be the most productive of the cereals for feed purposes. The acreage in Western Oregon increases about ten percent a year.

The following table shows the relative yields of barley, winter wheat, spring wheat, and oats, as compiled by the Oregon Experiment Station for a period of three years. The figures are given on the basis of pounds per acre each year.
RELATIVE YIELD OF CEREALS PER ACRE IN WESTERN OREGON

<table>
<thead>
<tr>
<th>Year</th>
<th>Barley</th>
<th>Winter wheat</th>
<th>Spring wheat</th>
<th>Oats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>1540</td>
<td>1435</td>
<td>1070</td>
<td>1175</td>
</tr>
<tr>
<td>1921</td>
<td>1478</td>
<td>1304</td>
<td>898</td>
<td>1048</td>
</tr>
<tr>
<td>1922</td>
<td>1285</td>
<td>1308</td>
<td>622</td>
<td>794</td>
</tr>
<tr>
<td>3 yr. ave.</td>
<td>1434</td>
<td>1349</td>
<td>863</td>
<td>1006</td>
</tr>
</tbody>
</table>

**Corn**

Corn is principally used for silage purposes, but the warm areas in the Snake and Columbia River valleys and the Rogue and Umpqua River valleys, as well as the warm soils in the Willamette Valley, produce good corn for grain. The acreage should be increased by twenty to thirty-five thousand acres to do away with Eastern shipments.

**Flax**

Flax growing offers great opportunities in the Willamette Valley and shows some promise in Central Oregon. A linseed oil mill in Portland imports practically all its raw material from Montana and the Orient. Flax culture in the Willamette Valley, while very successful, is very limited because farmers believe the crop is hard on the soil. It is not, however, harder on the soil than the production of cereals of equal value.

**Clover and Alfalfa Seed**

The red and alsike clover seed of Western Oregon and the alfalfa seed of Eastern and Southern Oregon are of good quality and command a good market. Yields of two to nine bushels of red and alsike clover seed are secured in Western Oregon and still larger yields are secured under irrigation in Eastern Oregon. We have a strong export market for the clover seed. The acreage of this crop should be increased, especially in the Willamette Valley and in irrigated districts remote from railroads.

A thirty- to forty-thousand acre increase in clover seed will just about take care of the annual imports into the United States.

Grimm alfalfa seed is still imported into Oregon. Production of this variety should be developed in Eastern and Southern Oregon.

**Grass Seed**

Climatic conditions are unusually favorable for producing rye grass, orchard grass, tall oat grass, redtop and creeping bent grass
seed in Western Oregon, and timothy in the high irrigated districts. An industry amounting to a million dollars a year may be developed in Western Oregon along these lines.

PART V

COOPERATIVE MARKETING

The analysis, set forth on the preceding pages, has brought out certain problems that can only be coped with successfully by the united action of the growers through their cooperative marketing associations. This applies with particular emphasis to our specialties for which it is necessary to develop a consumption demand.

Since so large a percentage of our total output of these specialties must be marketed outside the state, and since we are so far removed from the consuming centers, we are peculiarly dependent upon the cooperative method as a system of marketing. The impelling incentive for opening up markets for our prunes, loganberries, cherries, and other crops of this class, lies with the producer himself. Acting alone, he is helpless. Acting in concert with his fellow growers through the medium of cooperative marketing associations, he can accomplish much.

Cooperative marketing, however, will not be established upon a thoroughly satisfactory basis until it is more generally accepted as a system which benefits the region and industry as a whole, performing for all the growers alike of a given commodity services which private agencies will not render. This fact is convincingly stated in the following quotation from G. Harold Powell, late manager of the California Fruit Growers Exchange, who is an acknowledged cooperative authority.

"The questions which affect the stability and permanently successful development of the fruit industry can only be worked out by the producers cooperatively. They will not be solved by anyone else, because no one but the producer has a primary, vital interest in production. They cannot be solved by an individual producer.

"The progress that has been made in every question affecting the production of citrous fruits—such as the cheaper purchase of supplies, the community protection against insect pests, community frost protection, the economical harvesting and handling of the fruit, the establishment of a citrous fruit experiment station by the State University—has resulted exclusively from the initiation and cooperation of producers. Those who handle the growers' product for them sometimes follow; they cannot lead in the progress of an industry. Their interest in the problems of production is secondary.
"The problem of distributing and marketing a rapidly increasing crop, such as equitable national distribution, the development of new markets, and effective national advertising, can be handled by producers cooperatively, and by them alone."

Eliminating the middle man, shortening the route from the producer to the consumer, and securing a price for members higher than that obtained by non-members, are the services popularly expected of the cooperative marketing association. Experience has shown, however, that cooperative associations often find it desirable to make use of existing sales agencies. Neither is it probable that the average price paid to members will be greater than the highest prices paid to non-members. The benefits of a higher general price level, lower freight rates, better credit facilities, new markets, etc., secured directly by the cooperative association, are often shared equally by non-members who bear none of the expense. All these facts tend to create dissatisfaction within the ranks of association members and emphasize the importance of a more general understanding of the real services likely to be rendered by cooperative associations, as suggested by Mr. Powell."
DAIRYING
Should be MADE the
BASIS of our
diversified FARMING
SYSTEM