

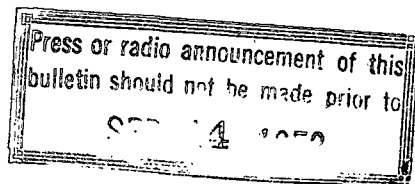
# SPECIALTY CROPS

An Appraisal of the Problems and  
a Statement of Recommendations

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One of 12 committee reports prepared by representative producers in cooperation with staff members of Oregon State College and other agencies. Adopted at the statewide agricultural conference March 27-29, 1952.

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Oregon State College  
Corvallis

## Foreword

A State Agricultural Conference was held at Oregon State College on March 27, 28, and 29, 1952, at which reports of 12 major committees were discussed and approved at public forum sessions. This publication contains the report of one of those 12 committees. Reports of the 12 committees are to be issued in the following publications:

Agricultural Relations .....	Oregon Agriculture 10
Dairy .....	Oregon Agriculture 11
Farm Crops .....	Oregon Agriculture 12
Farm Forestry .....	Oregon Agriculture 13
Fur Farming .....	Oregon Agriculture 14
Horticulture .....	Oregon Agriculture 15
Land Economics .....	Oregon Agriculture 16
Livestock .....	Oregon Agriculture 17
Poultry .....	Oregon Agriculture 18
Rural Life .....	Oregon Agriculture 19
Soil and Water Resources .....	Oregon Agriculture 20
Specialty Crops .....	Oregon Agriculture 21

The purpose of this state-wide conference was to take stock of the present situation in the agriculture and rural life of the state and to indicate probable trends and desirable developments over a period of years ahead. Members of the 12 committees were private citizens who were invited by the Extension Service to participate in this activity and who willingly donated their time and paid their own expenses to take part in a series of committee meetings during the year preceding the conference. It is felt that these reports contain the considered judgment of a representative group of citizens who carefully studied available facts in arriving at the recommendations presented. They are being published by Oregon State College as a public service for use by individuals and groups who may wish to consider these facts in planning their own future activities.

Statistical data have been checked by Extension Specialists in Agricultural Economics Information and are based on the most recent available reports of the U. S. Department of Agriculture, U. S. Department of Commerce and other sources deemed reliable.

F. L. BALLARD  
Associate Director

## Summary

A committee of about 50 Oregon specialty crops producers worked for more than a year in preparing this report on specialty crops. Some of the most outstanding developments in Oregon's agriculture have occurred in the field of specialty crops. Twenty-five years ago most of these crops were either unknown in Oregon or were of small importance.

The canned vegetable pack has increased from 400,000 cases in 1925 to 8,000,000 cases in 1950. In the last 15 years the frozen vegetable industry has grown to about 60,000,000 pounds annually and is worth \$11,000,000 to the producers of these crops.

Less than 10,000 acres of our crop land was devoted to vegetable production 25 years ago, while today we use over 90,000 acres for this purpose.

Oregon's nursery industry has made a changing but steady growth due to our favorable soils and climate. We are producing high quality nursery stock on about 2,500 acres of our best soil. This business has changed from one of fruit-tree production primarily to one heavy in ornamental stocks. The 1949 survey showed the producer income from nursery stocks to be over three and one-third million dollars.

Greenhouse-producer income was over three million dollars in 1949 and is steadily growing to provide for our rapidly increasing population. Only a small part of our people buy flowers for inside home decoration. This offers a challenge to our producers to try for this business.

In 1949 the Oregon bulb business had developed into a 2,350-acre production with a farm income of over three million dollars. Most of this growth has taken place during the past 25 years. Gladioli, narcissuses, and lilies lead in production. Importations from Japan and Holland are competing with some of our bulb crops. We must raise a high quality crop and keep our costs down in order to meet this competition.

The mint growing areas of the Northwest continue to move as they have in the East and Midwest. When diseases attack the crop and fertility declines, the grower moves to other desirable locations. Oregon now has nearly 15,000 acres devoted to mint growing. There is some shift now from the lower Columbia River area to eastern Oregon and Washington. The western Oregon oils have been accepted on almost as high a standard as the Michigan-Indiana oils. The newer areas are producing larger yields but this oil has a "harsh" or "strong" characteristic flavor which causes it to bring a lower price.

All specialty crops are suffering from the ever-increasing transportation costs. Our growers want to know more about soil management, fertility, irrigation, and crop rotations. Research on labor-saving machinery and its adoption by the producers is a necessity if we are to continue to grow and prosper in this field of intensive agriculture.

# Bulbs

## Subcommittee Report

### Bulbous Iris

Bulbous irises were little known to Americans before 1925. Limited amounts were imported from the Netherlands, for propagation, and the supply and demand grew slowly. About 1930, as the value of the flowers was realized, the demand grew rapidly with markets absorbing all the bulbs produced.

During World War II, when no bulbs were imported, the demand was very heavy on Northwest growers. At the close of the war, when all restrictions were lifted, the foreign distributors offered their bulbs to the American florist at far below our prices. The American market has continued to use all Northwest bulbs almost every year at a price considerably above that of the Dutch bulbs, but some items have been reduced in price.

The present trend is to raise larger bulbs and the more desirable varieties with less small and common stocks.

The Northwest bulbs are harvested earlier than the competitive foreign stocks and produce much earlier flowers.

Storage of bulbs at high temperatures aids in producing earlier flowers.

The foreign competition may bring about lower prices. With lower prices we must reduce our costs.

A minimum unit is one that will justify the purchase and maintenance of equipment with which to grow and handle bulbs. This will include field machinery, graders, storage and treating equipment. Irises must be stored at a controlled high temperature.

Considering this costly equipment it would seem inadvisable for anyone to try to produce bulbs on small acreages as a part-time project. Ten to twenty acres are considered a minimum acreage.

Irrigation is necessary in some areas in order to maintain the moisture necessary for production of a good crop.

While bulbs can be produced on various types of soils the re-use of land becomes a problem. Some diseases build up or remain in the soil for several years.

### Recommendations

- Grow only that for which you have a market.

- Avoid growing surpluses.

- Mechanize operations as much as possible.

- Continue development of chemical weed control.

Adhere to uniform prices in Oregon and Washington.

No increase in acreage—a slight reduction with better yields of high quality should be the aim.

Maintain a foundation block for production of the best planting stock.

Deliver only stock that will perform well and increase demand.

More research is needed in the field of soil-borne diseases.

Support grower associations for greater strength when needed.

Consistent effort should be made towards having controls placed on bulb imports.

Do everything possible to popularize Northwest-grown bulbs with the florist and the public.

## **Lily Bulbs**

Easter lily bulbs had been raised in Oregon to a very limited extent until the outbreak of World War II. In 1940 some 26 million bulbs were imported from Japan for use by the American florists. With the outbreak of the war imports dropped off, and our growers started an intensive program to increase the few bulbs that were available.

In 1940 we raised about 90 acres of all lilies, and by 1945 we had increased production to an estimated 605 acres and were still growing more bulbs. The crop was estimated to be worth \$2,000,000 in 1945.

Oregon Easter lily acreage has now remained at approximately 350 acres for three years. The Regal lily acreage has decreased about half in recent years, but the other garden lilies have become quite popular and acreage is on the increase.

There is a need by Easter lily growers for a survey each year to show acreage and size of the stock planted and its condition in early spring. This would place the grower in a better position to meet the buyers and should aid in stabilizing the industry.

Easter lily bulb production in the South and East as well as Japan has not proved to be entirely satisfactory judging from the results obtained by the forcers of this stock. Virus has run quite high and quality poor.

Oregon lily bulbs forced in Oregon in 1951 were far superior to those from other areas. Nematodes were very scarce, and bud blast was confined to a few growers. Scorch was damaging in a few places. This was probably due to forcing conditions rather than to the bulbs used.

Western Oregon conditions are particularly adapted to lily bulb production. The newly irrigated areas are not adapted to this

crop and should offer no competition. Other plants definitely compete with the lily. A good product, at a fair price and properly advertised, should overcome this situation.

The Committee feels that lily bulb production is a poor crop for the part-time operator. It requires high quality soil, considerable standard equipment as well as special treating, planting, digging, and grading equipment. If one does not have the necessary tools and equipment he cannot raise the high quality product desired by the buyers and will, therefore, lose money and time in most cases.

An economic unit was discussed for Easter lily bulb production. It was agreed that such a minimum unit would be 12 to 15 acres. This would raise about 2 acres of bulbs or 25 to 30 thousand commercials each year, raise the planting stock, and allow for proper rotation and maintenance of the soil. The desired land is high-priced, of high quality, the taxes are high, and competition is keen from other crops. Such land is necessary to produce the lily bulbs desired by the American florist.

Irrigation is needed for lily bulb production since the bulbs make their growth in the summer months. The soil must be well supplied with organic matter, be well drained and easy to work. The bulbs are planted in the late fall and the soil remains wet all winter. Late October seems to be the best planting time, and the bulbs should be covered with soil to a depth of three times their diameter.

Easter lily plants seem to require a growing medium with a pH of 6.0 to 7.0, and a uniform, complete fertility for best growth. Cover crops are desirable to produce and maintain the organic matter content of the soil. Vetch and oats are one of the best ways to give a good crop. If vetch will not grow well you can add ammonium sulfate at the time the other crop is turned under and get the same results. Grow a heavy crop of whatever will grow on your soil.

Chemical weed controls are useful in killing weeds and in turn keep the grower off the land when it is wet in early spring. This is a critical time for both soil and plants. Sprays being used with apparent satisfaction are (1) Shell 20 and (2) stove oil, 20 gallons plus 1 quart of Dow General per acre. These are pre-emergence sprays and are put on before the crop shows above the ground. The recommended spray is I.P.C., 6 pounds plus Dow General, 1 quart plus 10 gallons diesel oil plus 30 gallons water before lilies show above ground. There is need for more research on selective sprays for lilies.

The production of good foundation stock is recommended as a necessity for the continuation of the lily industry. A certification program for Easter lily bulbs is a possible necessity.

Labor-saving machinery such as planters, diggers, and graders are desirable in cutting down costs and are considered a necessity in present-day cultures. The time element is very important with this crop because there is so much to be done in a very short period of time.

It is recommended that the research be continued on insect and disease problems. Much work has been done but there are still problems to be solved.

More research is needed on complete fertilizers and the general culture of lily bulbs. New and better varieties will help this industry.

It is recommended that the Producers Protective Law of California be further investigated and, if found desirable, to assist in bringing before the Legislature plans for a similar law to care for the needs of Oregon growers. The Pacific Bulb Growers Association is recommending this law to the Oregon Legislature and has set up a committee to present it and recommend that Oregon agriculture get behind the movement. Sample sales contracts are available from existing marketing organizations for use by lily growers.

The supply of lily bulbs is sufficient for present needs. A higher quality will improve the public relations and increase the use of bulbs. The Committee recommends that more research be done so that correct forcing information will be available to lily bulb forcers and can be included with each shipment, if desired.

It is recommended that research be continued dealing with moisture and temperature in storage.

Lily bulb growers should give closer attention to their roguing program in order that virus counts will be kept down.

Shipping-point inspection of lily bulbs is to be made available next year. Growers should give this some consideration since one loss will more than offset years of inspection costs.

It is recommended that each grower become affiliated with an educational association.

## **Narcissus and Tulip Bulbs**

Narcissus bulb growing has made a gradual and steady growth in Oregon during the past 25 years. In 1936 plantings totaled 400 acres, and in 1949 it had increased to 750 acres. The income per acre from narcissus bulb sales increased from \$560 in 1936 to a high of nearly \$1,000 in 1945. In 1949, income per acre was approximately \$580. Cut flowers from the bulb acreage supplement the income of many growers.



The tulip industry which never was large grew to over 100 acres for a few years and now has settled down to around half that amount. The future of this type of bulb will depend on several things:

- Increased bulb usage is associated with good times. A European recovery should open up markets for Holland bulbs and improve our marketing.
- Any restriction placed on imports would help our marketing.
- Oregon bulb growers need better freight rates. Holland bulbs can travel from New York to Oregon cheaper than our bulbs travel to New York markets. Federal tax rates add to our cost while Holland ships to the U. S. without this added cost.

## Gladioli

Gladiolus bulbs first came into prominence in Oregon as a commercial flower about 1918. Plantings were small with Oregon's entire acreage being about 15 acres. Gladioli are now grown in every state, and they rate next to roses and chrysanthemums in popularity.

In 1926 increased acreages were grown at Grants Pass, and by 1936 there were 250 acres in Josephine and Jackson counties and 200 acres throughout the rest of Oregon. Bulbs were sold nearly every year, but sometimes the prices were very low, especially in 1930-34.

Growers now find themselves squeezed between the higher costs of production and lower prices paid for the bulbs. Many people are overcoming this difficulty by the use of labor-saving machinery such as the automatic grader which grades six sizes at once.

Harvesting machinery is now in the experimental stage of production. A machine that digs, tops, and shakes out the dirt has been made in Michigan. This should save over \$300 per acre. A machine is nearing completion here in Oregon that will handle the harvest of the larger bulbs.

### Recommendations

The perfection of labor-saving machinery and a continuation of the disease control program.

## Miscellaneous Bulbs

Rhizome irises were imported exclusively from France and England until about 1921. American hybridizers then introduced a few varieties, but importations continued strongly until 1930. Then the American varieties took over and now over 1,000 American hybridizers are working on this plant and supplying our markets.

All bulb crops require much hand labor from the time of spring hoeing until the crop is harvested and marketed. The miscellaneous bulbs are sold direct to a large extent and good, cumulative advertising brings the results desired.

Equipment includes a tractor with attachments, possibly a small tractor, sprayers or dusters, hand tools, and a packing shed.

Five acres are considered a minimum-sized operation for a family, and then some outside help will be needed during rush periods.

Most of this type of plant life is shipped in ventilated cartons with most of the small packages going parcel post. Careful handling and quick movement are essential to success.

Several specialty items can be handled by the same firm if heavy labor demands do not overlap too much. The same equipment can be used for most of these crops.

Weeding is a costly job, and improved weed control measures are desired.

## **Suggestions for Improving Northwest Bulb Industry**

### **Develop markets close to producer.**

European markets are better suited to Dutch than to the U. S. bulb trade. However, California markets now being supplied at least in part by Dutch bulbs could more favorably be supplied by Northwest growers. Smaller bulbs, for which it is difficult to find a market in the forcing trade, grow and force well in California. Favorable markets for these smaller bulbs would be a means of marketing smaller bulbs not used in the forcing trade. Certainly consumers' needs should be supplied as well as is possible without substitution.

### **Stress quality of local bulbs.**

Quality of Northwest-grown bulbs can be maintained and increased to a higher degree of perfection. Present advantages of Northwest forcing bulbs over Holland bulbs are quality, size, earlier and higher quality forcing, and more uniformity of flower color. Every opportunity should be made to call these factors to the attention of consumers.

### **Maintain foundation stock.**

Foundation plantings can be maintained to insure an adequate supply of high quality planting stock for Northwest bulb growers. Overlooking foundation stock as a continued source of planting could cause a definite setback in the Northwest bulb industry.

**Watch the effect of certification.**

Certification of narcissus bulbs was started last year in Oregon with only a few growers applying for it. Eventually bulb forcers will learn that certified stock is more dependable than ordinary stock. Favorable comments have already been made on the high quality of Washington certified narcissus bulbs. It seems very likely that there will be a growing demand for certified bulbs.

**Know what to plant.**

Standard varieties that the consumer wants will sell best. Novelties require a special type of outlet, and this should be arranged for in advance of production.

Hybridizers should know what is wanted and work towards that end with a thorough understanding of their work.

**Cut down labor costs.**

Improvement of labor-saving machinery needed. Machines for planting, digging, and grading can and should be further improved. Field testing is very desirable.

Fumigation and dipping methods can be improved. The purpose of each operation should be kept in mind.

**Land and equipment needed.**

Bulbs require good, well-drained soil and enough land to give a proper rotation of about 3 years.

Planting, digging, and grading machinery is necessary. A fumigation chamber and dipping vats are needed for narcissus culture.

A storage and handling warehouse should be part of every bulb grower's equipment.

**Research needed.**

Chemical analysis of the bulbs and how to supply these elements for proper growth would be helpful.

Work on viruses, fungi, nematodes, and bulb flies and their control is needed.

The storage and handling of bulbs should have additional study.

Forcing following storage and controlled lighting might bring out interesting and helpful facts.

**Selling the crops.**

Belonging to an organization helps educationally and gives strength to the selling program.

Every effort to make the bulbs attractive to the consumer will help in the retail selling of our product.

# Mint

## Subcommittee Report

### The Past

**Mint acreage shifts have been to the areas of highest yields.**

The history of mint production in the United States sets a pattern of acreage shifts from one area to another. These shifts and the reasons for them are considered very significant.

Mint was first introduced into the United States in Massachusetts about 1800-1805. By 1825 several hundred acres were in production there.

About 1816 the crop became established in New York state and from there its culture spread westward to Ohio and later to southern Michigan and northern Indiana.

The muck soils of the Michigan-Indiana area were found so well adapted to mint production that this area soon became the center of U. S. mint production. Plantings in Massachusetts and New York gradually reduced and today these areas have no commercial plantings.

In 1910 mint was introduced into Oregon and developed into the present industry in the Willamette Valley and the lower Columbia River area.

In recent years the crop has become established in the irrigated areas around Yakima and Kennewick in eastern Washington. There is also a small acreage in the Sacramento delta area of California.

In the past two years, commercial plantings have been established in the irrigated lands of Malheur County in eastern Oregon.

Within the past five years the increasing mint acreage in Oregon and Washington has been accompanied by a decreasing acreage in the Michigan-Indiana area.

Even more recent is a slight decline in acreage in the lower Columbia River area in Oregon and Washington while the Willamette Valley and eastern Washington acreage has been increasing.

Reasons for shifting acreage in the early history of the U. S. mint production are not entirely clear, but apparently the shift from Massachusetts to New York to Ohio and finally to the muck soil areas of Michigan-Indiana were due mainly to better yields and cultural conditions found in the new areas.

The more recent decline in the Michigan-Indiana area has been due primarily to lowered yields caused mainly by disease, particularly verticillium wilt.

For a short time, yields in the lower Columbia River area exceeded those in the Willamette Valley and were the highest in the United States. Rust, root rot, and declining fertility reduced yields by 50 per cent in the lower Columbia River area during the past two harvest seasons. During this time eastern Washington production became firmly established and the average of yields obtained there the last two years probably exceed those ever obtained by any area in the United States.

During the past two years some mint producers from the lower Columbia River area have established themselves in mint production in eastern Washington and Oregon.

The most recent major development reported in shifting mint acreage has been the planting of an estimated 2,000 to 3,000 acres in Wisconsin. While United States Department of Agriculture reports do not list any acreage in Wisconsin, the mint industry representatives indicate substantial plantings.

It is of interest that the majority of this acreage is credited to mint growers from Indiana and may be reported in Indiana acreage figures. These growers are trying new areas in an effort to get away from the verticillium wilt which has caused so much trouble in the Michigan-Indiana area.

Mint roots used to plant the Wisconsin area were given special hot water treatment to kill all wilt infection.

### Importance of quality

Quality in oil has always been emphasized as extremely important by the consuming trade. Sharp comparisons have been made by the trade in the quality of oil between one district and another.

Without any definite standard for mint oil, except for poor quality caused by such factors as weeds, poor distillation practices, or poor storage, high quality oil can be defined only as that from areas from which the trade would prefer to buy. Just what part quality played in the shifts of acreage in early history is not known. However, after the Michigan-Indiana area became established in production and almost all of the oil used came from that area, its oil became a standard of top quality.

First mint production in the Oregon-Washington area found its oil discriminated against through lower prices offered. While its quality could not be called inferior it was *different* from that of oil to which the trade was accustomed.

In more recent years as the western Oregon-Washington oil became the leading source, the quality of its oil has been accepted as almost equal to Michigan-Indiana oil.

Table 1. TRENDS IN ACREAGE, YIELD, AND PRICE OF MINT, BY AREA.

Crop and state	Area planted			Mint oil per acre			Price per pound		
	Average 1940-49	1950	1951p	Average 1940-49	1950	1951p	Average 1940-49	1950	1951p
<i>Peppermint</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>			
Indiana .....	15,770	15,400	12,500	28.8	26.0	32.0	\$5.42	\$5.25	\$7.00
Michigan .....	13,840	10,000	10,000	22.6	22.0	20.0	5.36	5.65	6.95
Ohio .....	90	.....	.....	34.3	.....	.....	4.87	.....	.....
California .....	510	.....	.....	34.8	.....	.....	4.84	.....	.....
Oregon .....	7,440	14,600	14,600	43.4	45.0	38.0	5.47	5.35	6.60
Washington .....	3,560	5,100	6,800	46.7	60.0	65.0	4.92	5.05	5.95
Total .....	41,210	45,100	43,900	31.1	35.1	36.4	\$5.34	\$5.31	\$6.57
<i>Spearmint</i>									
Indiana .....	7,600	9,700	7,600	33.1	31.0	34.0	\$3.62	\$3.60	\$5.00
Michigan .....	3,320	5,200	4,700	33.9	34.0	31.0	3.60	3.80	5.10
California .....	60	.....	.....	43.6	.....	.....	2.88	.....	.....
Total .....	10,980	14,900	12,300	33.3	32.1	32.8	\$3.62	\$3.68	\$5.04

p Preliminary.

Today mint oil from eastern Washington is termed inferior by the trade because of "harsh" or "strong" characteristics of much of the oil produced there.

Table 1 sets forth briefly the most recent trends in acreage, yield and price of mint in the various producing areas of the United States.

Over the years approximately 75 per cent of the total mint oil is consumed in the United States and 25 per cent is exported.

Table 2 lists the Oregon and U. S. production and the amounts used for U. S. consumption and for export.

In the past seven years there has been a variation from the average 25 per cent export that is significant. During these seven years U. S. consumption was high. In addition, approximately one-fourth of the oil produced was exported. Over these seven years these have materially increased U. S. mint acreage.

Table 2. MINT OIL PRODUCTION AND EXPORTS, 1935-1951.

Year	Production		U. S. exports, year beginning Sept. 1 <sup>2</sup>	Remainder for U. S. consumption and carry- over <sup>2</sup>
	Oregon <sup>1</sup>	U.S. <sup>2</sup>		
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
1935 .....	60,000	1,368,000	466,429	901,571
1936 .....	88,000	1,067,000	370,298	696,702
1937 .....	84,000	1,012,000	401,696	610,304
1938 .....	83,000	1,064,000	377,628	686,372
1939 .....	105,000	1,009,000	445,849	563,151
1935-1939 average ....	84,000	1,104,000	412,380	691,620
1940 .....	109,000	1,142,000	288,608	853,392
1941 .....	133,000	1,197,000	254,544	942,456
1942 .....	162,000	1,784,000	316,565	1,467,435
1943 .....	133,000	1,065,000	261,657	803,343
1944 .....	300,000	1,412,000	325,907	1,086,093
1940-1944 average ....	167,400	1,320,000	289,456	1,030,544
1945 .....	328,000	1,705,000	377,343	1,327,657
1946 .....	396,000	1,641,000	497,499	1,143,501
1947 .....	550,000	2,084,000	338,853	1,745,147
1948 .....	567,000	2,369,000	568,691	1,800,309
1949 .....	609,000	2,168,000	617,349	1,550,651
1945-1949 average ....	490,000	1,993,400	479,947	1,513,453
1950 .....	657,000	2,061,000	562,000	1,499,000
1951 <sup>3</sup> .....	555,000	2,001,000	.....	.....

<sup>1</sup>Peppermint only.

<sup>2</sup>Peppermint and spearmint.

<sup>3</sup>Preliminary.

Source: Production—Bureau of Agricultural Economics, U. S. Department of Agriculture. Exports—Bureau of the Census, U. S. Department of Commerce.

## The Present

### Areas of production

Today mint oil production is divided almost equally between the Michigan-Indiana area and the Oregon-Washington area. Table 3 gives 1951 preliminary estimates of the industry in the various growing areas.

Table 3. MINT OIL: 1951 PRELIMINARY.

Crop and state	Area planted	Production	Price per pound	Value
	<i>Acres</i>	<i>Pounds</i>		
<i>Peppermint</i>				
Indiana .....	12,500	400,000	\$7.00	\$ 2,800,000
Michigan .....	10,000	200,000	6.95	1,390,000
Oregon .....	14,600	555,000	6.60	3,663,000
Washington .....	6,800	442,000	5.95	2,630,000
Total .....	43,900	1,597,000	6.57	10,483,000
<i>Spearmint</i>				
Indiana .....	7,600	258,000	5.00	1,290,000
Michigan .....	4,700	146,000	5.10	745,000
Total .....	12,300	404,000	5.04	2,035,000

### Use of oil

The domestic demand for mint oil is still high due to the large purchasing power of the U. S. public. The acreage of mint today is geared to a high domestic consumption and a larger than normal export trade.

Today's leading use for mint oil is chewing gum flavor, with dentrifices following a close second. Other lesser uses are mainly candies, confections, and medicinal.

Exports of the 1951 crop have been lower, however, as indicated by the export figures for September and October of 1951, Table 4. Considerable carryover of oil in growers' hands is reported.

Table 4. COMPARISON OF MINT OIL EXPORTS, 1950 AND 1951.

Crop	September		October	
	1950	1951	1950	1951
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Peppermint oil .....	58,000	31,000	48,000	41,000
Spearmint (or other mint oils) .....	12,000	9,000	8,000	7,000
Total .....	70,000	40,000	56,000	48,000



### **Production of oil**

Mint production on farms today is classed as a field crop, although it requires more labor and a greater investment per acre in machinery than the average of what are considered field crops.

Under today's conditions it will take about \$100 per acre on an average sized operation to get an acre of mint in production.

Most machinery used in mint culture is usable on other farm crops that might be grown on the same farm. The notable exception is the mint still. It will require a minimum of \$100 an acre to set up a still that will properly care for the crop. However, the minimum cost for which a satisfactory still can be erected, regardless of how small the acreage, is about \$5,000. Very few mint stills being set up today will reach as low as the \$100 per acre or the \$5,000 total.

These stills can be considered to have no value in the production of other crops.

The large investments in equipment give advantages to operations of at least 50 acres in size. At the same time it is an exacting crop and operations of over 100 acres will often put the farmer to a disadvantage in properly controlling weeds, handling labor, timely harvest, and other factors influencing yield, quality, and cost of production.

It might appear, because mint has slack season for labor, that the crop is adapted to part-time farming or diversification. However, today most successful mint operations are predominately mint farms.

At present, most mint growers do not follow a rotation of crops.

### **Marketing**

Marketing of mint oil is characterized by a very small number of buyers who purchase oil from the farmer. Buyers' representatives arrange for contract or spot purchase of oil directly with the grower. These same buyers for the most part sell the oil direct to the consuming manufacturer.

### **Public relations**

The relationship between the oil producer and the consuming public is very remote. The oil is a flavor—not a food in itself—and has almost no relation to the price paid for the commodity by the consumer. The vast majority of consumers do not think of the oil producer in connection with commodity they buy. The mint oil grower is a farmer, however, and as such is concerned with the public relations problems of agriculture.

## The Future

### Acreage and use

In looking at the immediate future of mint the Committee refers to the recent increase in acreage. The increased production of oil has been disposed of on an expanded domestic and export market.

Having gone through this expansion period growers can expect a period when emphasis will be placed on quality of oil as affected by weeds, distillation practices, maturity, storage, and similar factors. The selection between high and low cost producers can be expected.

No material expansion in domestic or export market can be anticipated. This demand will probably increase slowly with the population and will be geared to purchasing power of the American people and the countries purchasing oil. Opinions have been expressed about the effect of the G. I. spreading the gum chewing practice around the world, and the probable improvement in the health practices of the American and other people in the world increase the use of dentrifices. However, these factors have no tangible basis for serious study in considering the future market for mint oil.

There is no real opportunity for the mint oil producer himself to expand the market since the demand for oil depends upon the demand for the product which the oil flavors and not upon the demand for oil itself.

In considering the long-time future for mint production in Oregon the history of mint production in the U. S. brings out forcefully the manner in which the production has shifted from one area to another as new areas developed certain advantages in production.

In areas where mint has been produced and on the farms producing it the growing of mint has been characterized by a concentration and intensification of mint on the individual farms and in the area in general. Rotation and diversification are usually not a general practice.

This intensified local production has been encouraged and in new areas by the good return per acre. Advantages in the production, particularly high yields that keep costs down compared to other areas, tend to encourage growers to go all out for mint. The outlay for equipment, particularly stills, further encourages the one crop system in order to utilize equipment to the fullest possible extent.

This one characteristic, namely concentration of mint acreage on certain farms and in certain areas, seems to lead to problems with disease, insects, weeds, fertility, and other factors.

The demand for mint oil is small enough that there is no pressure to bring new areas into production and perhaps only by chance

will the advantages of new areas be discovered. By the same token any area possessing an advantage in mint production is raising a crop in which there is always a good possibility that other areas will take over.

At present, mint oil production in the Willamette Valley holds a good advantage. Producers are getting good yields and the oil is of a quality desired by buyers. Production in the lower Columbia River area has developed some problems that has put it in a less favorable position. While the oil is of good quality, yields are down beyond economic return on many acres.

There is no way of determining whether or not a remedy will be found for the problems of the lower Columbia River area or if some of the threats in the Willamette Valley area such as wilt or symphyliids will develop into serious factors.

It is doubtful that the lower Columbia River area will go completely out of mint production, but material reduction of acreage with greater diversification is anticipated. Higher yielding soils and more efficient producers will probably continue to find mint a profitable crop even in the face of the problems now known to exist. Investment in equipment, knowledge of mint culture, and a liking for the crop will encourage some producers to continue even though returns are marginal.

What will happen in Willamette Valley areas will depend entirely on problems that might develop. There, as in the lower Columbia River area, mint production is becoming more and more concentrated in certain areas and farms are putting an increasing proportion of their land into mint.

At present eastern Washington irrigated areas have a big advantage in yield but a disadvantage in quality of oil. The future can not be predicted to any degree of accuracy. Problems of oil quality in this area may be remedied at least in part by better practices or new discoveries. At the same time certain diseases of mint such as wilt might be expected to raise havoc with mint production if they get into that area.

While no definite information is available on the Wisconsin acreage, the reported yields are good. Planting has been made carefully to avoid bringing in verticillium wilt and as long as the area can be kept free of serious pests and diseases it can be expected that they will have a production advantage.

Farmers now growing or considering growing mint will want to keep in very close touch with production in their own area and in competing areas. In mint more so than in most other crops there is a constant threat that factors affecting yield, cost of production, and

quality will develop. In mint production to date the mint oil producer has had very little or no control over these factors. Keeping informed is extremely important in determining whether or not he should go into, expand, or reduce mint production.

### **Foreign competition**

There is some speculation as to competition of oil produced in foreign countries. Foreign oil could compete with our foreign market or even with domestic markets. There is at present no definite information about the possibility of foreign competition.

## **Recommendations**

### **Research**

Scientific research as a basis upon which to make decisions in mint growing and marketing is extremely lacking. Most information available today is based on individual's experiences and opinions. Yet research could play an important part in whether Oregon retains a mint industry or not.

The Committee recommended that research work be done in the following aspects of our mint industry.

1. Agronomic problems—time of plowing, rotation, depth of plowing, cover crops, fertilizers, and related topics concerned with good soil management and handling a mint stand to the best advantage of the growing plant.
2. Disease and insect pest control.
3. Standardization of oils and the feasibility of grades that might be used in marketing oil. This would include a study of factors influencing quality such as weeds, maturity and distillation.
4. Cost of producing mint oil to serve as a guide to established growers and growers interested in starting production.
5. Harvesting methods and time including problems of distillation.

### **Culture**

The Committee recommended serious consideration of the soils problems that develop with continuous production of mint. Rotation, cover crops, and other means of increasing soil organic matter should be more widely used. Mint culture by nature is hard on soil. The soil is cultivated year after year, often plowed on the wet side, left plowed and bare over winter in some areas, and irrigated in the summer. Being a perennial crop there is a tendency to leave the land

in mint a long time and a survey of mint growing areas shows large proportions of the farms to be all or predominately mint. Rotation and diversification are recommended as important to proper soil maintenance and economic stability.

### **Taxation**

The Committee recognizes that there are inequalities in our present tax system. Land should be taxed according to its land use capabilities rather than the crop to which it is devoted at time of assessing. Assessing land on the basis of the crop it is growing has a serious effect on the use of this land in a rotation with soil-building crops giving a lower return per acre. It is recommended that an equitable system of land, building and equipment assessment be established on a basis understood by and agreeable to the farm people paying these taxes.

### **Public relations**

The Committee recognizes that although mint oil is not a direct food item and the relationship between producer and consumer is remote, higher prices for mint oil and the good returns obtained by some growers in some years have contributed to the misunderstanding that exists concerning incomes being made by farmers; particularly in these times of inflated prices. The Committee recommends that steps be taken by farmers in united action to improve the understanding and relations between labor, business, and agriculture.

It is further recommended that farmers themselves determine public policies and programs affecting agriculture and its relation to the economy of our nation.

### **Size and type of operation**

While mint is not recommended as the sole farm enterprise, as the basis for comparison under today's conditions an operation of 50 acres in mint is suggested as the minimum size for a full time mint operation. Soil productivity, ability of the operator, and many other factors influencing cost of production will of course vary the acres required. The estimate made is based on average production conditions and income requirements of the farm family.

Even on a farm diversified with other enterprises the Committee suggests 50 acres as a minimum-sized operation that will justify the necessary investment in equipment. Combined with other enterprises, as few as ten acres of mint are suggested as a means of becoming acquainted with the crop provided, however, that satisfactory arrangements can be made to hire distillation of the crop.

While the Committee recognizes that a majority of more successful mint operations today are all or predominately mint farms they have recommended a trend to greater diversification. Enterprises that can be successfully combined with mint should be carefully chosen. Livestock enterprises are recommended as offering the best opportunities to diversify. Certain crops, particularly some cannery crops, should be studied carefully to avoid conflicting seasons of peak labor demand.

# **Greenhouse Crops**

## **Subcommittee Report**

The statistics for the florist industry are meager and mixed with other phases of specialty crops production in all census figures in the past and somewhat so even at present. Special surveys made in Oregon show in 1936 a value of \$1,152,000 for greenhouse crops and \$53,000 for field-grown cut flowers. In 1940, 251 operators reported 2,374,880 square feet of greenhouse space selling produce valued at \$1,120,000 and \$130,000 worth of field-grown cut flowers. The latest figures show 286 owners reporting \$3,150,000 income from 3,150,000 square feet of greenhouse space.

The greenhouse vegetable men report approximately 190,000 square feet of glass in 1925 expanded at present to 309,000 square feet.

## **Markets and Marketing**

Markets have changed from local consumption of cut flowers to distribution to widely distant points due to improved shipping facilities and the desire of these markets for Oregon quality stock. This picture is modified, however, by the increased production in the field of many kinds of cut flowers, mainly in California.

The distance flowers may be shipped varies with the keeping quality of the various flowers. All are perishable and must be sold within a very few days of the time of maturity and harvest. Shipping by railroad has proved quite dependable but relatively slow when considering the short life of flowers. Increases of shipping rates without proportionate increases in flower prices have necessitated discontinuance of shipping to distant markets. Shipment of flowers from centers of production to outlying points in the state and neighboring states by motor stage was popular until discriminatory rates were put into effect a short time ago.

The speed of air shipment fits well into marketing of cut flowers but necessarily must be limited to the lighter, more expensive items. Thus, it is mainly corsage flowers such as orchids, gardenias, camelias, etc., that leave this area by air. Heavier cut flowers grown in the fields of California at low cost and shipped by air are seriously competing with greenhouse-grown flowers in many markets. Adjustments in production schedules, etc., must be made to meet this competition. Field-grown flowers are at the mercy of the elements. The

supply is not as dependable as from greenhouse sources. The quality of field-grown flowers varies widely also.

The potential market for flowers in all market areas is great. Nation-wide figures show that only 3 per cent of the people buy flowers for home beautification indoors. Many more buy for special occasions such as weddings, gifts to friends, hospital remembrances, funerals, etc. There remains a great untouched market which must be reached by a new and different approach. Prepackaged cut flowers are beginning to appear in eastern markets, being sold in super markets, department stores, and even in vending machines in a few places. This form of merchandising encourages impulse buying by a group of people never going near the retail florist shop. Prepackaged flowers may be sold in small units at low markup with large volume to give reasonable profit. Educating the public to the use of these flowers and the enjoyment derived from having flowers in their home will result in increased sales.

Potted plants and bedding stock because of their weight and relatively low value per pound are very much limited in their distribution. Pot-plant production will probably always remain a local item. Truck delivery to reasonable distances may be feasible if orders are of sufficient size.

The present popularity of foliage plants and planted containers for home, office, business houses, hotels, etc., shows the possibility for increased sales. This is a relatively new field in greenhouse production.

Until 1925 leaf lettuce was one of the main vegetables grown in greenhouses. The shipment of head lettuce from the South reduced the sale of leaf lettuce to almost nil. Tomatoes and cucumbers become the main greenhouse vegetable crops. Southern field-grown vegetables used to reach our markets in June. Now shipments from Mexico and Cuba reach our markets in January and continue to do so until May. In May, California shipments start and continue throughout the remaining season. The local markets demanding quality will continue to use greenhouse-grown and ripened tomatoes and cucumbers but beyond that the market is difficult to predict.

## Cost of Production

The greenhouse vegetable and florist industry is deficient in figures on the cost of production. The businesses, for the most part, are too small to allow the use of personnel trained in cost accounting. They are growers of a great many different crops, in most cases, with widely different requirements and lengths of time to produce



a saleable crop making cost accounting too difficult. A few of the large operators, undoubtedly, have made cost of production studies, but these figures are not available for publication.

If the greenhouse growers could and would do cost accounting, there would be some changes made in crops grown and more efficient methods of growing adopted. The industry needs cost of production studies.

## Production Practices

Commercial greenhouse growing is a relatively young industry. Research in this field is in its infancy. Hence, very great changes have been made in the past 25 years and even greater changes will come about in the future.

Until recently work was done with very simple tools and much hand labor. High wages and competition from other industries have forced the greenhouse owner to adopt as much machinery as possible. In many cases specialized machines were not available and it fell to the ingenuity of the individual to build his own "gadget" to do a given job. Many of these are worthy of patents and distribution to the others in the industry.

Production has changed from the individual nursing of plants to a state of near-perfection to mass production of crops with the best quality possible under such production methods.

The results of research have been adopted to greatly change production. A few examples follow: Soil sterilization to minimize soil-borne diseases and weeding replaces changing of soil after each crop. The use of plant bands instead of clay pots gives small plants a larger soil mass without increasing the bench area required, also reducing water loss and hardening of plants at an early stage. Conditions necessary for flower bud initiation have been determined and quickly adopted. Temperature is the deciding factor with some crops. Day-length is responsible in others. In some crops there is an interaction of both. Control of such factors makes possible the year-round production of chrysanthemums in place of a season of late September to early January. Geraniums may be grown from cuttings to flowering pot plants in 8 to 10 weeks instead of the 8 months required formerly. Close control of temperature in storage insures the uniform and early forcing of several greenhouse florist crops. Improved insecticides and fungicides applied under high pressure from modern sprayers cut down the time and amount of expensive spray material necessary to obtain good control of insects and diseases. Application of these materials in the aerosol bomb further decreases time required.

Careful planting and scheduling of crops increases the efficiency of use of greenhouse space thus producing a greater income per square foot.

## **Storage and Handling**

Storage of the finished crop is of very short duration since most greenhouse crops naturally live a short life. Recent developments in cut flower storage may revolutionize this phase of the industry. Dry storage of cut flowers at a temperature of 31 degrees F. markedly extends the storage period without reducing the quality of product delivered to the final consumer. The keeping period is the same or longer than with the best known methods of the past.

Grading has been a matter left up to the individual. No uniform grades have been established for cut flowers or pot plants. There is a great need for uniformity of grades. It would allow the retailer to order by phone and know what to expect upon delivery. It would allow a comparison of market reports from various areas. Unless the industry sets up such grades, grades may be forced upon the industry. Legislation is already under way in the Federal government demanding such a move.

Prepackaging of cut flowers will facilitate handling, reduce damage in packing and shipping, and reduce space required for storage.

## **Labor and Labor Supply**

Other industries have been able to draw employees from the greenhouse growers because of higher wages. More of the work must be done by the owner, his family, women, high school students, and a few faithful employees who value health and pleasant work to the extra wages.

Mechanization may sufficiently increase production per man to allow paying competitive wages. Following is a listing of some of the changes possible:

- Field preparation of soil with large machinery to replace composting.
- Use of loaders and trucks to replace shovel and wheelbarrow.
- Roller conveyors for moving all heavy items—much easier and much faster than hand carrying.
- Belt grading to replace bench grading.

- Machine tying of bunches of cut flowers.
- Use of soil shredders to replace screening of soil by hand.
- Soil sterilization to replace changing soil.
- Subirrigation, constant level watering or automatic overhead watering to replace hand hose watering.
- Nutrient solution culture of many crops to replace watering and fertilizing by hand.
- Automatically controlled ventilators.
- Automatically controlled heat in individual greenhouses.

These and others have been adopted by some members of the greenhouse industry who are businessmen as well as growers.

## Price Studies

The lack of uniform grades, the large number of different crops offered for sale, and the small size of the average business have made it almost impossible for effective price studies. Such studies would be very worth while to the industry.

## Recommendations

1. All phases of the industry have expressed a need for a soil testing service.
2. Varietal testing—many new varieties are put on the market each year. Even the larger growers cannot afford to use valuable space to experiment to see if they are suited to their conditions.
3. A more rigid plant inspection of material coming into Oregon from out of state.
4. New plants having desirable qualities from the consumer standpoint that can be grown economically.
5. New varieties having better keeping qualities and disease resistance.
6. Attention to specific crops as to culture, nutrition, diseases and insect troubles too numerous to mention.
7. Recommendations of results of research compared to old methods.
8. Adoption of new developments from other areas to Oregon conditions.

## The Future

Increase in population means increase in local markets.

Improvement in the standards of living will bring more people into the bracket that can afford and will want greenhouse-grown products.

Prepackaging opens a whole new field of merchandising.

Movement of population from apartments to their own homes gives pride of ownership; therefore, home beautification with bedding plants and interior decoration with cut flowers, flowering pot plants, and foliage plants will increase.

Greater knowledge of culture, disease control, insect control, etc., will give greater production per square foot of greenhouse space—result, lower cost of production—lower selling price—greater demand—greater volume—lower overhead and a second drop in price to consumer. Expansion is possible and possibly a slight expansion of greenhouse vegetable growing.

# Nursery Crops

## Subcommittee Report

Oregon's nursery industry has made many changes during the past 20 years. It is a relatively new branch of our agriculture and will undoubtedly change further in the years ahead. Many parts of the industry were in their infant stages 30 years ago, but today they represent a large portion of the income derived from nursery crops. Nursery acreage in 1936 was 1,860 acres with a return of three-fourths of a million dollars. The 1949 figures show Oregon to have 2,450 acres devoted to nursery crops with an income of three and one-third million dollars.

If this industry is to advance in the next two decades as it has in the past 20 years, the Committee recommends definite research work be conducted along the following lines:

- Development of sound soil management program
  - Improve soil fertility
  - Maintain organic matter content
  - Improve physical properties
  - Use of adapted cover crops
  - Crop rotation programs
  - Prevention of soil erosion
- Soil and water relations
  - Seasonal use of water by various plant species
  - Irrigation systems—types most adapted to various crops and soils
- Nutritional studies in relation to the use of fertilizers: fertilizer elements needed and their rates and methods of application as to surface applied and side dressed and application through irrigation systems
- Plant disease and insect control
  - Control of crown gall
  - Possibility of applying insecticides and fungicides through irrigation systems
- Weed control
  - Chemicals which may be used with a large degree of safety on nursery crops
  - Methods of application—rates and time of application
- Labor-saving machinery
  - Digging and balling machine for evergreens

Planters—machines which will handle cuttings, seedlings and liners

Sawdust spreader—a machine which will economically apply sawdust between nursery rows.

## Ornamental Trees and Shrubs

Prior to 1920 the nursery industry in Oregon consisted largely of fruit trees and fruit tree understocks. Since then, the ornamental tree and shrub stocks have grown to the point where they overshadow the fruit tree and understock business.

It is known that Oregon-grown ornamentals are of far better quality than those grown in other sections due to favorable environmental and climatic conditions. The Committee reports that the market for ornamental trees and shrubs is continuing to expand as there is still a shortage of specimen plant material.

At present about 90 per cent of the evergreens and conifers are marketed in the Pacific Northwest. The Committee feels that the expansion of balled and burlaped materials is limited due to high transportation costs. It is the Committee's recommendation that a transportation council be formed to cooperate with similar groups having like transportation problems. The deciduous ornamental shrubs and flowering trees have a brighter future for expanded markets outside the Northwest. Competition from neighboring states is ever present but not too serious if we continue to produce and sell only high quality plants. With this in mind, the Committee recommends that the nurserymen follow grades and standards of the American Association of Nurserymen.

Under the present conditions, the small nursery grower is unable to find adequate eastern markets for his plant materials. It is the Committee's feeling that the small grower should not expand faster than his market. Today many of the larger growers are marketing plants for smaller growers and this is to some extent satisfactory.

Broadleaf evergreens and conifer plants do not lend themselves to storage other than heeling-in in some suitable medium. Cold storage is, however, adapted to deciduous and bare-rooted shrubs and would extend the planting time to a limited extent. Research work on temperature and humidity in relation to storage life of deciduous nursery plants is recommended by the Committee.

Plant improvement by scion and stock selection is a valuable aid to the nurseryman and will be more important as the public demands. Additional research work on the phase of crop improvement is recommended.

## Rose Growing Industry in Oregon

The acreage of Oregon's field-grown roses was small in 1910 and remained so until 1920 when the acreage began to increase. Today the acreage of two-year-old field-grown roses is about 500 acres and the number of roses marketed in Oregon is estimated at 3,000,000.

In the early days of rose growing most of the plants were consumed by our local markets, but as the acreage expanded so did our markets. Today, Oregon-grown roses are shipped to every state in the Union. Many thousands are sent to California since our plants mature earlier in the fall.

Our main competition lies in the southeastern part of the United States, particularly in the state of Texas. More roses are grown in Texas than all other states combined. The expansion of our markets depends largely on transportation charges; but as long as Oregon growers produce only quality plants, we can dispose of our stock in eastern and California markets. The Committee recommends that we continue to supply our eastern rose markets with high quality plants.

Most part-time operators would not have the proper equipment needed in producing quality roses.

In the past when most roses were sold locally little attention was given to cold storage facilities. However, now that Oregon roses are shipped to many eastern points and many buyers want later shipping dates, cold-storage facilities will have to be expanded. The Committee recommends some experimental work be conducted in relation to storage, temperature and humidity.

In the past, understock and bud selection were not considered too important and were mostly a matter of chance. In the present state of production, however, many growers are carrying on programs of investigation on understock and bud selection.

Soil series and types are important factors in governing the understock selection used. One understock will produce well on one soil but poorly on another. Although this is an important factor, the Committee feels this is an individual grower problem.

The hybridizing of roses in Oregon is truly in its infant stages and should be expanded in the future. It is common knowledge that firms hybridizing roses are in a much better position on sales by creating and improving varieties for their customers.

## Holly Production

### Expansion

There are approximately 1,000 acres of productive holly trees in Oregon. The Pacific Coast area is the only region where there are ideal growing conditions for its production. This acreage is inadequate to supply the demand for holly as a Christmas decoration.

### Markets and marketing

Holly reaches American homes through florist shops, grocery stores, and by direct mail as gift packages. Every state in the Union is a potential market for our holly and one which has not yet been satisfied.

Cut holly is being transported by Railway Express, trucking lines, and air, with a minimum of difficulty. Rapid transportation is essential for this perishable crop.

Size of the operation has little bearing on the efficiency of production. Profits are by unit of production and do not increase with an expanded acreage.

Cooperative marketing is being practiced in Washington State at present and is of value, especially to the small producers. They also purchase supplies collectively.

Holly growing lends itself to part-time farming better than most crops. It does not require full-time care and little equipment is necessary for this work. Harvesting is done in a short time in the late fall.

Holly sells itself, almost, through the indirect advertising it gets in its use by commercial artists in designs for other things. This is a free promotion of an agricultural crop.

### Cost of production

A full-time holly producer is one who propagates trees for sale as well as one who cuts holly for decorative purposes. This type of production is more hazardous than that of a part-time producer who has other means of income.

The investment required under present-day standards for commercial holly growing will run around \$500 per acre. This should buy the trees and land. To bring the grove into production will cost about \$100 per year if labor is employed at the current scale.

### Production practices

Holly is a heavy feeder due to the heavy production of leaves and berries which are removed for selling. A continuation of the study of the fertilizer requirement of holly is recommended.



Irrigation is needed unless natural soil moisture can be maintained on land with adequate drainage. On steep slopes or where permanent cover crops are used, irrigation will be necessary.

Holly is attacked by various insects and diseases, some of which do not have an entirely satisfactory control. Continued research on these lines is recommended.

### **Storage and handling**

Storage is for very short periods and requires a minimum of consideration. Handling, while done rapidly, requires no expensive equipment like many other crops.

### **Labor supply**

The harvest season for holly comes at a season when many other crops are not requiring heavy labor. A few trained personnel can readily handle large crews in a satisfactory manner.

### **Price studies**

Many people who have holly do not know its value and selling prices often run under cost of commercial production. It is recommended that cost of production studies be made on this crop. It is further recommended that work be continued on the study of varieties and harvest and marketing information.

### **Crop improvement**

Much of the holly produced today came about with little benefit from marketing experience. Today the propagation is based on buyers' preference, production of desirable foliage and berries, and general performance.

The future in holly will be in named desirable varieties.

## **Fruit Stocks**

The fruit tree seedling phase of the nursery industry has increased greatly in the West in the last 30 years, and today the rootstocks grown for the entire United States are confined to the northwestern part of the United States (mainly Oregon and Washington). It is a rather specialized field and the majority of understocks are grown by six or seven nurserymen who produce about 15 million seedlings annually. The fruit tree seedlings consist mainly of apple, pear, cherry and plum with the bulk of the apple and pear seedlings being grown east of the Cascades.

The Committee recommends that the acreage of fruit tree understocks be maintained and very close liaison between the rootstock growers and the fruit tree orchardists be established.

At the present time there is a great demand for all types of dwarf fruit trees, but the Committee advises caution in relation to expanded dwarf rootstock plantings and recommends additional research on compatibility of varieties on dwarf understock and on handling of dwarf trees in general.

Also in this phase of the nursery industry arises the question of part-time growing of fruit stocks, both budded and understocks. From indications in the past, this system of growing has not proved too successful as there are many problems to be overcome for the part-time grower.

- Cost of special machinery—a necessity in order to reduce cost of operation and overcome labor shortages.
- Finding steady markets for his finished product.
- Finding time to get certain jobs done properly and at the right time.

Crown gall is the number one problem in the understock industry today. If this phase of the nursery industry is to survive, a definite research program must be directed to combat this disease.

## Berry Plant Growers (Strawberry and Blueberry)

Berry plant growers (strawberry and blueberry) were very small in number 20 years ago. Since that time, this phase of the nursery industry has grown considerably and today about 30 million strawberry plants are sold annually.

The Committee feels there is no need for an increased acreage for strawberry plants. On the contrary, the strawberry plant growers are reducing their present acreages but are striving to increase their production of plants per acre and to improve the quality of the plants.

There is in the blueberry plant industry an anticipated expansion of blueberry plantings for fruit production. Propagators are expanding their present facilities to keep abreast of this anticipated expansion.

The blueberry plant propagators recommend research work be conducted along the following lines:

1. A study of the varieties in relation to the various soil types on which they grow best.
2. A program which would attempt to establish a classification of grades and standards for blueberry plants.

# Vegetable Crops

## Subcommittee Report

Twenty-five years ago, less than 10,000 acres of crop lands were devoted to vegetable production in Oregon. In 1950, there were more than 90,000 acres, and the long-time trend continued upward. Slightly more than two per cent of the total crop land is now in vegetables, accounting for at least six and one-half per cent of total cash receipts received by farmers of the state. There has been a definite trend toward usage of Oregon's farm lands for production of crops with high per acre value, and vegetables have played an important part in this conversion.

In the early years vegetables were grown primarily for fresh markets. The marked growth of the vegetable industry in the past 25 years, however, has been due primarily to production for processing.

The sections that follow will show the changes in Oregon's vegetable picture, the rank compared with other states, and relative importance of individual vegetable crops for fresh market, canning, and freezing.

## Future Predicted Trends

The Committee foresees the following long-time trends in Oregon's vegetable industry:

- Continued importance of vegetables grown for processing—with generally increased production for canning and especially for freezing;
- Further expansion of irrigation facilities and usage;
- Improved rotation and diversification of crops and/or live-stock to maintain a sounder soil fertility program.
- Increased size of vegetable farms, as a result of effective use of mechanization; trend toward purchase of such equipment by the processor, for over-all usage;
- Emphasis upon mechanization to reduce labor costs;
- Emphasis upon production, processing, and advertisement of high quality products;
- Increased opportunity for local marketing of both fresh and processed produce through an increase in population of about 50 per cent in the next quarter century;

- Continued and probable increasing emphasis on science to meet the problems surrounding production, processing and distribution;
- Continued importance of transportation costs as a limiting factor in long distance shipment of Oregon-grown vegetable products;
- A long-time tendency toward long distance shipment only of high-value products, and an increasing emphasis on supplying vegetables for expanding nearby western markets;
- Increased emphasis on what constitutes high quality in specific vegetable products, on consumer preferences, and on means of meeting such preferences.

### Organization for Problems

These studies have pointed up the fact that we have no organization to handle the problems peculiar to the vegetable industry. In view of the growth of this industry within the state and its importance in our economy, the members of this Committee wish to go on record as favoring the formation of such an organization as would be necessary to adequately care for the problems of the industry. The possibility of strengthening the vegetable section of the Oregon State Horticultural Society should be explored. It is deemed especially desirable to create a vegetable organization that will take an active part in aiding in the improvement of marketing conditions and particularly in the attacks on freight rate problems.

Table 5. RANK OF STATES IN PROCESSED VEGETABLES AND DOLLAR VALUES FOR ELEVEN MAJOR CROPS.

1950 rank	State	Number of crops processed*	1939-48 average	1950
1	California .....	7	\$31,330,000	\$41,962,000
2	Wisconsin .....	9	15,551,000	18,934,000
3	New Jersey .....	9	10,837,000	16,886,000
4	New York .....	9	11,210,000	15,353,000
5	Oregon .....	8	6,819,000	12,043,000
6	Maryland .....	9	10,220,000	10,786,000
7	Washington .....	9	6,576,000	10,038,000
8	Indiana .....	7	12,454,000	9,609,000
9	Illinois .....	8	6,720,000	9,050,000
10	Pennsylvania .....	8	6,361,000	7,909,000

\* U. S. Department of Agriculture, Bureau of Agricultural Economics data. Eleven major processing crops considered: asparagus, lima beans, snap beans, beets, cabbage for sauerkraut, sweet corn, cucumbers for pickles, green peas, pimientos, spinach, tomatoes. Includes all types of processed products, but does not include such Oregon crops as broccoli, cauliflower, rhubarb, carrots, and squash.

## Over-All Vegetable Processing

Oregon now ranks among the top five states in value of processed vegetables, based on eleven major processing crops. Considering all vegetables, Oregon may rank even higher, because of relatively heavy production of such additional miscellaneous crops as broccoli, cauliflower, rhubarb, carrots, and squash.

### Oregon's place in major processing vegetables dollar value in 1950

- LIMA BEANS** —Oregon rankage now low. Leading states: Delaware, (green) California, New Jersey, Maryland, Wisconsin, Virginia, Pennsylvania, Michigan, New York and Washington.
- SNAP BEANS** —Oregon ranks first, ahead of New York, Wisconsin, Maryland, Washington, California, Pennsylvania, Florida and Tennessee. Acreage has increased almost 200 per cent in 10 years in Oregon.
- BEETS** —Oregon ranks third, behind Wisconsin, and New York. Other leading states: New Jersey and Michigan.
- SWEET CORN** —Oregon ranks sixth, behind Minnesota, Wisconsin, Illinois, New York, Maryland. Many other states can corn: Idaho, Iowa, Pennsylvania, Maine, Indiana, Ohio, Utah and Delaware. Oregon acreage has been increasing much faster than in other major states.
- CUCUMBERS** —Oregon ranks eighth, behind Michigan, Wisconsin, (pickles) California, North Carolina, Colorado, Georgia and Maryland. Oregon acreage has about doubled in the past decade.
- PEAS** —Oregon ranks third, behind Wisconsin and Wash- (green) ington and ahead of such important states as Minnesota, Illinois, New York, Pennsylvania, Maine, Idaho, and Maryland. Oregon acreage has been increasing, while in many states it has decreased.

## Canned Pack

Table 6 shows the comparative canned pack statistics for Oregon-grown fruits, berries, and vegetables. In the past twenty-five years there has been an approximate twenty-fold increase in the

Table 6. COMPARATIVE OREGON CANNED PACK STATISTICS,  
BY CASES.

Product	1925	1950	1951
	Cases	Cases	Cases
<i>Fruits</i>			
Apples .....	365,120	Misc.	<sup>2</sup>
Applesauce .....		128,928	<sup>2</sup>
Apricots .....			Misc.
Cherries, D. S. ....	14,296	75,309	136,259
Cherries, L. S. ....	97,558	83,027	245,990
Cherries, R. S. P. ....	6,547	60,795	97,869
Peaches .....		70,893	116,261
Pears .....	540,993	1,717,904	1,574,468
Plums .....	31,456	827,745 <sup>1</sup>	1,187,463 <sup>1</sup>
Prunes .....	182,529		
Miscellaneous .....	975	341,887 <sup>3</sup>	11,914 <sup>4</sup>
Total .....	1,239,474	3,306,488	4,054,224 <sup>5</sup>
<i>Berries</i>			
Blackberries .....	221,661	31,929	112,836
Boysenberries .....		80,037	103,172
Gooseberries .....	47,933	32,095	32,956
Loganberries .....	345,270	33,399	30,547
Raspberries, black .....	25,650	5,832	890
Raspberries, red .....	53,599	39,040	25,530
Strawberries .....	114,636	14,063	18,655
Youngberries .....		2,626	4,212
Total .....	808,749	239,021	328,798
<i>Vegetables</i>			
Beans, green and wax .....	153,301	3,560,357	<sup>6</sup>
Beets .....	74,894	1,237,870	1,347,950
Cabbage .....	2,367		
Carrots .....	63,591	249,759	379,233
Corn .....	4,500	394,750	596,974
Onions .....	3,300		
Peas .....		2,648,400	2,392,617
Pumpkin .....	85,380	82,244	203,824
Rhubarb .....	3,261	Misc.	Misc.
Tomatoes .....	27,762	Misc.	Misc.
Turnips .....	5,423		
Miscellaneous vegetables .....	894	190,408 <sup>7</sup>	288,744 <sup>8</sup>
Total .....	424,673	8,363,788	<sup>6</sup>

<sup>1</sup>Purple plums.

<sup>2</sup>Pack not completed.

<sup>3</sup>Includes apples, apricots, crabapples, green gage plums, and Reine Claude plums.

<sup>4</sup>Includes crabapples, apricots, green gage plums, yellow egg plums, and Reine Claude plums.

<sup>5</sup>Incomplete. See footnote 2.

<sup>6</sup>Not ready for release.

<sup>7</sup>Includes rhubarb, sauerkraut, vegetables for salad, tomatoes, tomato juice, peas and carrots, and red kidney beans.

<sup>8</sup>Includes peas and carrots, sauerkraut, rhubarb, red kidney beans, vegetables for salad, tomatoes, and tomato juice.

Source: Northwest Cannery Association.

canned pack of vegetables—from 424,673 cases in 1925, to 8,363,788 cases in 1950. This, clearly, has been one of the outstanding agricultural developments of the past quarter century in this state.

## Frozen Vegetable Pack

In 1950, the value of frozen pack vegetables in Oregon was approximately \$11,000,000. According to the Northwest Frozen Food Association the crops composing a major part of the pack were:

Beans, green and wax, 12,537,000 pounds

Cauliflower, 3,424,000 pounds

Corn (cut), 4,663,000 pounds

Corn (on cob), 1,467,000 pounds

Peas, 22,154,000 pounds

Other vegetables, 15,490,000 pounds

The miscellaneous (other) group included asparagus, broccoli, carrots, lima beans, peas and carrots, rhubarb, spinach, pumpkin and squash and mixed vegetables.

It has been estimated by those well informed in the industry that the frozen vegetable pack may be expected to increase about 5 per cent per year. If such were the case, in 25 years we would be freezing 200,000,000 pounds of vegetables, valued, in terms of the present dollar, at over \$30,000,000. We may contemplate, we believe, a steady and appreciable growth in this already important phase of the vegetable industry in Oregon.

## Growth of quick freezing industry

Growth of the quick freezing industry in the Oregon-Washington area can best be illustrated by the facts on pack figures shown in Table 7. (The year 1937 is used for comparative purposes, for it is the first year in which frozen pack figures for a large number of crops are available.)

Accurate "breakdown" figures for the two states on several of the crops are not available, but for the pack as a whole the trend would be similar for each of the two states.

It is common knowledge that this area pioneered the frozen vegetable industry, and the great increase in the pack (from six to one hundred-fold for various individual items) is proof of the sound foundation on which the industry stands. Quality products, made possible by the fine climate and advanced techniques in quality control in the processing plants, have created the consumer demand which is responsible for the expanded markets.

Table 7. INCREASE IN FROZEN-FOOD PACK.

Product	1937	1950	Increase
	<i>Pounds</i>	<i>Pounds</i>	
Asparagus .....	900,000	6,900,000	Seven-fold
Snap beans .....	2,200,000	17,000,000	Eight-fold
Broccoli .....	500,000	8,100,000	Sixteen-fold
Carrots .....	80,000	1,600,000	Twenty-fold
Cauliflower .....	200,000	3,800,000	Nineteen-fold
Corn, cut .....	1,700,000	11,100,000	Six-fold
Corn, on cob .....	400,000	2,400,000	Six-fold
Peas .....	11,000,000	84,000,000	Eight-fold
Peas and carrots .....	60,000	6,400,000	One hundred-fold
Rhubarb .....		2,800,000	
Spinach .....	800,000	6,000,000	Seven-fold
Squash .....	400,000	6,600,000	Fifteen-fold
Succotash .....		1,807,000	
Mixed vegetables .....		6,900,000	

Source: *Western Canner and Packer*.

It is recognized that there must be improved marketing facilities and education of handlers in handling quick-frozen products.

## Truck Crops for Fresh Market

In the past decade, Oregon's acreage of vegetables for fresh market has remained more or less static. More of the state's fresh vegetables are being used locally and less shipped. The static fresh vegetable acreage contrasts with the increased acreage of vegetables for processing. BAE acreage estimates are listed in Table 8.

Table 8. FOODS PROCESSED COMPARED WITH FRESH MARKET.

Use	1939-48 average	1950
	<i>Acres</i>	<i>Acres</i>
Processing .....	51,000	72,230
Fresh market .....	14,800	12,730
Total .....	65,800	84,960

Source: *Bureau of Agricultural Economics, U. S. Department of Agriculture*.

The 1950 value, to the farmer, of fresh market vegetables in Oregon was approximately \$5,000,000 and represents a ranking of nineteenth among the 48 states. While there has been no trend in increased acreage of truck crops for market, this phase of the in-



dustry is, nevertheless, of distinct importance in Oregon, as indicated by the relative rank in states. A large part of this acreage is grown for local "fresh" markets, and this acreage may be expected to expand with increase in population. The acreage grown for shipment of vegetables outside the area is influenced by market and production factors in many cases entirely beyond the control of the local producer. As a result, it is difficult to predict future trends.

## Farm Gardens

Vegetables for farm household use produced on 47,643 Oregon farms in 1945, were valued at \$4,017,000 according to census reports. The value may be greater today. This is an item often overlooked in assessing the over-all value of vegetables grown in the state. In western Oregon, in particular, small farms are numerous—many of them operated on a partial self-supporting basis. With increasing population this type of production may increase and vegetables will play, as now, an important role in the family's food budget. The educational work of public agencies in aiding these gardeners in general production practices is commended. Results of research work, directed toward solution of commercial vegetable problems—in both varietal and cultural aspects—may, also, often benefit the home gardener.

## Possible Western Developments

It must not be taken for granted that the present centers of vegetable production in Oregon will remain static. These questions may well be asked: Will not water come, in the decades ahead, to such large acreage, fertile, areas as the "wheat lands" near Pendleton? What will be the vegetable picture in lands irrigated under Grand Coulee—a development destined for the immediate future? If vegetables are grown on these potentially large acreages, utilizing modern advances in mechanization, what chance will Willamette Valley have as a competitive area? Will the Willamette Valley become so heavily populated, so cut up with small land holdings, that competitive, economic production of vegetables—particularly for processing—will be difficult? Or, on the other hand, will the over-all population of the West become so great that all of these lands will be required for intensive culture of food crops? This cannot be expected in the next 25 years, to be sure, but 25 years is a brief span, in terms of long-time developments.

It is not deemed worthwhile, at this time, to attempt an analysis of possible shifts in vegetable production to new areas. It is felt advisable, however, to warn that population pressures, and large irrigation developments should be carefully watched by leaders in the vegetable industry so that changes on the part of individual growers, cooperative groups, and others may be made in order to "roll with the punch," when it does come.

## **Transportation Costs**

A large volume of Oregon's processed vegetables must be marketed in the Midwest and East. It is well recognized that freight costs, superimposed upon already high production and processing costs, must be absorbed before Northwestern-grown products are placed on the shelves in competition with products of the areas. A major restricting influence on expansion of vegetable production in Oregon is increasing freight rates. This is a challenge to all western agriculture and industry and this Committee urges the development of a state-wide organization of agricultural and allied interests to coordinate a determined and continued attack on the problem.

In this connection it is well to keep in mind that expansion over and above the consumption of any particular crop west of the Rockies might well be limited to those vegetables which have a relatively high per ton value so that freight costs do not represent such a large percentage of the total cost to the consumer.

## **Markets**

Limitation in expansion of vegetable production in Oregon is primarily one of markets. There is still much land that could be placed in intensive crops, such as beans, if there were a market to take care of such expansion.

It is important that every effort be made to expand market outlets, particularly for processed vegetables.

The rapidly expanding population in the West will result, automatically, in expanded local markets in the future. A 50 per cent increase in population for the eleven western states is conservatively estimated by the U. S. Bureau of Agricultural Economics within the next 25 years (from the present 19,500,000 to 30,000,000).

While the trend in production of fresh vegetables for shipment has been downward, it is believed that the demand for food by the increasing population will more than offset this tendency within the

next two decades. There should be opportunity for expansion of road-side and other markets near centers of increasing population.

We believe that studies of vegetable byproducts should be expanded to increase market potentialities.

Growers need to watch current market conditions in planning production and marketing. Current information on prices offered growers for fresh and processing vegetables is needed.

## **Production Cost Data**

Letters were sent to each of the 48 state agricultural colleges in this country asking for information on yields and per acre production costs of the major vegetable crops. The replies revealed the virtual nonexistence of up-to-date information on cost of production of various vegetable crops in the various states. This makes impossible at this time a detailed analysis and comparison of production costs between Oregon and other production areas.

It is clear that there is a need for data on gross income and net returns per acre, over a period of several years, for several of the major producing areas, and for several of the major vegetable crops. This is the very foundation upon which sound planning should be made. It is recommended that economists make such studies on major vegetable crops, to indicate the weaknesses in present markets, areas within which Oregon products should best compete, and the products which have the best chances for future expansion. Relative wage scales should also be studied to emphasize our weaknesses and point out the possible need for mechanization.

## **Improved Labor Conditions**

In connection with labor problems, the Committee feels that local and state-wide labor councils should be developed, at the employer level, to promote better housing, better transportation facilities, and improve treatment and handling of agricultural workers.

## **Vegetable Grades at Processing Plants**

It is recommended that Federal-State graders be present in processing plants to standardize grades of raw products as they enter the plant, to provide unbiased, uniform grades for both producer and processors.

## **Small Packages**

It is believed that the consumer-type package will continue to increase in importance. A large percentage of fresh vegetables in retail stores will be sold in such containers.

While the large grower may find it advantageous to package his product in consumer-size containers, it is felt that the wholesaler ultimately will do most of this type of packaging. If so, what are the best methods that the farmer may use in shipping his produce to the terminal markets? There is a need for study in this field designed to deliver produce to the market in the most efficient, economical manner.

In canned products there is a trend toward the smaller sized can.

## **Superior Quality Must Be Maintained**

It is a necessity that the relatively superior quality of Oregon-grown processed vegetables be maintained. It is this characteristic which brings a premium that pays, in a large part, for the transportation of our products to distant markets.

Cool nights, long sunny days of summer, and relatively low cost irrigation are natural advantages which make possible the production of superior quality vegetables. These natural advantages should be strengthened by use of improved cultural practices, good varieties, and the best processing methods.

## **Taxation**

Farm land should be assessed on an equitable basis—not on the basis of particular crops grown.

High taxation is forcing vegetable farms further from the cities and towns of Willamette Valley. The trend is expected to continue.

## **Advertising**

The Committee commends the Associated Blue Lake Bean Packers, organized to promote through advertising and other means the sale of Oregon beans, and recommends that means be studied to advertise the high quality of other Oregon vegetable products. Growers should actively contribute to these ventures.

## Size of Vegetable Farm Unit

The Committee does not feel that it can set a definite figure for the most economical size of a vegetable farm unit. It is, however, recognized that large operators have advantages in economical operation which cannot be matched by the grower on a limited acreage. It is believed that there will be a tendency for increased size of farm, particularly for production of processing crops. This will result from the economic necessity for growing at the lowest possible cost, to meet competition from large-scale operators in other areas.

No direct discouragement of the small farmer is meant, for many are here to stay. It must be recognized, however, that he must in some way offset operational disadvantages, such as by the maintenance of a cow or two, chickens, and a family-size garden.

Capital outlay requirements must be studied carefully by prospective vegetable growers to insure reasonable chances for success.

## Part-Time Vegetable Farmer

In the production of highly competitive vegetable crops it is felt that the part-time farmer should be discouraged. He is unable to give the growing crop the constant attention it demands, with the result that he will experience great difficulties in production, and will often attempt to market inferior produce, which should not be placed in the markets.

## Mechanization

With the continuing long-time trend of American families to leave the farm, and the probable acceleration of this trend in the years ahead, more and more thought must be given to the mechanization of agriculture from the points of view of all phases of the industry, plant breeding, producing, processing, transportation, marketing, etc.

There seems no alternative to the development of machinery to do nearly all the jobs for which we now depend on seasonal farm labor.

A clearing house of ideas for mechanization is recommended. It is further recommended, in this connection, that the college develop an information digest for the vegetable industry, which would serve as a medium of exchange of new developments originating with county agents, fieldmen, growers, research men, and closely allied agricultural fields.

## Soil Conservation

Conservation practices should always be kept in mind in connection with vegetable production. Over-all yield and quality of vegetables is dependent upon rich soils, in good physical condition. Cover-cropping, rotation, leveling, drainage, supplemental irrigation, contouring, etc., are of great importance in insuring that Oregon vegetables will rank among the highest in quality produced anywhere.

## Soil Fertility and Fertilizers

Expanded research to determine the most economic usage of fertilizers for major vegetable crops in various areas of the state is recommended. Such tests should include method, time, kind, and amount of application of commercial fertilizers and should be integrated with irrigation work. A long-time objective should also be the interrelations between commercial fertilizer usage, organic matter from crop residues and green manures, and livestock. The expanded use of irrigated pastures should fit in well with rotation schemes for production of high per acre value vegetables. This diversification should result in a more stable soil fertility picture.

## Irrigation Problems

Many problems, in connection with irrigation of vegetables, need study. For a given crop and given size of farm how much can one afford to spend on irrigation equipment?

What are the actual irrigation requirements of the various vegetable crops? Amounts? Frequency of application? Soil type effects? Time of day? Effect on occurrence of diseases in certain crops, such as cucumbers and beans? What fertilizers may be applied in the irrigation water? Influence on harvest dates, especially in present nonirrigated Portland areas?

The year 1951 will be recalled as that in which water rights were taken up on nearly all the available streams west of the Cascades. Well drillers have been working feverishly and supply people have been swamped with orders for pumps and pipes. Many growers, using irrigation for the first time, ponder the questions just asked. There is, clearly, a great need for study of the economic usage of irrigation for vegetables, which in general have relatively heavy water requirements.

It is pointed out that in the near future all vegetables will need to be irrigated—in fact must be irrigated to meet contract requirements of processors.

## **Control of Insects and Diseases**

Wherever vegetables are grown, control of insects and diseases presents major problems.

Under the individual crop sections that follow, major insect and disease problems in Oregon will be pointed out. It is a necessity that research be continually directed toward the best possible control of these pests; that the information be extended to the grower at the earliest logical time; that growers become familiar with limiting diseases and insects and with materials required for their control.

## **Varieties of High Consumer Appeal**

Few of the vegetable varieties now grown in Oregon were developed specifically for the area. It is reasonable to predict that energy directed toward purposeful hybridization and selection for adaptation to our climate, soils, insects and diseases would be to the best interests of the industry. Particular emphasis should be placed on quality types, to add to the advantages in quality resulting from favorable climatic conditions.

## **Progressive Cultural Practices**

Vegetable crops are notoriously demanding in their attention to detail. A brief lapse into improper care, and the crop may be lost. The weakest link in the cultural chain may determine final yield and quality. Usage of new mechanical devices; of new chemicals, perhaps for seed treatment, soil treatment, growth regulation, weed control, etc., should be followed—cautiously, to be sure.

No one of the previously discussed factors will insure success—their combination is a necessity. It is recognized that each crop presents its own peculiar problems, and for that reason the section that follows is based on individual crops which now play (or perhaps in the future may play) a major role in vegetable production in Oregon.

## **Individual Crop Problems and Recommendations**

### **Asparagus**

The greatest potentialities in asparagus production appear to be in eastern Oregon. In the Milton-Freewater area, the chief deterring factor is labor for harvesting. Some method of mechanical harvesting

would result in considerable acreage increases in the area, because the crop could precede pea harvest, and permit an earlier opening of processing plants.

In the Willamette Valley, cold, wet soils of spring and serious weed problems are encountered and acreages have declined. Weed control may be met by chemical herbicides, but adverse weather at harvest would continue to be a problem.

The so-called "running out" of large California asparagus plantations may be met by new variety developments. No great decrease in production in that state, over a long span, can be foreseen.

It is recommended that a continued study of market outlets be made for canned and frozen asparagus, and that means be studied to reduce labor operations, particularly in harvesting. The approximate 400 acres now in asparagus will expand only through utilization of the product by processors.

### **Snap beans**

The snap bean (with a few wax beans) is today the state's major processing crop west of the Cascades. Value to the farmer has been around 6 million dollars. Value of the processed product is roughly 15 million dollars. In 1925 there were 153,000 cases packed; in 1950, the pack was 3,560,000 cases. Plant equipment to handle the crop is valued in millions of dollars. From 5,000 to 7,000 acres are being planted yearly.

Oregon's top rank in bean processing is due to one major factor: superior quality of product. This has been made possible because of: the pole Blue Lake variety, the cool climate, the long days of sunshine, timely irrigation, and careful processing.

Foreseeable developments in mechanical harvesting of bush beans, at greatly reduced costs per ton compared to hand picking of Blue Lakes, offers a serious challenge to western Oregon's leading vegetable crop. The following action program is therefore recommended:

- Exhaust every effort to keep transportation costs down.
- "Sell" the consumer on the premium quality of Oregon beans.
- Mechanize all operations to fullest degree, including work on mechanical pole bean harvester.
- Maintain the best cultural practices to secure heavy yields—soil fertility, irrigation, weed, disease, and insect control.
- Improve varieties especially adapted to Oregon, such as Blue Lake type bush beans and better Blue Lakes for yield, quality of disease resistance and uniformity of maturity.



- If bush beans become important in this area, heat unit information may be needed to permit proper spacing of plantings.
- Explore use of growth regulators in bean production.

### Table beets

Table beet acreage, largely in Willamette Valley, has ranged from 1,500 to 2,600 acres in recent years. Most of the crop is canned. Quality of the product is excellent, well above average. The climate is ideal. It is clearly recognized, however, that the beet is not a high value crop, and that, in spite of superior quality of product here, it is less able to pay freight costs in terms of price differentials on the store shelf. There were 74,800 cases canned in 1925; 1,347,000 cases in 1951. It is the fourth most important processed vegetable grown in Oregon at this time. The crop is expected to maintain an important place here, but no great increases are foreseen in the next several years.

Suggested action programs follow:

- Continued study of market outlets, and means of reducing freight costs.
- More specific information on kind, amount, placement, time of applying fertilizers.
- Better control of damping off.
- Study factors affecting efficiency of boron in controlling canker; also study possibilities of developing canker-resistant beets.
- More efficient weed control.
- Curly top resistant beet for eastern Oregon.

### Cabbage

Cabbage is one of the major fresh market vegetables, grown now largely in the Portland area. In recent years about 2,000 acres have been grown for fresh market and processing, although largely for fresh market.

A steadily increased demand, through local population increases, may be predicted. No major increase for outside shipment is foreseen, because of wide adaptability, heavy yields, and normally low value of the crop. Major acreage may be expected to remain in the Portland area, near the largest local market outlet.

Action programs suggested:

- Improved control of club root, especially on irrigated land.
- More information on relationship between lime, fertilizer, and cover-cropping on yield.

- Information on value of cover crops in the rotation.
- Continued evaluation of new insecticides in cabbage maggot and aphid control.

### **Lima beans**

From 1940 to 1948 an average of approximately 500 acres of lima beans were planted annually in Oregon for processing. The acreage has declined greatly since then, due to erratic behavior of the crop. Western Oregon's temperatures are too low for present varieties of limas. There may be, in future years, an increase in acreage of this crop in eastern Oregon.

Nationally, lima bean production has increased greatly during the past decade. These beans compete with Oregon-grown peas and snap beans in the markets.

It is recognized that the lima bean would be a valuable addition to the varied list of vegetables processed in western Oregon, but some means would need to be found to secure earlier maturity, preferably between mid-August and the first week of September.

Production problems are relatively important with this crop, and include:

- Need for improving germination and uniformity of stands.
- Need for locally adapted varieties that will set pods well and in a concentrated manner when the plant has reached good size.
- Possible use of hormones to regulate pod set and maturity.

### **Cantaloupes**

From 1939 through 1946, yearly plantings of cantaloupes in Oregon ranged from 650 to 900 acres. Since that time, there has been a decline. Apparently, our local melons, coming in of a necessity late in the season, have not been of sufficiently superior quality to offset the steady and sure flow of medium quality melons from California.

With increased population in this area, there should be increased opportunity for the market grower to sell locally grown melons, in roadside stands and in other markets. The key is superior quality of product, marked to identify the Oregon-grown melon.

It is suggested that local melon growers:

- Improve their seed stocks.
- Market only melons of superior quality.
- Use cultural practices which will promote healthy vine growth.
- Establish "trade-marks" to identify locally grown melons.

## Carrots

For several years, from 1,200 to 2,000 acres of carrots have been grown for processing and fresh market, with, roughly, an equal division of acreage between the two. There appears to be a tendency for decline of acreage at present. The cool temperatures of this area are highly favorable to the production and processing of a high quality product. However, as with beets, the limiting factor in expansion is favorable markets. The processed product is not of enough monetary value to permit addition of high freight costs. The fresh product also offers heavy competition in the case of this crop, which can be grown well in several other areas and shipped in the fresh state throughout the winter. There may, however, be a long-time trend toward use of more canned and frozen carrots. Use of carrots in mixed vegetables has been increasing. No great change in acreage is foreseen.

There has been a trend toward heavier marketings of topped, high quality carrots, as compared to marketings with tops attached. Packaging of the topped roots in transparent, consumer-size packages, may increase.

The following problems exist in carrot production :

- The carrot rust fly is increasing in importance, and economical means of control need continued study.
- A slightly longer, blocky type carrot for processing would be valuable.
- More exact information on fertilizer and irrigation requirements is needed.
- Value of precision type planters and various seed treatments needs investigating, to secure more uniform stands and heavier yields.

## Cauliflower and broccoli

From 1,500 to 1,800 acres per year have been planted recently to these crops, with a tendency for some increase, especially of broccoli, which has rapidly gained favor as a quick frozen product. The Portland area leads in production and irrigation facilities are being expanded.

The climate of western Oregon is excellent for these two crops, and limitations in acreage may be expected to be due to markets rather than production problems.

Moderate expansion of acreage of broccoli, in particular, may be expected in the years ahead.

The following action programs are suggested:

- Develop information on best irrigation and fertilizer practices.
- Club root control.
- Clarification of cause of dead florets in broccoli heads, with control measures.
- Means of preventing mildew of cauliflower heads.

### **Celery**

From 400 to 600 acres of celery were planted in Oregon in the years 1939-1946. In the past few years this acreage has been cut approximately in half. Areas such as Michigan, California, New York, Utah, Colorado, have advantages in nearness to markets, and shipment of fresh celery from Oregon does not look promising for the future. Limited production here for local markets may be expected to continue.

Celery blight causes severe damage unless application of fungicides is continued from week to week. Search for a blight resistant variety should be continued.

### **Sweet corn**

Approximately 14,000 acres of sweet corn (largely in western Oregon) have been planted in recent years, with about 75 per cent of the acreage used for processing. A decided increase in acreage has taken place in the last 10 years. Twenty-five years ago there were 4,500 cases of corn canned in Oregon; in 1951 there were 596,900 cases. In 1937 in Oregon and Washington there were 2,100,000 pounds quick frozen; in 1950, there were 13,500,000 pounds frozen. This rate of increase is not expected to continue.

Oregon should be able to maintain a large acreage for processing, even though markets may be largely in the West. Maintenance of a high-quality whole kernel pack is especially important. The climate is excellent, because of sunny, dry weather, and low temperatures which provide relatively great leeway for harvest at a high quality stage.

Suggested items worthy of future attention are:

- For fresh market improved packaging, storage, handling, and display in retail stores are needed.
- It is believed that a major means of increasing yields would be by use of more irrigation; efficient and economic usage of irrigation water and fertilizer needs study; relation of stand (spacing) should be given attention in such studies.

- A variety with yield and quality of Golden Cross, but earlier, is needed by some growers for both fresh market and processing.

### Cucumbers

For several years, the cucumber acreage has fluctuated between 1,200 to 2,000 acres, much of it in Multnomah and Columbia counties—largely for processing. Many small growers are involved. The acreage will be stable or perhaps increase moderately, if production problems do not become limiting. A virus disease has caused heavy losses in the St. Helen's area. Lack of water has also limited yields in many instances.

Suggestions for improvement follow:

- Determine the economy of irrigation usage for cucumbers.
- Continue the search for a virus resistant Snow's Pickling type; or if necessary develop such a type. (The new M17 appears promising).
- Secure more definite information on value of fertilizers.

### Lettuce

Small plantings of lettuce may be found throughout the state, but major acreage for carlot shipment is located in Malheur County. A recent appreciable decline in the Malheur acreage has occurred, largely in spring plantings. Erratic spring weather and marketing problems have been encountered. The fall crop has been more profitable. In 1946 a peak of 4,150 acres was reached; the acreage since that time has declined 50 per cent or more. Competition with California is serious, and in addition new heat and tip-burn resistant varieties such as Great Lakes are making possible production in areas not heretofore adapted to lettuce.

Production for local use should increase slowly with increase in population. This means, however, that a good quality product will have to be placed on the market in order to compete with the California lettuce. Variety developments should be followed, to determine whether new types may be especially adapted to Oregon.

### Onions

For several years, from 4,000 to 5,000 acres of onions have been planted in Oregon, making it one of the major vegetable crops. Two distinctly important areas of production should be noted—one in the peat soils of Willamette Valley and the other in Malheur County. The long-time tendency has been for a decline of acreage in Willamette Valley and an increase in Malheur County. Opportunity for

greatly increased acreage in eastern Oregon irrigated areas is inherent in the facilities available, but markets are the limiting factor.

Opportunities for improvement of Oregon's status:

- Improve all cultural practices—fertilizers, weed control, etc.—to highest degree so that heavy yields will offset competition with areas nearest markets.
- Find a heavy yielding better storage type onion for Malheur area; a heavy yielding brown type onion for western Oregon.
- Continue the search for mildew, pink root, and thrips resistance.
- Continue to test new developments in maggot control.
- Make periodical studies of markets and changing conditions in other production areas.
- Follow developments in use of  $F_1$  hybrids, which offer possibilities of heavy yields.

### Green peas

Recent yearly plantings in peas have been roughly 50,000 acres. In 1925, no peas were canned in Oregon; in 1951, 2,392,000 cases were canned. In 1937, 11,000,000 pounds of peas were quick frozen in Oregon and Washington; in 1951, 84,000,000 pounds were frozen. This great development in the vegetable industry was not foreseen twenty-five years ago. A small acreage for quick freezing is planted in western Oregon. Acreage for fresh market peas has virtually disappeared, since the housewife no longer sees the need to shell peas by hand.

The rate of acreage increase of Oregon peas for processing may not be expected to continue, but a long-time trend upward may continue. Advantages of northeastern Oregon areas in pea production are many: a pea-wheat rotation has proved excellent; yields are generally reliable and relatively high; high quality varieties can be grown; large acreages reduce production costs; elevation differences permit a long harvest season.

### *Labor*

Until such time as pea growers have some sort of revolutionary pea harvesting equipment, growers will be dependent on migratory labor to harvest the pea crop in this area. The Mexican Nationals have proved most satisfactory and efficient.

We therefore believe that the State Department, United States Department of Agriculture, and Federal Office of Labor should do

everything possible to work out a satisfactory program for the annual importation of Mexican Nationals to harvest our crops.

#### *Freight rates*

Freight rates on peas are too high. We ask the Interstate Commerce Commission to lower freight rates on peas to Eastern markets. With increasing population in the Pacific Coast states, we believe the industry should do everything possible to capture and retain this West Coast market.

#### *Vining and harvesting of peas*

There has been no appreciable change in the vining of peas since the first viners were developed. We recommend that research be initiated to develop a better and cheaper method of harvesting peas for processing.

#### *Grading of peas*

We believe that there would be better feeling and relationship between growers and processors if the pea industry had Federal-State grading and weighing. We would point out that sampling would have to be representative and that the graders employed would have to be carefully and thoroughly trained if such a system is to be accepted by farmers and processors.

#### *Feeding and utilizing pea vines*

There are on the average about 100,000 tons of pea vines per year produced in Umatilla County. Approximately 65,000 tons went into pit silos in 1951.

We believe that there is opportunity to feed livestock more pea vines in the form of hay and silage in this area. However, there has been very little research work done on this problem and the Committee feels that experimental work should be initiated to determine the kind of livestock to feed out and the best amounts of vines to feed, and that the management problems connected with the utilization of this aftermath be explored.

In connection with returning the vines to the soil, we would point out that this practice spreads weeds and that the resultant action on following crops is such that it is difficult for canneries or processors to determine just when the crop should be harvested.

Experiments on the return of pea vines to the land have been initiated on the S. C. Crow Pilot farm under the Northwest Regional Soil Erosion Control Project. We recommend that this research work be continued.

The following recommendations are submitted from the pea sub-committee of the Blue Mountain Horticultural Society which met the forepart of February 1952, at Milton-Freewater, Oregon:

"We recommend that research be conducted on the culture of barley preceding peas, particularly in relation to the behavior of peas following barley versus peas following wheat. Fertilizer experimental work on peas for processing should be continued and expanded.

"Other research needed includes the possibility of making alcohol out of pea vines and chemurgy of waste pea vines."

One processor has asked the question: "Can a method be found for delaying maturity of peas in the field?" Possibly by growth regulators?

### **Rhubarb**

Rhubarb plantings have remained steady at about 200 acres for several years. The climate here is excellent, and facilities are available for processing larger acreages, but the market is definitely limited. There may be a long-time trend toward an increase in quick-frozen rhubarb, but the demand for the product cannot be expected to result in any major source of income.

There is a need for a heavier yielding, better colored type of rhubarb than is now available.

### **Spinach**

In the five year period 1943 through 1947, over 1,000 acres of spinach were planted annually in Oregon, largely in Multnomah, Marion, Lane, and Linn counties. Over half of the acreage has been planted for processing.

In the last five years acreage has declined, due to unfavorable production factors. Preparation of seedbeds and planting are often hampered by wet weather in Willamette Valley; yet plantings must be made early to escape seed stalk formation. Weeds, insects, and downy mildew have also been problems. In eastern Oregon the curly top virus is destructive. The following needs, to improve the spinach picture, are thus:

- Varieties resistant to curly top and downy mildew. Varieties now being developed in California and by the United States Department of Agriculture for mildew resistance should be tested when they become available;
- Improved methods of weed control, and studies on cultural needs, such as fertilizer and lime, are needed;
- Possibilities of growing spinach in the Madras and Bend districts should be explored.



## Squash

Squash acreage has remained in the 1,000 to 1,200 acre range for at least the past ten years. This indicates we are growing what the fresh and processed product markets will absorb. As with several other vegetable crops, greater acreages could be grown if there were markets. Unit value of the crop is low, so that long distance shipment of processed squash cannot be expected to be profitable. The future may see modest expansion due to increased population demands.

The *sclerotinia* fungus in western Oregon, and curly top virus in eastern Oregon are destructive diseases, with curly top being the limiting factor in production of most varieties of squash.

## Tomato

Oregon's tomato acreage for the past twelve years has fluctuated between 1,000 to 2,000 acres. In recent years about 2/3 of the acreage has been grown for fresh market, and 1/3 for processing.

From 300 to 400 acres have generally been grown in Umatilla County (Milton-Freewater), largely for fresh market shipments, and a slightly smaller acreage in the Ashland area, largely for processing. Willamette Valley plantings usually approach 1,000 acres, and are scattered throughout the area, primarily for fresh market, but with part of the 200 to 400 acres in Linn County grown for processing.

There is continued interest in eastern Oregon in canning tomatoes, but until a curly top resistant variety is developed, such operations will be hazardous. Such a variety would also benefit many growers in the Milton-Freewater area, who depend upon fresh market tomatoes as a major source of income.

In the Willamette Valley area, earlier varieties of high quality are needed. Near Ashland, a variety slightly earlier than Wasatch, and with good foliage cover, is desired.

The Experiment Stations of Utah, Idaho, and Washington are working on curly top resistance, but it may be several years before commercial resistant types become available. The problem has been extremely difficult to solve.

Competition with other areas is keen—in both fresh and processed tomatoes—so that future appreciable expansion is not expected here, unless unforeseen adverse factors develop for California's acreages. However, many market gardeners will be expected to continue to grow tomatoes in Oregon, and with better adapted varieties limited processing of the crop may continue.

The following recommendations were made by growers in northeastern Oregon.

- Development of an early tomato variety of good shipping quality.
- Improved cultural practices:  
More information on commercial fertilizers, their placement time of application and rates is needed.  
More information on soil management and the importance of the use of residues of other crops from adjoining acreage such as peas would be desired.  
The mechanics of field "lay out" need study if losses amounting to 1/4 the crop are to be overcome. (At times as much as 1/4 of the tomato crop lays in the ditches and is ruined by the irrigation water.)
- With the location of the pea canneries in the Milton-Freewater District and the desire of the management of these canneries to develop other crops which they can process during seasons other than the pea season, there should be possibilities of a tomato canning project here. In order to do this a high yielding tomato adapted to canning in this area needs to be developed.

If a canning tomato project is to be undertaken it probably would have to be developed on the lighter more silty or loam type soils. For one thing, fresh market tomatoes on the cobbly or gravelly soils cost too much to raise for canning purposes.

- Earliness, resistance to fusarium and verticillium wilts, and good foliage cover is needed in a variety for the Ashland area and Willamette Valley.
- For intelligent planning of fresh market acreage in the Milton-Freewater area, a careful comparative study of the economics of competing areas is needed.

### Watermelons

About 500 to 600 acres per year were planted to watermelons for several years prior to 1947. Since then, acreage has been cut roughly in half. Morrow and Umatilla counties have accounted for most of this acreage. Heavy shipment of California melons to Oregon has offered serious competition, with market operations being patterned by early shipments from that state. It is difficult for Oregon melons to break into these established market channels, unless they have outstanding quality characteristics.

It is unlikely that there will be a change in the watermelon outlook. Local market gardeners may have limited opportunity for increasing sales through production of high quality melons for roadside markets.

### **Turnips and rutabagas**

Most of the turnips and rutabagas are grown in Multnomah or nearby counties. Plantings have been steady at from 475 to 600 acres each year for the past several years. The climate is excellent, but the market is limited. No appreciable change in acreage is foreseen.

The most troublesome problems have been the control of cabbage maggots and flea beetles.

# Specialty Crops Committee

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## Register of Those Attending the Specialty Crops Forum, March 27, 28, 1952

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