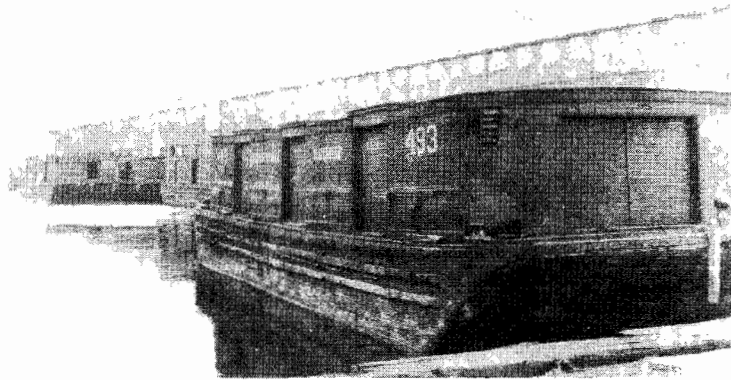


COST AND RETURNS OF  
*copy 2*  
**Agricultural Research  
in Oregon**

Excerpts from the Biennial Report  
of the Experiment Stations

by

R. S. Besse, Vice-Director



These lighter barges in New York harbor are filled with ripening Bosc pears from Oregon because of research work carried on by the agricultural experiment station. Application of the ripening and storage methods restored and widened markets and saved Oregon's commercial Bosc pear industry which brings in hundreds of thousands of dollars annually.

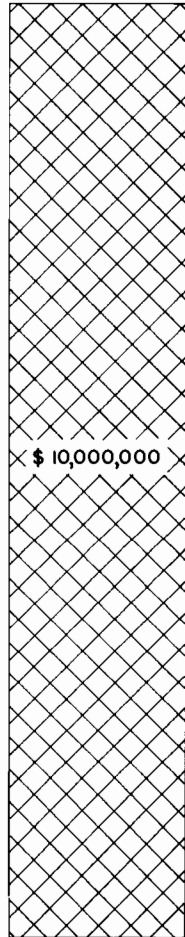
Agricultural Experiment Station  
Oregon State Agricultural College  
Cooperating with  
The United States Department of Agriculture  
and other agencies

Wm. A. Schoenfeld, Dean and Director  
Corvallis, Oregon

EXPERIMENTAL PROJECTS CLASSIFIED BY FUNCTIONS INVOLVED

	<u>Existing Projects</u>	<u>New Projects Requested by Public</u>
<u>Protecting Crops and Livestock</u>		
Control of Diseases and Pests of Crops .....	45	
Control of Diseases and Pests of Livestock, etc. ....	13	
Control of Winter Injury of Fruit Trees .....	<u>1</u>	
Total .....	59	<u>40</u>
<u>Improving Quality to Win and Hold Markets</u>		
Processing Crops for Market Demands .....	13	
Improving Storage and Ripening Methods .....	4	
Converting Waste By-Products into Economic Value .....	4	
Measuring Factors Affecting Quality .....	8	
Controlling Spray Residues, Molds and Spoilage .....	<u>5</u>	
Total .....	34	<u>24</u>
<u>Introducing, Testing, Breeding, Superior Strains</u>		
In Fruit, Vegetable and Nut Crops .....	12	
In Farm, Forage and Seed Crops .....	16	
In Sheep, Poultry and Dairy Stock .....	<u>3</u>	
Total .....	31	<u>15</u>
<u>Developing More Economical Production Methods</u>		
Propagating, Pruning, Pollinating, etc. ....	12	
Tillage, Crop Selection and Rotations .....	11	
Livestock and Game Nutrition, Fattening and Management..	25	
Poultry Management, Housing, Breeding and Feeding .....	<u>9</u>	
Total .....	57	<u>27</u>
<u>Analyzing Cost of Production and Economic Efficiency</u>		
Measuring Efficiency Practices .....	6	
Farm Labor, Migration, Immigration, Rehabilitation ...	6	
Types of Farming and the Subsistence Plan .....	3	
Tax Delinquency and Utilization .....	<u>4</u>	
Total .....	19	<u>11</u>
<u>Testing Farm Home Conveniences and Management</u>		
Improving Farm Homes and Household Efficiency .....	3	3
<u>Conserving Soil Fertility and Testing Irrigation</u>		
Maintaining Fertility and Preventing Erosion .....	9	
Effect of Fertilizers on Yield, Quality and Income ...	6	
Appraisal of Soil and Plant Food Resources .....	4	
Economic Irrigation and Drainage .....	<u>15</u>	
Total .....	34	<u>22</u>
GRAND TOTALS .....	<u>237</u>	<u>142</u>

# \$ 10,000,000 IN DIVIDENDS FROM AN INVESTMENT OF LESS THAN \$ 100,000



RETURNS TO THE STATE

No one can place an exact money value on the continuous returns the people of Oregon receive from the results of agricultural research. Careful and conservative estimates of known results, however, easily exceed \$10,000,000 annually. Oregon's direct cash contribution to this research program is less than 1% of this return.

\$ 96,069.94



COST TO THE STATE

## REPRESENTATIVE ACHIEVEMENTS OF THE EXPERIMENT STATIONS

Reducing the hazards of farming and improving the standards of living in rural homes are the major objectives of the research of the Oregon Agricultural Experiment station, composed of the central station and 10 branches throughout the state. Through its scientific investigations the experiment station has discovered facts and principles worth 10 million dollars annually to Oregon agriculture and related industries, to say nothing of the values to human welfare generally, results of which cannot reasonably be estimated on an economic basis.

Research has been the farmers' most effective ally in combatting the forces that destroy his crops and his livestock. It has done much to safeguard his industry and has brought him an increasing degree of security.

Old Crop Varieties Replaced. Today but few of the original varieties of crops produced in Oregon still remain. Most of them have been replaced by superior strains bred or developed by the experiment station and introduced to the farmers through the extension service.

A Two Million Dollar Seed Industry Developed. Oregon has become a principal source of seed supplies through the introduction of such crops as winter field peas, vetches, clovers, and numerous grasses.

Commercial Fruit Industry Protected. Constant vigilance against existing and new diseases and pests, plus the development of practical methods for removal of spray residue has permitted the survival of Oregon's tree fruit industry. Development of blight resistant pear stock has drawn international acclaim.

Quality Improved to Win Markets. Oregon producers must in many instances compete with those nearer the central markets, hence must depend partly on superior quality. Research has aided them by such methods as improved storage and ripening processes with fruit, chemically treated fruit wrappers to avoid decay, improved dehydrating principles which enhance quality, and a method of brining cherries on a large scale for maraschino purposes.



Fiber flax, grown on the experiment station farm where federal and state cooperative research is aiding in the establishment and progress of this industry.



Experimental flock of turkeys used in developing a method of raising birds on high protein feeds which has been widely adopted throughout the state.

Livestock Diseases Solved. The research work of the department of veterinary medicine is credited with having worked out practical control measures for such major livestock maladies as Bangs disease, liver fluke of sheep, and more recently lamb and calf dysentery. In the poultry disease field the department originated the present standard method for control of fowl pox and coccidiosis.

Fruit Pollination Studied. Experimental work by the station revealed some years ago the fact that failure of sweet cherries to bear well commercially was due to lack of proper pollination. Similar work is now being conducted with pears and other fruits.

Soil Resources Appraised. Through soil surveys conducted cooperatively with federal agencies, chief agricultural regions of the state have had their soil surveyed, classified and mapped, giving a permanent basis for future management practices.

Poultry Industry Fostered. Through originating the method of breeding for higher production, marked by the raising of the first 300-egg hen ever known, the station launched the state on its present commercial egg industry and has ever since cooperated in keeping growers abreast of modern competitive demands.

Profitable Irrigation Developed. For nearly 20 years before irrigation was generally practiced in western Oregon, the experiment station was gathering facts as to its practicability. Within the last half dozen years through cooperation with the extension service these facts have been applied on such a scale that irrigation is now a major practice west of the mountains. Irrigation studies for use in the semi-arid regions have been equally successful as carried on at the branch stations.

Virus Diseases Attacked. Virus diseases of garden, field, berry and tree crops have been and continue to be among the most baffling and serious. Oregon scientists have made notable strides in their solution with potatoes, strawberries, cane fruits and others, but much remains to be done.

COST OF RESEARCH TO OREGON TAXPAYERS REMARKABLY LOW

Contrasted with the significant returns of agricultural research to the state, is the small cost of this service to the Oregon taxpayer. Figured in comparison with total property tax levies, agricultural research costs the state only 23¢ for every \$100 in general property taxes paid. This does not mean that even this small cost is paid entirely by the property taxpayer, as to the extent that state property levies are eliminated the funds come from other tax sources.

The following table shows the allocation of state funds (mileage and state appropriations combined) used for agricultural research in Oregon during the last year of the biennium (1935-36) distributed according to the investigations of the major farm enterprises.

ALLOCATION OF STATE FUNDS FOR AGRICULTURAL RESEARCH AT THE CENTRAL EXPERIMENT STATION AND AT THE TEN BRANCH STATIONS FISCAL YEAR 1935-36

Farm Enterprise	Average annual cash income to farmers from enterprises listed (1930-34)*	Total State funds budgeted for agricultural research (1935-36)	Cost of Research for each \$100 general property tax paid**
Field Crops	\$22,218,000	\$35,233.63	0.087
Horticultural products	20,998,000	33,866.02	0.084
Livestock (Beef, hogs, sheep, dairy, wool, mohair)	24,388,000	11,943.10	0.029
Poultry and eggs	5,503,000	9,464.79	0.023
Dairy products	19,453,000	5,562.40	0.014
Totals	\$92,560,000#	\$96,069.94	0.237

\* Based on Bureau of Agricultural Economics, Crop Reporting Board, "Farm Value, Gross Income and Cash Income from Farm Production."

\*\* Based on general property tax levied on the rolls of 1935 for the year 1936 as reported by the State Tax Commission and using funds budgeted for 1935-36. (Total tax levy \$40,542,871.80.)

# This average cash farm income covers only the depression years and is smaller than totals for 1929 and before, and for 1935 and 1936. The total for 1929 including value added by manufacture, is estimated at \$163,600,000.

FEDERAL AND STATE COOPERATIVE PLAN REDUCES  
COST TO OREGON CITIZENS

By contributing one dollar to agricultural research, Oregon taxpayers obtain the benefits of three additional dollars from other sources. More than half of the total amount used is from federal sources subject to withdrawal should the state fail to meet its share of the financial and cooperative responsibilities in the constructive research program devoted to the solution of Oregon's perplexing farm problems.

Other state agencies, such as the state game commission, and some private or semi-public institutions find it to their advantage to contribute varying amounts for the support of research on specific problems to be carried out under the experiment station organization. In all such cases results are made available for the general public.



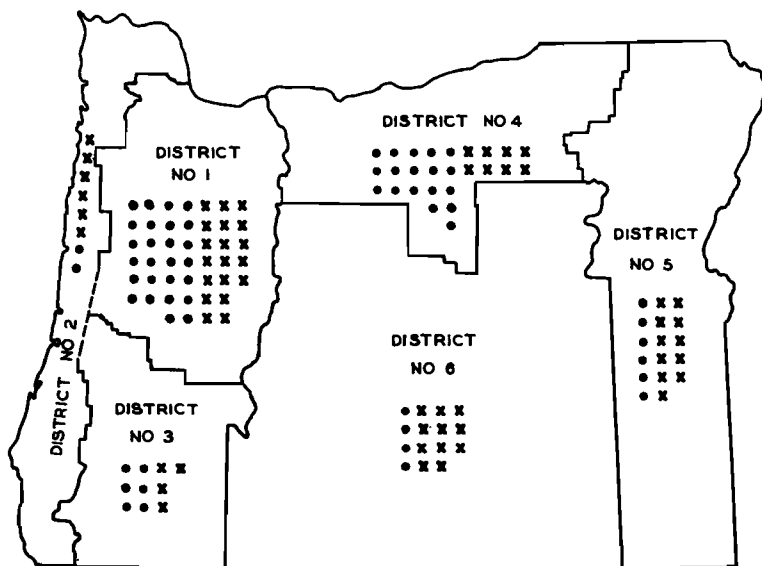
This carload of prime baby beeves were fattened at a branch station as part of experiments toward increasing the profits of Oregon's livestock industry.

MANY NEW INVESTIGATIONS REQUESTED

Demand for new investigations are ever on the increase, as is indicated by the table on page 2. The problems of agriculture increase as agricultural development progresses and as society becomes more complex. The problems related to Oregon's awakened interest in wild life conservation and development are recent examples, but the older established enterprises are also confronted with new problems constantly. During the biennium requests for the investigation of 142 new problems were received. Most of these had to be postponed indefinitely because limited funds available were all being used on other projects.

## OREGON CASH FARM INCOME BY TYPE OF FARMING DISTRICTS

Each dot (.) represents \$1,000,000 from crop products.  
Each cross (x) represents \$1,000,000 from animal products.



The map above indicates the extreme diversity of Oregon's agriculture. Even the six major districts fail to represent fully the variation in climate and soil which at once make Oregon a distinctive farming state and add tremendously to agricultural research problems.

The central experiment station at Corvallis serves District No. 1 and in some respects the entire state, but without the branch stations listed on the opposite page Oregon's agriculture would be but poorly served. Each region differs from the others in major agricultural characteristics, and within the single Columbia Basin district (No. 4) there are such varying farming regions as the Hood River orchard district, the Umatilla irrigation project, and the dry-land grain regions.

Rainfall at the branch stations varies from an annual average of 7.78 inches at Burns to 77 inches at Astoria, and average length of growing seasons from 63 days to 282 days at the two extremes.



TEN BRANCH STATIONS ARE DEVOTED TO THE STUDY  
OF OREGON'S VARIED REGIONAL PROBLEMS

John Jacob Astor Experiment Station, Astoria

To investigate problems peculiar to the coast region, including forage and root crop production, dairy management, "cut-over" timber land and development of new cash crops adapted to the coast.

Established ..... 1913  
Elevation ..... 175 feet  
Average Annual Rainfall .... 77 inches  
Average Growing Season ..... 282 days  
Lowest Winter Temperature .. +10° F.

Harney Branch Experiment Station, Burns

To test crops and farming methods adapted to high altitudes and short growing seasons, and to experiment with the handling and wintering of range livestock, serving as a "home ranch."

Established ..... 1911  
Elevation ..... 4150 feet  
Average Annual Rainfall .... 7.78 inches  
Average Growing Season ..... 63 days  
Lowest Winter Temperature .. -45° F.

Squaw Butte Range Station, Burns

Located 50 miles west of Burns, this station of 16,000 acres of range land, is to study range forage improvement, grazing, breeding and management problems for both cattle and sheep.

Established ..... 1935  
Elevation ..... 4500 feet  
Average Annual Rainfall .... 7.78 inches  
Average Growing Season ..... 63 days  
Lowest Winter Temperature .. -45° F.

Umatilla Branch Experiment Station, Hermiston

To conduct investigations in irrigation practices on sandy soils for developing cropping methods suited to that type of agriculture; dairy management and turkey feeding experiments.

Established ..... 1909  
Elevation ..... 451 feet  
Average Annual Rainfall .... 8.4 inches  
Average Growing Season ..... 183 days  
Lowest Winter Temperature .. -36° F.

Hood River Branch Experiment Station, Hood River

To investigate problems of fruit production under Hood River conditions, particularly disease and insect control, hardiness, pollination, varietal testing, fertilizing, soil management, irrigation.

Established ..... 1912  
Elevation ..... 300 feet  
Average Annual Rainfall .... 32 inches  
Average Growing Season ..... 184 days  
Lowest Winter Temperature .. -27° F.

Medford Branch Experiment Station, Medford

To study the problems affecting irrigation and drainage and soil fertility in the Rogue River valley, and the relation of these and other problems to commercial orchard management.

Established ..... 1931  
Elevation ..... 1456 feet  
Average Annual Rainfall .... 18.08 inches  
Average Growing Season ..... 154 days  
Lowest Winter Temperature .. -10° F.

Sherman Branch Experiment Station, Moro

To study problems in cereal production under eastern Oregon dry land conditions, including new varieties, seeding and tillage practices, soil conservation, and forage grass development.

Established ..... 1909  
Elevation ..... 1838 feet  
Average Annual Rainfall .... 11 inches  
Average Growing Season ..... 150 days  
Lowest Winter Temperature .. -22° F.

Pendleton Branch Experiment Station, Pendleton

To investigate methods of establishing crop rotations on lands which have grown wheat exclusively; tillage and fertility problems, grass and tree nurseries under higher rainfall.

Established ..... 1927  
Elevation ..... 1440 feet  
Average Annual Rainfall .... 13 inches  
Average Growing Season ..... 149 days  
Lowest Winter Temperature .. -28° F.

Southern Oregon Branch Station, Talent

To develop improved methods for the region in disease and insect control, pollination, harvesting and storage for fruit; general farming problems, varietal testing and breeding.

Established ..... 1911  
Elevation ..... 1550 feet  
Average Annual Rainfall .... 16.42 inches  
Average Growing Season ..... 165 days  
Lowest Winter Temperature .. -9.7° F.

Eastern Oregon Livestock Station, Union

To investigate problems of beef and sheep production, feeding and management under farm and range conditions; cereal and other crop studies, fertilizers and practices for the Blue Mountain area.

Established ..... 1901  
Elevation ..... 2787 feet  
Average Annual Rainfall .... 13 inches  
Average Growing Season ..... 118 days  
Lowest Winter Temperature .. -24° F.

### TECHNICAL ADVISORY SERVICE HELPFUL

In addition to conducting a regular organized research program, the Experiment Station serves as a clinic in identifying numerous plant, animal, disease, insect, and other specimens, and in answering thousands of requests for technical information of which the following are typical examples:

- (1) 30,580 specimens of disease, seed, milk, water, and butter were tested.
- (2) 4,956 specimens were given chemical and bacteriological analyses.
- (3) 31,000 personal consultations were held with farmers seeking technical assistance.
- (4) 71,000 letters were written in response to requests for technical help.



Farmers visiting one of the branch stations on a field day, sponsored jointly with the extension service. Growers watch closely the annual progress made.

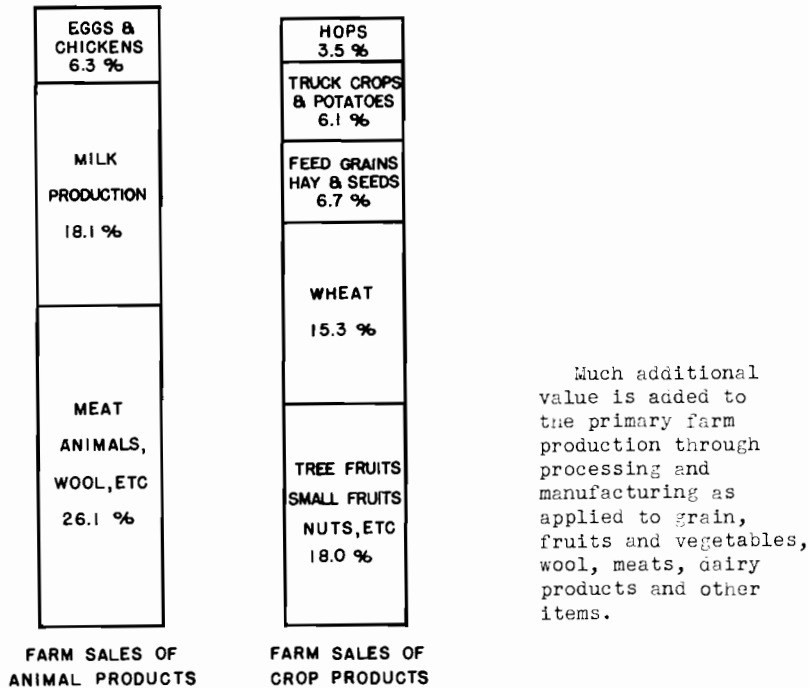
### STATION PUBLICATIONS IN DEMAND BY FARMERS

A total of 99 publications comprising in all more than 4,000,000 pages of information, were published during the biennium. These have a wide distribution among the 65,000 farmers of the state to whom they are supplied free. Out-of-state demand has also developed, but because of limited funds available a nominal charge covering the actual cost is made for those sent to other states.

Many of the more technical findings of the station's research workers not considered suitable for separate bulletin use, are in demand as articles for publication in the nation's scientific journals. Twenty such were published in the past two years.

## PRINCIPAL SOURCES OF OREGON AGRICULTURAL INCOME

Crop and animal production on Oregon farms account for approximately 75 percent of the value of the state's primary production. This does not take into account the values added by processing or manufacturing, either as applied to products of the farm or other basic industries. The welfare of an industry yielding three-fourths of the state's primary production is vital to all citizens.\*



\*Figures and chart from "Agricultural Income in Oregon," by L. R. Breithaupt.