

Oregon's Capacity to Produce

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By

M. L. UPCHURCH

Introduction

OREGON has about 61 million acres of land. This land with its soil and physical climate supplies the primary source of wealth for the people of the state. Oregon's farms, forests, water power, minerals, and fish furnish a living, directly or indirectly, for most of her population. The extent to which these resources can be used profitably determines the economic progress of her people.

Oregon is fortunate in that her major basic resources are not destroyed with use—if they are properly managed. The farms will produce indefinitely—if erosion and soil depletion are controlled. The forests will continue to grow trees with proper care; the water will continue to flow to create power. These resources are not consumed with daily use as are mines and oil fields.

A longer view of productive capacity

During the war years when maximum farm production was needed to feed and supply the armed services, extensive surveys were made to estimate the production capacity of our farms and ranches. These surveys considered changes that were feasible under the handicaps imposed by wartime economy. Now a longer view can be taken.

The productive capacity of the farming industry is determined by the amount and quality of land together with the manpower, capital equipment, technical knowledge, and managerial skill applied to that land. If unlimited labor and capital were used, then any given area of land could be made to produce almost limitlessly. But practical limitations do occur between the economic factors of labor and capital and the physical factor of land. To be of value, any study of the productive capacity of the farms and ranches of the state must assume that no material increases in the relative per unit costs of production will be made. This study is based upon this assumption.

Opposing points of view

Claims are made that the Pacific Northwest is a land of limitless opportunity and that untold numbers of new families can find opportunities for developing profitable farms. In contrast, it is also contended that this state has reached the peak of its agricultural development, that no new farming opportunities exist, and that any increase

in farm population would only add to an already disproportionate man-land ratio.

An objective appraisal of the agricultural resources of the state, the present uses made of them, and the probable future developments are needed to determine just how well developed the agricultural industry really is.

Physical Factors in Land Use

Physical factors set the outside limits of land use. Temperature and length of the growing season place definite limitations upon the kind and amount of farm crops that can be grown. The amount, seasonal distribution, and character of precipitation places additional limits. In some areas winds impose still further limits and finally topography and soils set the boundaries of agricultural use. In other words, these physical phenomena that make up the character of any particular piece of land are the factors that determine whether land can be used for farming purposes and, if so, the kind of crops which may be grown.

Economic Factors in Land Use

Within the boundaries set by the physical factors, economic forces operate. Sometimes these are sufficiently strong to change the boundaries of the physical. For example, temperatures and growing seasons are regulated by greenhouses, if the value of the crop justifies. Lack of rain can be overcome with irrigation, wind damage can be lessened with windbreaks, and soils can be fertilized and steep slopes terraced. Agricultural uses of land are seldom determined by physical conditions alone even when modified by man's efforts.

What is grown depends on man

While these physical factors determine what *can* be grown, what actually is grown depends on man; on what man needs; on what he knows how to produce; and on what he has the time and capital to produce. This is especially true since nearly all of our land is physically capable of growing a very great variety of things. The choice is largely a matter of relative need. When a farmer plants a garden he does not plant the entire garden to the one vegetable he thinks will do best. On the contrary, he plants the variety of things he needs to feed his family. He leaves out only those varieties that will not thrive under his conditions well enough to justify his efforts to grow them.

In our larger economy, the producer does not see the need, but he does estimate price and costs in order to decide whether it will

"pay" to produce a particular crop. In this case the price the consumer is willing to pay is his way of telling the producer what he wants and how badly he wants it.

Wheat *can* be grown on almost all the arable land in Oregon, but we *choose* to grow wheat on only about one-fifth of the arable acreage because other uses are more profitable on the other four-fifths. We must grow something besides wheat to fulfill the market demands of the consumers. We must have meat and milk, vegetables and fruits, and a wide variety of other products from the land. The demand for a variety of farm products results in a relative scale of prices which, in turn, causes them to be produced on land where they have a relative economic advantage.

Prevailing cost-price relationship is crucial

These broadly stated principles have determined the extent of agricultural land uses in Oregon in the past and will continue to determine it in the future. The crux of the analysis lies in the cost-price relationship that prevails for any particular crop at any particular time. The Oregon farmer knows with some certainty the sort of crops his land will produce. He knows with a good deal less certainty the type of crops and the combination of crops that will return him the most profit.

We say that Sherman County is better adapted to wheat than to any other crop, yet that is true only in light of the comparative prices of wheat and of other crops. If barley prices were 50 per cent higher than wheat prices, Sherman County would be a great barley county, and we might say that it is not adapted to wheat.

Land Available for Agriculture

Roughly 50 million of Oregon's 61 million acres are used for some agricultural purpose. This acreage represents about the total area that can be so used. The other 11 million acres are the stony waste lands of the high mountains, other waste areas, the Douglas-fir forests of western Oregon which have no agricultural value, water surfaces, and urban areas. Therefore, Oregon farmers of the future must use land now controlled and used, at least in some degree, by farmers and ranchers of today. Future changes must be in the nature of intensifying the use of existing farm and grazing land or by substituting one agricultural use for another.

Oregon's cropland

At the present time, farms in Oregon are made up of about 450 thousand acres of tilled crops, 1,750 thousand acres of drilled crops,

850 thousand acres of hay, 900 thousand acres of seed crops and cropland pasture, and 975 thousand acres of summer fallow and idle land. This makes a total of just under 5 million acres of land that is farmed, or rather is available for use as cropland. These figures are only estimates. Exact figures are impossible to obtain because sharp definitions cannot be drawn between uses made of land in actual practice. The 1945 census of agriculture lists the cropland of the state as 4,909,101 acres.

The development of cropland, or improved land, kept pace with the increasing number of farms in Oregon from the time of first settlement until about 1920. For the last quarter-century, however, the acreage of improved land has remained virtually unchanged. Some new lands have been improved and brought into cultivation, but, at the same time, some land has been abandoned resulting in little net gain or loss of total acreage. These figures indicate and farming experience in the state bears out the conclusion that acreage used for crops during the past 25 years will not change very much in the next 25 years. Even the small increases in acreage resulting from irrigation or drainage may be offset by withdrawals of submarginal areas.

This 5 million acres of cropland is the principal agricultural land resource of the state, and it is on this land that virtually all of the future agricultural development must occur.

Oregon's grazing land

In addition to crop acreage, Oregon farms contain about 14.4 million acres of land used for grazing and Oregon farmers and ranchers use another 31 million acres for grazing that is not in farms. This 31 million acres includes national forests and other public lands used under permit or lease, together with land owned by lumber companies and other non-farmer owners. The total grazing land acreage varies a great deal in its productive capacity. This capacity can be improved for the area as a whole if economic conditions justify the expense required or as research develops cheaper methods of improvement. This subject will be discussed in more detail later, but for the moment it is important to reiterate that the land area available for grazing use is relatively fixed. At the most Oregon agriculture has at its disposal about 5 million acres for cropping and about 45 million acres for grazing.

Reclamation by irrigation

Throughout the arid portions of the West, agricultural development has been closely allied with irrigation development. The most easily built projects were developed first by private enterprise and

largely for the purpose of providing supplemental feed for range livestock. Later projects were more costly, affected more people, and frequently were built to provide power and other services as well as irrigation water. Such projects were outside the ambit of private enterprise and were built by the Federal Government. Being governmental projects, the rapidity with which they were developed and their character and magnitude were dependent on the will of Congress rather than on economic forces alone.

A rather extensive survey of the potential irrigation development in the state has been made by the Bureau of Reclamation and the results published in a report submitted to the Secretary of the Interior in February 1947. This report recommends the early development of three irrigation projects in Oregon—Canby Project, Crooked River Project, and Bully Creek Extension of the Vale Project. These projects would provide water for about 15,000 acres of land not now irrigated and would provide supplemental water for about 10,000 acres of land on the Crooked River. Completion of McNary Dam, now under construction, will make possible the irrigation of something over 36,000 acres of land. Just how much of this land will come into use and how fast it will be developed is difficult to predict. These projects, together with the completion of the north unit of the Deschutes Project, represent the total irrigation development now planned in any detail for Oregon.

Rapid expansion of irrigation in the Willamette Valley and the coastal areas within the last few years has been an important factor in the agriculture of the region. In the Willamette Valley, irrigation has made possible the production of new vegetables crops and dairy pastures. In the coastal areas, irrigation has brought about a volume of dairy production not previously obtainable. This development has been made largely by individual farmers who built their own irrigation systems. Further development is likely to be of the same character. Land and water supplies suitable for such development are limited, but with the completion of currently authorized flood control and power reservoirs, water supplies will be adequate for the streams affected.

Irrigation development in the future for Oregon as elsewhere depends to a large extent upon who pays the cost. If the farmer who operates the land must pay the total cost of irrigation, then little additional development will likely occur for a long, long time. On the other hand, if a large part of the costs are paid by power users and the public, in the case of multiple-purpose projects, then potential irrigation development in Oregon may eventually approach a half million acres.

Reclamation by drainage

Irrigation and drainage development go hand in hand in many areas and the productivity of much of the present, as well as the potential irrigated land, could be increased by adequate drainage. Also, the productivity of much nonirrigated land, particularly in the Willamette Valley and coastal areas, could be increased with proper drainage. Various estimates of the acreage involved have been made, but probably about 700,000 acres of farm land in Oregon suffer from impaired drainage.¹ About 600,000 acres of this is in the Willamette Valley with an additional 50,000 acres in eastern Oregon and 50,000 acres in the coastal areas.

Roughly about two-thirds of this acreage can be drained by individual farmers working on their own farms while the other third requires major projects to clean stream channels and to provide community outlet ditches.

Drainage will bring into production relatively little new farm land, but it may greatly increase the productivity of much land already in agricultural use. This is particularly true for the Willamette Valley where much of the poorly drained land is used only for pasture, or produces low yields of extensive crops. If it were properly drained, it would produce a greatly increased variety of crops and generally higher yields. Prices for the crops to be grown and the costs of drainage will affect the amount of land drained, but much additional drainage seems feasible under existing conditions.

Relatively little good farm land remains to be cleared in Oregon. A few scattered tracts of as much as 100 acres in a place can be found in the Willamette Valley and in the valleys of the coastal streams, but they probably will total not more than 10,000 acres altogether. In addition, however, a great many farms have a few acres of land in the process of being cleared or that can be cleared to provide additional cropland. Perhaps an additional 5,000 acres could be added to the cropland of the state in this manner.

Along the flood plain of the Willamette River and in a few places elsewhere some potentially good farm land is still in timber. The regularity and severity of the floods have prevented such lands from being cleared. If the long-time flood control program now being developed for the Willamette Basin is effective in protecting such lands from overflow, much of it will be brought into cultivation because it is good land. No data exist on which to estimate the acreage.

¹"An Analysis of Oregon Agriculture," Oregon Agricultural Series No. 1, Oregon State College, 1946, p. 4.

An inventory of agricultural resources

By way of summary of the preceding paragraphs it may be concluded that the agriculture of the future must use land already used and controlled by the farmers and ranchers of Oregon. Greater agricultural income and increased employment of people in agriculture must come through more intensive use of the resources now employed. Irrigation projects under construction or in sight for the future may add up to 50,000 to 65,000 acres of new cropland. Far more important is the irrigation development that will provide supplemental water for land now farmed so that a more intensive use and greater yields may be obtained. Drainage will bring into use relatively little new land, but will increase the productivity of an estimated 700 thousand acres. Land clearing may add from 10,000 to 15,000 acres of new cropland, most of which is now in existing farms. In percentages, these acreages add little to the nearly 5 million acres of improved land now being used.

Abandonment of some of our present crop land may offset these small increases in acreage. Particularly in the Columbia Basin, many thousand acres now in crops are seriously affected by erosion or are near the margin because of rainfall or other factors. A few adverse years of weather or prices would cause more cropland to go out of production than is expected to be brought into production.

Effect of fertilizers

No consideration of the production capacity of the agriculture of the state would be complete without including the effect of increased use of fertilizers. Considerable increase in production could be obtained through wider use of lime, nitrogen, phosphorus, potassium, and sulphur. Soils of western Oregon generally respond to lime and an estimated 168,000 tons should be used annually to maintain maximum yields. Nearly 2 million acres of Oregon's cropland will respond to mineral fertilizers requiring for maximum yields, an estimated 15,285 tons of nitrogen, 27,430 tons of phosphoric acid, 2,230 tons of potash, and 11,280 tons of sulphur. As the soils of the state become older through use and as the proportion of intensive crops increases, the use of supplemental fertilizers becomes even more important.

Of course, the use of fertilizers is a matter of costs and returns, but slight changes in fertilizer prices or in crop prices could produce very large changes in the use of fertilizers. In fact, it appears that a much more extensive use of fertilizers is justified under existing price relationships, and that this more extensive use will come as the possibilities are more widely known.

Trends in Major Land Uses

Agricultural development in Oregon followed a rather steady pattern from the beginning of settlement up to about 1920. Toward the end of World War I most of the cropland available to the state was in use and the total acreage of cropland has changed very little since that time. Following the first war, however, population of the state increased sharply, the number of farms continued to increase, the development of mechanization and economic factors generally set in motion some rather significant changes in the use of cropland.

The increase in specialty crops

Most important of these changes has been the increase in specialty crops. In 1919 only a little over 5 per cent of the cropland was used for tree fruits and nuts, small fruits, potatoes and truck crops, and other specialties including forage seed crops. At the present time nearly 16 per cent of the cropland is so used.

Another important change has been a rather sharp decrease in the amount of fallow and idle land, a decrease of from about 30 per cent to about 20 per cent of the cropland of the state. Most of this decrease has occurred since 1940 and probably can be accounted for by the fact that better than average rainfall has been received in the dry-land farming areas and better than average prices have prevailed for wheat and other grains. At the same time a slight increase has occurred in the percentage of land used for grain crops. Whether these changes are a temporary result of wartime prices and favorable weather, or whether they are permanent trends in the use of land cannot be established at the present time. Probably the acreage of fallow land has now been reduced below that required for sound farming practice. But a few dry years, with or without some low prices, doubtless would necessitate an increase in the fallow acreage to about that considered normal—around 30 per cent of the total crop acreage.

Cropland in hay production

In spite of the increase in specialty intensive crops, the decrease in fallow and idle land, and the slight increase in grain crops, the percentage of cropland in the state devoted to hay production has remained virtually unchanged since the end of World War I. Roughly one-fourth of the cropland consistently has been used for hay. This hay is all fed to Oregon livestock and hay production cannot be changed without corresponding changes in our livestock program.

The Outlook for Oregon Land Use

The grazing land of Oregon is an important factor in the agriculture of the state. Not only is the area used for grazing relatively fixed, but the productiveness of the grazing land determines the amount of cropland devoted to hay production. Some 45 million acres of the state have no practical alternative agricultural use except as grazing for sheep or cattle. The stock grazed must have other feed during most of the winter. Therefore, at least a sufficient acreage of cropland must be devoted to feed production to winter the range stock or the range land itself will remain unused.

Land used for grazing varies tremendously in the forage produced, and in the methods of management. To discuss in detail the outlook for increased productiveness for each type of range land would be beyond the scope of this bulletin.

Factors affecting range land production

Several major trends will influence range land production in the future:

- ▶ The development of grasses and sage eradication for the semi-arid regions.
- ▶ Declining productivity and increased competition for the use of the land in the summer range areas.
- ▶ Development of grasses and management techniques for grazing areas in western Oregon.

Oregon has vast areas of sagebrush land used primarily as spring, fall, and winter range. The extent of such land is about 15 million acres. Most of it is located in the southeastern quarter of the state. Carrying capacity of such land varies widely, but for the type as a whole about 10 acres is required per animal unit month of grazing. Such land provides about one-third of the total range feed produced in the state. Experiments with this type of range land in southern Idaho, Utah, and elsewhere indicate that its productivity can be increased by a program of sage eradication and, where necessary, by seeding of suitable varieties of grasses.

Sage eradication

Several methods of sage eradication have been used successfully including burning, plowing with wheat land plows, raiing, harrowing with a self-cleaning harrow, rolling with a spike-toothed roller, and scraping with road equipment. Experiments to date do not indicate any one method best under all conditions. Costs range from a few cents an acre for burning up to about \$5 an acre for plowing. Seeding the areas cleared of sage generally is necessary

unless a good stand of desirable native plants exist and can be saved during the clearing process. Several varieties of grass have been used for seeding semi-arid ranges with promising results including crested wheatgrass, slender wheatgrass, smooth brome, and mountain brome. Forest Service experiments indicate that range improvement of this sort is suitable only to the better soil areas with slopes of under 30 per cent.²

Productivity of semi-arid range land is relatively low even under the most favorable conditions, therefore, little expense per acre for improvement can be justified under private management. Roughly two-thirds of the range land of this type, however, is in public ownership. Expenditures for improving this type of range may be justified in local areas beyond that warranted by increased productivity alone, if such improvement results in better distribution of use between seasonal ranges.

Grazing on public lands

For many years the carrying capacity of the mountain summer ranges in Oregon has been declining steadily (Table 1). About two-thirds of the acreage of this type of range is in national forests. Since this land is public land managed by the Forest Service, the interests of the public at large determine management policies. Grazing is only one of many uses to which such land is put. Timber production, recreation, wild life production, and other public uses share with livestock grazing the productivity of such land. With the growth of population and the increasing public demand for timber and for recreational facilities, it is reasonable to expect that grazing will have a decreasing place in the national forests.

Table 1. LIVESTOCK GRAZING ON NATIONAL FORESTS IN OREGON, 1924-46

Year	Number of head ¹		Unit months of grazing	
	Grazed	Capacity	Grazed	Capacity
1924	263,843	308,760	1,407,022	1,496,036
1929	223,018	259,491	849,650	1,209,695
1934	211,446	210,341	889,714	924,616
1939	161,406	159,447	637,528	651,076
1944	132,991	144,313	517,964	603,074
1946	123,380	133,944	477,850	570,963

¹Data from the National Forest Service, total number of head obtained by adding the number of cattle and horses plus one-fifth of the number of sheep and goats.

Many factors have contributed to the decline in the carrying capacity of national forest lands. Excluding fire, the most important of these factors probably is that trees and brush are crowding grass

²Pechanac, "Sagebrush Burning—Good and Bad," U. S. Department of Agriculture Farmers Bul. No. 1948, Jan. 1944.

off the land. The number of deer and elk have increased tremendously in the last three decades. These animals, particularly the elk, compete with sheep and cattle for available feed on the summer ranges. Regardless of the reason, the fact remains that the carrying capacity of the summer ranges for domestic animals has declined. The public demand to use public lands for purposes other than grazing likely will increase rather than lessen.

Although a decline in the use and capacity of national forest lands in eastern Oregon has occurred, productivity of other range and hay lands east of the Cascades has increased, thus keeping the number of livestock in that region about constant for the last half century. The amount of feed produced on range lands varies from year to year in response to weather conditions, but for the region as a whole the number of livestock that can be supported year in and year out on the ranges of the eastern half of the state has remained and likely will remain at about the present number. Wide shifts may be made between cattle and sheep, but the number of animal units cannot change very much.

Overgrazing overshadows improvements

The rather wide-spread publicity that is given to the overgrazing of certain areas has caused us to overlook the little improvements made here and there by thousands of farmers and stockmen. These many small improvements are difficult to measure statistically, but we do know that the total number of beef cattle and sheep (figuring five sheep to one head of cattle) has held quite steady for a half century, and that the quality and condition of the animals has improved.

Productivity of pastures in western Oregon may be increased because of greatly improved varieties and types of grasses and clovers that have become available within the past few years. Wider use of these new plants could increase the productivity of nonirrigated farm pastures substantially, and will do so as rapidly as their merits are known. In the Willamette Valley, irrigation of dairy pastures more than doubles the amount of feed produced. About 80,000 acres of the steeper hill soils in the Willamette Valley now used for annual grain and hay crops could well be seeded to permanent pasture mixtures and probably a like acreage now in pastures could be improved. This 160,000 acres of improved pastures would permit a substantial increase in the number of dairy cattle and sheep in the Willamette Valley counties. It takes time and money, however, to develop good pastures and, so long as grain and hay prices are high, farmers are slow to make such changes even though they may be desirable in the long run.

Development of cut-over land

The development and use of cut-over land offers the greatest opportunity for expansion of range acreage. Much experimental work has been done to determine the most suitable forage grasses, the best methods of getting such grasses established, and the best management practices to use on cut-over land. A great deal of practical experience also has been gained by farmers and ranchers in the coast range region. As a result of this experience and study, the possibilities and limitations of using this type of land for range livestock are now reasonably well known.

One of the chief obstacles to the use of cut-over land for grazing in the past has been the restriction put on the use of fire for land clearing and seed bed preparation. The Oregon legislature in 1937 passed an act that permitted the classification of forest land into three types: (1) that suitable for livestock grazing, (2) that suitable for joint use for grazing and for forestry, and (3) that suitable for forest use.

To date, about 1,200,000 acres have been classified under this law, of which 381,000 acres have been classed as suitable for livestock grazing. In the areas so designated, the forest fire laws are administered so as to promote such development. Pursuant to this law, the State Forester has established a policy of cooperation in the development of suitable range land in cut-over areas. In all, about 500,000 acres of cut-over land could be developed eventually for grazing use in western Oregon. Probably not over one-tenth of that acreage, however, will be developed in the next few years.

Although fire regulations are no longer a major problem, other obstacles will make such expansion of the range business slow at best. Speculative timber values on cut-over land make many land owners reluctant to carry out range improvement investments at the present time.

Cut-over land suitable for livestock operations is commonly owned in small tracts. The prospective stockman must, therefore, buy several tracts, probably from several owners. Such piecemeal purchasing is often difficult, if not impossible.

High costs of labor, seed, fencing, and other improvements have also been a retarding factor.

Adjustments in the use of cropland

It has been pointed out that the 5 million acres of cropland in Oregon are rather well fixed by nature and that the changes we can make in the acreage is small. On the other hand, possibilities for

changes in the use of much of this land are very great. These possibilities are not the same for all parts of the state.

Oregon's cropland varies from sea level to 5,000 feet, from areas with 120 inches of rainfall annually to 10 inches or less, from soils of great natural fertility to soils that must be modified materially with fertilizers before satisfactory yields can be obtained. No general statements can be made that will hold true for the state as a whole except that nearly all the cropland available to the state is now being farmed. Development in the future will be largely a matter of substitution among crops, rather than bringing into production new acres.

In the Willamette Valley, the Umpqua Valley, the Rogue Valley, and in the irrigated sections of eastern Oregon at the lower elevations, virtually all crops suited to the intermediate zones can be grown successfully. Some crops that border on the subtropical can even be grown in these areas. On the other hand, the dry-land areas of eastern Oregon and the irrigated areas at higher elevations are more limited in the kinds of crops that can be grown.

The largest acreage of any-one type of cropland in the state is in the Columbia Basin where wheat predominates. During recent years, about 800 thousand acres of wheat have been grown in this area with approximately the same acreage of idle or fallow land. The possibilities for substitution of crops in this area varies roughly with the rainfall. In the more humid sections, peas, sweet clover, and alfalfa offer some alternatives to wheat in proper rotations. In the drier sections of the Columbia Basin, barley or rye may be substituted for wheat, but as long as the price of wheat is on a food basis rather than a feed basis, no advantage is gained by growing any other small grains.

Substituting grass for wheat on marginal land

Crested wheat grass is a possible substitute for wheat on marginal or near marginal land. In years of good rainfall and high prices, much of the low-yielding wheat land is definitely profitable and valuable in wheat, but in years of low prices and/or little rain, much of it would be better in grass. Until some good method is found for making substitutions on this type of land, it will likely continue to be used for wheat with large scale abandonment in years of low rainfall or low prices and large scale speculation in years of favorable moisture or favorable prices. Of course, the wheat acreage could be expanded in other parts of the state because almost every acre of farming land in Oregon will grow good wheat. But such expansion of the wheat acreage would not be in line with good farm management.

The possibilities for changes in crops are greater in the Willamette Valley than in any other major farming section in the state. An extremely wide variety of crops are grown, many of them occupying only a small part of the land to which they are adapted. A study of soil types in the Valley indicates that about 270 thousand acres are suitable for nearly a hundred different intensive crops such as vegetables, small fruits, hops, and other specialty products. An additional 500 thousand acres are suitable for limited production of specialty products depending on local soil, management, and market conditions.

Unlimited land can be devoted to specialty crops

The amount of land suitable for production of most of Oregon's specialty crops is not a limiting factor. We have more land suitable for their production than we are likely to need for a long time. Without resorting to inferior land, production of many specialty crops could be stepped up if market conditions justified the increase. Winter pears and certain types of apples are the only horticultural crops that occupy any large percentage of the suitable land. The mild winters of western Oregon are especially favorable for nursery crops. Plants may be dug any day and shipments timed to meet the needs of buyers in any part of the United States. Nursery crops, however, use very small acreages. Increased production of specialties, including horticultural and vegetable crops, therefore offer the greatest field for change in Oregon agriculture. Again, we should note that land suitable for such crops is not now idle, but its use can be shifted as conditions of supply and demand warrant.

Dairy production could be greatly expanded

Dairying is the most important single farm enterprise in the Willamette Valley, but physically, dairy production has by no means been expanded to its limits. As has been mentioned, greatly increased production of pastures is possible. Along with pastures, greatly increased production and quality of roughage is also possible. With greater use of irrigation on dairy pastures, with greater use of ensiling and drying of hay crops, and with a shift from forage seed production to hay production, the amount of dairy products in the Willamette Valley could readily be doubled. Increased in-shipments of grain feeds would have to accompany such an expansion.

In addition to possibilities of expansion with existing dairy farms, there are thousands of farms in Oregon not now in dairying that would undoubtedly go to dairying if the prices of dairy products should remain high as the prices of other things decline. Dairying could be expanded by about 50 per cent in this way. But there would be a corresponding reduction in other agricultural enterprises.

Hog production is a matter of crop use rather than land use. Oregon could easily grow four times as many hogs without materially changing her cropping system. It would merely be a matter of feeding wheat to hogs instead of selling it for milling purposes. But as long as the public will pay more for wheat for milling than it will pay for the hogs that can be grown on that wheat, hog production will be limited to the utilization of waste products of the dairies, farms, and kitchens.

Crop substitution in eastern Oregon

The lower irrigated areas of eastern Oregon can grow a wide choice of row crops ranging from field corn to vegetable seeds. The only physical limit to the acreage of such crops is that of maintaining soil fertility. Perhaps no more than one-fourth of the land in these areas should be devoted to intensive row crops, keeping the remainder in hay and clover or green manure crops. Irrigated areas at higher elevations are limited largely to hay and other feed crops for range livestock and in some areas to potatoes. Not only does the shortness of season limit the types of crops that can be grown, but the full use of range land demands adequate winter feed supplies.

Central Oregon

Late potatoes are an important crop in the high, irrigated areas of central Oregon. This potato acreage seems to be nearing its limit. If many more were grown, it would mean a less desirable rotation, or the use of less productive land.

The Rogue River Valley

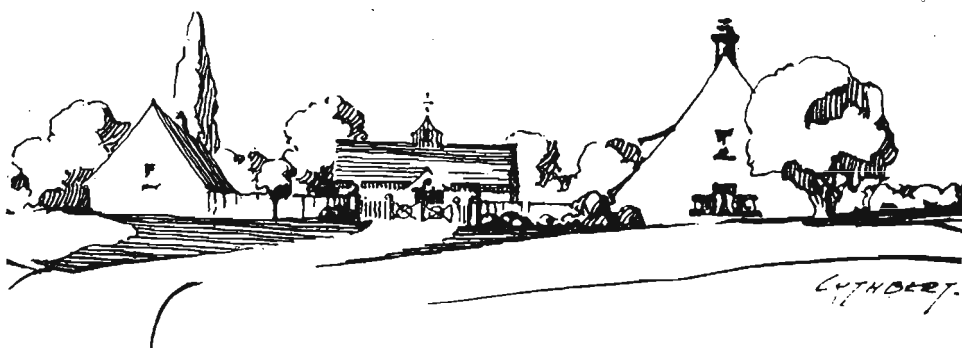
The cropland of the Rogue River Valley has attained a greater intensity of use than any other farming area of the state. About 30 per cent of the land is now irrigated and much of it is in intensive crops at the present time. Further expansion of irrigation is definitely limited by water supply.

Preliminary plans have been made for increased storage of irrigation water on the Rogue. Actual construction of this project is for some time in the future. It will not provide for any vast acreage of new irrigated land. It will, however, provide badly needed supplemental water for several thousand acres of land now irrigated or partially irrigated.

Limitations in the coastal valleys

The dairy sections of the coastal valleys also have relatively limited possibilities for change in agricultural production. Climatic conditions are such that pastures are the best use for most of the

land and dairy production is now close to the limit of pasturage. Nearly all land suitable for dairy pastures in these areas is now in use. Some increase is possible through wider use or irrigation for summer pastures and wider use of ensiling for surplus hay and grass crops. Limited acreages are available for specialty crops such as bulbs, nursery stock, and small fruits and berries, including cranberries. With increased population and increased tourist travel in the coastal areas, some expansion of vegetable production for local consumption may be justified. Ample acreage of suitable land for the production of these specialties is available in most sections of the coast region.



A Restatement

► In looking at the production capacity of Oregon agriculture, several factors stand out significantly. Most important of these is that relatively little new land can be brought into agricultural production in the state. Fifty to sixty thousand acres are in sight for irrigation development, probably ten thousand acres can be cleared of timber, a few thousand acres can be drained. In total, this is a small amount compared to the land now developed and used. On the other hand, some decreases in crop acres may occur, particularly in the Columbia Basin.

► We can do a great deal more intensive job of farming the land we now have. Less wasteful methods of irrigation can be followed that will permit more production from present water supplies. Wider use of fertilizers will increase production. Better drainage of present land areas will help greatly. Use of better seeds and better breeding stock will increase the efficiency of production. Definite progress is being made along all of these lines.

► Although little new land is to be developed, wide possibilities do exist for changes in Oregon's agriculture. Many areas of the state can produce a wide variety of products any one of which might be increased by wide margins but at the expense of other crops. The extent of wide changes in the future will depend upon other economic factors than availability of land.

► Although most land of the state could grow wheat, the area most likely to be used for wheat is fairly fixed. Some fluctuations do occur both on the drier margins and on the wetter margins of the wheat region, but the wheat region as a whole has few alternative crops.

► The number of range livestock that can be produced is relatively constant and is determined by the capacity of our grazing lands. Some increases are being made in western Oregon with the development of better pastures and the use of cut-over land.

► The irrigated areas at higher elevations have few alternatives. Production of late potatoes in such areas has now been expanded about as far as good soil management warrants. Other intensive crops have limited possibilities in such areas. Dairy production could be increased quite generally throughout the Willamette Valley and the irrigated areas, but such an increase would have to replace other enterprises. Specialty crops such as seeds, nursery crops, floral crops, together with most fruits, nuts, and vegetables now oc-

copy only a small part of the suitable acreage. With few exceptions, the expansion of such crops will be determined by economic conditions and not by the availability of suitable land.

► For the state as a whole, a balance must be maintained:

Between intensive crops and extensive crops.

Between soil conserving crops and soil depleting crops.

Between cash crops and livestock products.

If such a balance is not maintained, then the foundations of agriculture, the soil fertility, will be impaired. In a state like Oregon that can grow a great variety of things, the problem of maintaining a proper balance should not be difficult.

► Finally, it should be noted that the prosperity of the state does not depend upon mere change. It depends rather, upon our good judgment in keeping our agriculture adjusted to changing economic and other conditions and in making these adjustments at the proper time, neither too early nor too late.