

Report of the

WASHINGTON COUNTY AGRICULTURAL OUTLOOK CONFERENCE

Conducted In
HILLSBORO, OREGON
FEBRUARY 4 and 5
1936

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FOREWORD

The general committee of farmers whose names appear on the preceding page met at the county agent's office in Hillsboro early in November, 1935. At that time they discussed the agricultural conference held in January, 1925, and the report printed at that time. From that discussion they developed a unanimous decision that another such conference should be held.

This report is compiled from discussions and conclusions arrived at in committee meetings of farmers interested in the different agricultural enterprises of the county. All these committees met at least twice prior to the final two-day meeting. The first meeting of each committee being held in November at which time the scope of their work was determined, following which information was assembled for use at a second meeting held in January. At the final meetings on February 4 and 5, their data and information was presented to all the farmers interested in the different enterprises for their consideration and suggestions. This printed form represents the adopted ideas of these committees of farmers of Washington county.

The publication of this report was made possible through the cooperation and financing by the Washington County Court, Washington County Pomona Grange, Washington County Farmers' Union, Commercial-National Bank of Hillsboro, First National Bank of Forest Grove, and Hillsboro Branch, First National Bank. These concerns felt that the importance of this report to agriculture of this county warranted its publication.

WM. F. CYRUS, County Agent.

Report of the Agricultural Economics Committee of the Washington County Farm Outlook Committee

February 4 and 5, 1936

The agricultural economics committee considered five topics that are believed to be of considerable importance to the future welfare of Washington county agriculture. These topics are:

1. Farm credit
2. Land utilization
3. Farm organization
4. Marketing of agricultural products
5. The general agricultural situation and outlook

FARM CREDIT

This committee believes that Washington county farmers now have adequate facilities for both mortgage and production credit. Under present conditions the outstanding need in connection with marketing credit is additional government bonded warehousing facilities. This would make it possible for farmers to obtain additional money on crops on hand, which should promote more orderly marketing than they are able to do at the present time.

Like every other section some farmers in this county have made too liberal use of credit but there probably have been fewer cases of over-financing in this county than in most sections as is evidenced by the comparatively small number of mortgage foreclosures. In some cases, however, farm borrowers would have been financially ahead to have given title to their creditors, rented a new place and started over, for the total debt obligations have raised the carrying charge per acre to 50 and occasion-

ally even 100 per cent more than the annual rent on similar land. A heavy debt load frequently causes neglect of family health and home life, which consequently results in a lowering of the farm morale.

Generally it is desirable for a farmer to liquidate his present debts as rapidly as possible. There are times when his profits over and above payments due on an indebtedness may be or should be used for other purposes, but to buy his own debts is generally about as good a use as can be made of profits from the business.

Farm mortgage rates have tended downward the past few years and terms have been lengthened. It is believed that this tendency towards making loans for a longer period at comparatively low rates of interest is likely to continue for the next two or three years, after which the tendency will probably be upward, for as business recovery is more complete and there comes a more active call for money, interest charges will likely increase.

The wisdom of expanding the farm business on borrowed funds should be determined by the present financial status of the borrower. If the present debt load means only a reasonable charge against the farm business and if by expanding he can increase profitably the size of his business and his efficiency, it may be wise and justified.

In general the committee believes that credit can be legitimately used and that it will usually

pay a farmer to borrow money to do the following things:

1. Market his crop in a more orderly manner.
2. To increase his volume of business when this increase in business will reduce his unit costs.
3. To sometimes take advantage of cash discounts.

It may also be desirable at times for farmers to borrow money to purchase more productive livestock and sometimes for the purchase of machinery. In connection with these purchases a careful estimate should be made as to the amount of increased income that the better livestock will produce and how much saving the use of new machinery will effect or how much its use will reduce unit costs.

Regarding the repayment of mortgage loans it is believed that improvements could be made even beyond those embodied in the amortizing repayment plans now used by a few agencies. During periods of good prices farmers frequently fail to reduce their mortgage debt beyond the amount called for by the annual amortized payment even though able to do so. During periods of low prices or years of short crops they frequently have difficulty in meeting the amortized payments which are based on normal crops and prices. This committee believes that it would tend to reduce the mortgage debt more rapidly and improve the condition of the farmer if payments were based on a definite percentage of the gross or net farm income. It is recommended, therefore, that financial agencies give careful consideration to working out such a system of payment for long-time mortgages.

In purchasing a farm the new purchaser should have not less than

33 per cent of the purchase price plus enough additional cash to provide him with stock and equipment if he doesn't already have it and sufficient capital to provide his living expenses for at least one year.

About the only procedure for worthy young farmers with limited capital to follow in establishing themselves is to rent. This always involves the question of securing necessary equipment. However, by acquiring ownership of some livestock when a youngster and continuing to increase this the boy should, by the time he is old enough to have a farm, have at least a part of the needed equipment. The 4-H club activities are recommended as an incentive in this type of preparation.

Production credit association financing is available to this type of beginner as well as others. Young farmers starting in should adopt a program for establishing a good credit rating. The committee suggests attention to the following things in this connection.

First, establish production capacity by acquiring only good land and equipment. Build income upon production and credit upon income.

Second, build up reserve as security for the credit.

Third, follow a business policy that protects creditors by:

1. Living conservatively and avoiding consumption debt.
2. Keeping something free of mortgage for an emergency.
3. Protecting major risks, including life, with insurance.
4. Paying cash in order to secure the discount.

Fourth, develop improved business practices by:

1. Paying debts or making renewals on or before the date due.
2. Keeping records, especially inventories and cash accounts.
3. Making a credit statement to the lending agency.
4. Budgeting the requirements of the farm for supplies and credit in advance of the time of need.
5. Buy his own debts and save the interest on his own loans which is higher than what he can get safe outside investments.
6. Reduce the per cent of debt as age increases.
7. Make no outside investments while in debt.

In addition to these things, the committee believes the following might also be kept in mind.

1. Reduce the percentage of indebtedness as the size of the business grows.
2. Recognize that the contri-

LAND UTILIZATION

Washington county has a total area of 467,770 acres. Of this total 445,115 acres or 95.2 per cent is privately owned. Ownership of the land in the county is shown in the table below:

LAND OWNERSHIP IN WASHINGTON COUNTY

Privately Owned		Public Ownerships				Total area of County	
Percentage of Total acres		State	County	Municipal	Federal	Total	
(acres)	(per cent)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
445,115	95.2	0	8,765	360	13,530	22,655	467,770

Since the above table was compiled, approximately 16,000 additional acres have been foreclosed for taxes so the county lands now total 24,865 acres. The legality of this tax sale has been contested and exactly how much of these lands the county will retain title to is not known at the present time. Doubtless there will be a large number of tracts on which the title will not be contested.

On January 1, 1935 there was in Washington county 111,206 acres of privately owned land on which the taxes were delinquent for 1930 and prior years, but which had not yet been foreclosed. Much of this acreage will probably be foreclosed during the next few years so the acreage of land belonging to the county will probably continue to increase. Most of this increase will come through the acquisition of logged-off land. The greater part

of this land is unsuited to farm development under existing conditions. Its use at the present time is confined primarily to two purposes, namely: reforestation and grazing. Most of it, has at one time or another been burned, but practically none of it was ever seeded, consequently it does not have as much grass on it as there could be.

Leasing this logged over land in large tracts to private operators with the proviso that as it is burned it must be reseeded would seem to be a more desirable method of handling it than for the county to attempt to do it.

Before people are permitted to settle on this land for the purpose of developing it into farms it should be classified as to its adaptability for farming and unless areas can be found which are large enough to support several families

in one group, its use for settlers is questionable. Isolated farms sprinkled around over such logged-off areas involves the building of roads and the maintenance of schools which results in a relatively heavy public expense for only a very few patrons.

Of the total area of privately owned land in Washington county, 228,056 acres is in farms. From 1880 to 1900 there was an increase in the amount of land in farms, and

in 1900 the area in farms reached a peak of 251,568 acres. This area declined to 223,406 in 1920, rose to 234,798 acres in 1930, and decreased to 228,056 acres in 1935. Ever since 1880 the number of farms has increased steadily while both the total acres and improved acres per farm has decreased. The total acreage of land in farms, the amount of total and improved acres per farm, and the number of farms is shown on the following table:

AGRICULTURAL DEVELOPMENT OF WASHINGTON COUNTY, OREGON 1880-1935

Census	All land in farms		Improved land in farms			Av. size farms	
	Acres	Per cent of county Area	Acres	Per cent of farm land	No. of farms	Total Improved Acres	Improved Acres*
1880	171,840	36.7	61,627	35.9	785	219.0	78.5
1890	211,920	45.3	86,045	40.6	1,588	133.5	54.2
1900	251,568	53.8	92,512	36.8	2,302	109.3	40.2
1910	240,328	51.4	107,919	44.9	2,871	83.7	37.6
1920	223,406	47.8	121,325	54.3	3,090	72.3	39.3
1925	228,975	48.9	122,538	53.5	3,876	59.1	31.6
1930	234,798	50.2	130,092	55.4	3,917	59.9	33.2
1935	228,056	48.7	126,553	55.5	4,371	52.2	29.0

*Crop land and plowable pasture.

Source of Data: Compiled from Miscellaneous Joint Publication No. 1 by Pac. N. W. Forest Experiment Station, Portland, and Oregon Agricultural Experiment Station. All data based upon official census figures.

The handling of timber and logged-off land is of considerable interest to farmers. On timber lands logged and burned over without reseeded, the water run-off is rapid, consequently, the flood hazard along the streams in the valleys is naturally increased. Moreover, the stream flow in the summer time is less because the storage capacity of the soil has been decreased through removal of the forest with consequent depletion of organic material in the soil.

The decreased flow in some of the streams already has become noticeable according to many of the old timers who have observed this condition. The committee considers this a serious situation and

recommends that County officials seek the cooperation of Federal and State agencies in working out methods and finances for the prompt seeding to grasses of burned over land in order that floods may be controlled and the summer flow of streams sustained.

The committee believes that Washington county can accommodate additional farm families at the present time only in two ways:

First, as replacements to people who are now operating farms and want to get out.

Second, by sub-dividing some of the larger farms. In other words the number of new farm families in Washington county can ac-

tually be increased only by subdivision of the larger places.

This development is probably inevitable. From the standpoint of productivity the division of some large individual tracts would be desirable. On the other hand the large units in the hands of some operators are the best paying farms.

This committee recommends that newcomers to Oregon who wish to purchase a farm, rent or work for an established farmer for at least one year before investing their funds. By following this practice buyers should be able to obtain farms well suited to the type of farming they wish to follow. This practice should prevent losses which heretofore frequently occurred because buyers were not able to judge and correctly appraise the productive capacity of the farm they purchased.

Undeveloped land is not available for additional farms in Washington county except where such land is found on the larger farms which can be subdivided. The type of development needed on such land is mainly that of clearing but there are some tracts that need drainage.

A survey and classification of private and state and county holdings of logged over lands for the purpose of labeling those areas unsuited for farm development would be of some benefit in keeping people from attempting to develop them.

There are already a number of submarginal farms in Washington county located at the upper ends of small shoestring valley and on cut over lands. Unless action is taken to prevent settlement, the creation of additional farms of this character is likely.

A land-classification program would aid in solving the Washington county land use problems. Settlement on submarginal land will be controlled only when such areas are officially determined, mapped

and designated and the county is given authority to zone out new settlement. Restriction of settlement on isolated cut-over lands and shoestring valley areas should save the county considerable school and road expense. In addition to the cut over and shoestring valley areas there are some other farms which are submarginal because of their size. These farms are often well located and have good soil but are so small they can only be successful as part time propositions where the owners have some employment outside the farm to provide some income to aid in supporting their family.

From the farmer's standpoint additional part-time farms are, not desirable. This committee believes that probably it is an advantage to an industrial worker or an office employee in the city to have a small farm or rather an acreage. The committee believes that in many cases the area that this class of workers has tried to operate has been too much. We believe that if the so-called part-time farms comprised a half acre to two acres that it would be more desirable for such owners and that such places would be much better operated than the average part-time farm of five to 20 acres. Generally a part-time farm should not be larger than what can be effectively handled by the family without horse or machine labor, except possibly at plow time.

The number of farms in the Willamette valley should not be materially increased until there is an expansion in industry and a consequent expansion of local markets. There are some crops which we can grow here better than they can be grown anywhere else, and for which ready markets exist outside of the state. These can be developed, but it should be borne in mind that some of these crops are more economically produced on large farms than on small ones and that the present tendency in the Willamette valley is for a decreased

size of farm. This committee believes:

1. That replacement of operators on some farms is desirable.

2. That subdivision of some farms would probably increase the total earnings of these tracts of land.

3. That we need to give attention to improved methods of operating the land already in farms so that this may be as profitable as possible, and

4. That the expansion in the number of farms and the land development will naturally follow the expansion of industry in the state and in Washington county.

FARM ORGANIZATION

There are six principal soil types in Washington county. In acreages they rank as follows:

Willamette.
Melbourne.
Olympic.
Amity.
Wapato.
Chehalis.

In this county the soil type does not definitely determine the type of farming. Most of the tree and small fruits, walnuts, and potatoes are grown on the Melbourne and Olympic soils. There is also considerable general farming on these two soil types. The Wapato soil type is practically all found along the Tualatin river or tributary bottom land that overflows. This soil type is almost altogether a spring crop farming proposition.

In attempting to arrive at the minimum size of farm which constitutes an economic farm unit it is necessary to take into consideration the type of farming that is to be done. Some of the commodity committees participating in this conference have recommended minimum economic units for the production of their commodity. This committee will therefore concern itself only with recommendations that pertain to general farms. The

greater part of the general farming of the county is carried on on two soil types, namely; the Willamette and Amity soil series. These two series make up the greater part of the main valley floor. A general farm on these soil types usually consists of a few cows, enough acres of hay and silage corn for feed and grain for feed and seed. Some cash crops of seed, hay, grain and sometimes potatoes are also common. This committee believes that a minimum farm unit under such conditions would be 40 acres of cultivated land, and that an economic dairy unit on such a farm would be 10 cows.

The average farm in Washington county, according to the 1935 census, contains 52 acres of which 29 is under cultivation. Considering this as an average and the recommendation just previously made, it would indicate that we need to increase the amount of cultivated land per farm. It should be borne in mind, however, that there are a large number of small places in Washington county, particularly in the eastern part of the county, which the census classifies as farms and that these reduce the average size. On these small places the size of the unit needs to be increased if it is to be a full time proposition. At the same time on practically all farms with less than 40 acres of tillable land and even up to twice that, farming needs to be more intensive.

This committee believes that for an average farm family to maintain a satisfactory standard of living, pay taxes and operating costs, the farm should with normal prices, yield a gross income of approximately not less than \$1800 annually. The amount of mortgage indebtedness has a bearing upon the amount of gross income needed. As the mortgage indebtedness increases, the amount of the gross income needed increases by the amount necessary to meet increased interest and amortization payments.

Reasonable diversification is de-

strable for the average farm in Washington county but there is danger of too much diversification. Diversification can be carried to the point where there are so many things produced that there is an insufficient volume of any one thing to make economic marketing possible. If diversification is carried only far enough to make possible a proper crop rotation system, efficient use of equipment and in the case of cash crops a production volume that can be efficiently marketed such diversification should improve farm income and give stability to the farming operation. Probably the principal objection to diversified farming is that it is frequently difficult to find a farmer who is a good dairyman, a good seed grower, a good truck crop man or a good potato grower all in one. Consequently, too frequently we find that in diversified farming a farmer produces a high quality product in one line while he is producing mediocre products in other lines.

Farming methods in Washington county are generally conducive to the maintenance of soil fertility but there is ample room for improvement in individual cases. More care needs to be taken with the hill soils to prevent erosion. This means more consistent rotation and the use of legume crops. On some farms more stock should be kept with more crops being fed to this stock. Also there are some crop residues not used to advantage.

While the yields of crop production per producing unit average higher in this county than for most of the Willamette Valley counties, this average can be raised still higher. When on some farms we find yields 30 to 50 per cent higher than the average for the county, it would seem that there is room for improvement on a large number of farms. This increase in production per unit can be brought about by more attention to soil fertility, better strains of seed and in the case of dairy cattle by the use of more proven sires. Increasing the pro-

duction per unit lowers costs per unit and, consequently, improves the income.

In practically all of our crops there is some room for improvement in quality. Quality improvement will not, however, tend to increase the gross return as much as it will tend to maintain the gross return. This is due to competition with other things. All produce that we put on the market comes in competition with the same product produced elsewhere or with something else that competes with the same market. Consequently, if we maintain our markets we must be alert to every possible improvement in quality.

Marketing of Agricultural Products

This committee believes that the place and importance of cooperative associations in marketing farm products has been amply proven and no arguments need to be submitted here to prove their value. The committee does wish, however, to point out an added development which it believes would help the marketing of farm products. At the present time we have several cooperative farm marketing organizations, some of which are comparatively large concerns, while others are small, and handle only one product.

If marketing organizations handled several products their overhead would be reduced and their effectiveness as a marketing organization would be increased. It requires about as much marketing and sales organization to sell one product as it would several products. Through the development of larger organizations or with some type of overhead arrangement between several small organizations it would appear that a more effective plan of merchandising Oregon products could be developed.

In some of the reports submitted by commodity committees participating in this conference the recommendation has been made that the railroads be petitioned for a change in freight rates regarding

mixed cars of products. It appears that many prospective purchasers of Oregon products cannot buy in car lots but would buy if purchases were possible in less than carload lots and if the freight rates were not prohibitive. If rates on mixed cars were proportionately the same for each product as the minimum car rate on that particular product the freight rate would not be prohibitive. This committee believes that such a mixed car rate would be of distinct advantage to Oregon growers and particularly to an organization that could sell several kinds of products, and wishes to endorse this recommendation.

Dairymen in Washington county in common with other dairymen throughout the Willamette valley experienced considerable difficulty in finding outlets for their surplus dairy stock at satisfactory prices. It is believed that a need exists for an organization to gather and disseminate, throughout the Willamette valley and adjacent areas, information on numbers and types of dairy stock for sale. It is also believed that this organization should investigate the possibility of direct distribution of surplus dairy stock to California dairymen. The present method of selling to California cow buyers does not appear to be returning Oregon dairymen a price in line with the selling price paid by the ultimate buyers in California.

Many Washington county and Willamette valley farmers have been induced to sell their products under "open end" contracts. It is believed that this is an unfair and unsatisfactory method of selling

and this committee recommends that it be made illegal. The committee wishes to commend concerns who have followed a policy of stipulated price contracts.

The Agricultural Situation and Outlook

Data prepared by the Bureau of Agricultural Economics of the United States Department of Agriculture and the extension service of Oregon State College shows that the general trend of prices for Washington county agricultural products rose sharply during the period from 1910 to '20 but has been downward since. Prices of crops and farm products in Washington county were for the most part slightly higher during the period of 1926 to 1930 than they were during the 1910-14 period. However, prices for those things the farmer had to purchase were correspondingly higher and the ratio of prices received to prices paid during 1926-1930 was not as favorable to the farmer as during 1910 to 1914. From 1930 to 1933 the prices of farm products in Washington county declined sharply, while the price of the things the farmer buys also declined but not in proportion. Since 1933 all prices have been moving upward and the 1935 farm prices compare very favorably with the period of 1910, to 1914, however, as yet the farmers' dollar will only purchase 86 per cent of the commodities it would purchase during the 1910-14 period.

The following table shows the average price to the farmer of eight important products of Washington county for the three periods 1910-1914; 1926-1930; 1931-1935.

	Average Price 1910-1914	Average Price 1926-1930	Average Price 1931-1935
Milk (per hundred weight)	\$2.95	\$2.35	\$1.75
Butterfat (per pound)	—	.44	.233
Eggs (per dozen)	.286	.297	.187
Wheat (per bushel)	.822	1.09	.567
Oats (per bushel)	.436	.527	.35
Barley (per bushel)	.618	.743	.441
Dried Prunes (per pound)	—	.059	.04
Hay (per ton)	—	12.00	10.37

In the estimation of this committee the exchange value of farm products should be a little higher during 1936 than during 1935 although this may be offset by an increase in the cost of farming. Comparing the cost of farming in 1935 with the 1910 to 1914 period the index stood at 126 in November whereas the index of prices received by the farmers stood at 108 per cent.

Interest on indebtedness, always an important item in farming costs, will probably decline slightly in 1936, but is not expected to change materially. It has been estimated that the average amount of interest payable per acre was 75 cents in 1932, 71 cents in 1933, 67 cents in 1934 and 58 cents in 1935. Most of the reduction was probably due to refinancing, forced liquidation, and debt adjustment operations rather than by normal payments. Further reductions are important as the interest load per acre is still nearly twice as great in relation to farm income per acre as before the World War, with land values about 80 per cent of what they were then. Taxes are not likely to be any lower in 1936 than they were in 1935. They may remain unchanged, if there is a change, they will probably be higher. Farm wage rates are comparatively lower than other major items of expense and can be expected to advance during 1936 as industrial conditions improve. Farm machinery prices can reasonably be expected to advance. It is unlikely that there will be any material

changes in the cost of items purchased by the farmer for family living. Food costs may be slightly lower. This will be balanced by a probable slight increase in other goods.

Considering the past trends, future status and outlook for costs and income, this committee believes that the farmer should be careful about his overhead and operating expenses, keeping the latter as low as possible and using his profits generally to reduce his debt load. Recommendations made in the credit section of this report should be followed.

Considering the general agricultural outlook, seed crops may be expected to increase in Washington county during the next few years. The dairy cow population and milk production will probably also increase somewhat due to a probable breaking up of some of the large farms. It is not expected that this increase will be very great. Hay production will probably remain about stable. There will be a decline in the production of small grains as the seed crop acreages are increased, also some of the more fertile land will probably be taken for cannery crops which will show some increase. Everything considered, these trends will probably mean an increase in the size of the unit for dairy cattle and seed crops. For seed crops this will mean an increased acreage under one manager, in the case of dairy it will mean a larger dairy unit with more intensive management.

Committee—H. D. Kerkman,

chairman

A. S. Burrier, Sec.

Oscar Hagg

Richard Joyce

W. C. Christensen

J. M. Person

R. G. Scott

John Plass

Ben Heesacker

H. R. Findley

W. G. Ide

Report of the Dairy Committee

1. THE DAIRY SITUATION

Dairy cows of milking age in Washington county increased from 14,497 in 1920 to 15,608 in 1935. The

statement as to cow numbers in the United States, the 11 Western states, Oregon, and Washington county is shown in the following table:

NUMBER OF MILK COWS ON HAND

Year	United States	11 Western States	Oregon	Washington County
1890	16,512 (1)	721 (1)	114 (1)	
1900	17,136 (1)	867 (1)	109 (1)	
1910	20,625 (2)	1,341 (2)	152 (2)	
1920	21,455 (3) (4)	1,541 (3)	200 (3)	14,497
1925	22,575 (3) (4)	1,623 (3)	217 (3)	15,527
1930	23,106 (3) (4)	1,814 (2)	222 (3)	13,768
1935	26,236 (3) (4)	2,264 (3) (4)	270 (3)	15,608

- (1) June 1
- (2) April 15
- (3) Jan. 1
- (4) Est. by B. A. E.

Source: U. S. { U. S. Census Reports
11 Western
Oregon, 1920-1930 Livestock,
Meat & Wool Market Statistics

The number of dairy cows of milking age in the United States increased during the period 1928-1934 nearly 3 per cent per year, reaching an all time peak in the spring of 1934 of an estimate 26,236,000. During that same period due to low prices for butterfat and poor pasture caused by five successive years of varying degrees of drouth in the larger dairying states, milk production increased only one per cent per year. Since 1934, due to the great drouth of that year and the natural decline in cycle of cattle numbers, the total number of milk cows decreased to an estimated 24,500,000 on January 1, 1936. During the past year prices of dairy products have been relatively low compared to prices of feed grains, beef, veal, and hogs. Statistical information shows a very close relationship between the index of industrial payrolls and butter prices of the country. In the 1936 United States Department of

Agriculture Outlook it was indicated that dairymen of the country are planning to increase their herds, but at the present time there are fewer heifers under two years old on farms than will be needed for replacements in the present national herd, and there is no immediate prospects of any increase in dairy cow numbers for the next couple of years.

Attention is called, however, to the fact that the present number of cows are but little different from the number of cows on farms in 1933 when there was an accumulation of 100,000,000 lbs. of butter placed in storage above the normal storage figures; and should consumers' buying power decline as shown particularly by industrial payrolls, the demand for dairy products will probably fall off, and by the same reasoning if consumers' buying power increases the demand should increase and prices for dairy products should improve.

NOTE: The figures on the Number of Cows are for thousands - for example: Reading across the line starting with 1890 there were 16,512,000 cows in the United States, 721,000 in 11 Western States, and 114,000 in Oregon. The figures for Washington County are as printed above.

II. DAIRYING IN WASHINGTON COUNTY

In 1935 the United States census showed a total of 4,371 farms in Washington county with 3,144 of these farms reporting cattle. It is estimated that not less than 95 per cent of the farms reporting cattle carry only dairy cattle.

Most of the milk produced in this county is marketed as fluid milk. This is sold to the condenseries, to Portland milk markets, local cheese factories, to creameries and is used in the towns of the county. Probably less than 10 per cent of the butterfat produced in this county is manufactured into butter in the county. Prices received for milk during the past year generally have shown improvement over the five-year average.

Improvement of highways has enlarged the Portland milk shed so that at the present time we find not only the counties adjoining Portland supplying milk to the city milk market, but groups of producers as far away as Polk county selling in this market.

In the past few years there has been generally more than enough Grade "B" milk produced on the farm to supply the Portland bottle and can trade. This has resulted in the establishment of basic ratings for all producers. The Dairy Cooperative Association began handling milk about August, 1931, the organization put into effect its basic rating plan that is essentially the same as the plan now effecting all Grade "B" producers which became effective when the Oregon Milk Control Board came into the picture.

Under this plan there is a basic price for milk, a surplus price and a pool price. The latter being the average price received for both the basic and surplus pools together.

Local markets exist for factory milk and churning cream. Cheese factories at Tigard and Gaston take a considerable quantity of local milk and their purchases are

not confined entirely to Washington county. There is one creamery at Forest Grove and the Carnation Condensor at Hillsboro has for years been an important factor in the market situation in Washington county. This organization first came in and created a market where up to that time the facilities for selling dairy products had been restricted to that part of the county close to Portland and to local creameries.

III. TREND IN DAIRY PRODUCTION

The number of cows has increased slightly and there have been noticeable changes in respect to certain types of production in the county. In 1932 shortly after the Dairy Cooperative Association began operating, the average size of herd of its members was 14.3 cows. Today from the best figures available, the size of herds in this marketing organization is 17.7 cows.

This shows an increase of approximately 3.5 cows per herd in a 4-year period. Herds supplying the condensery average about 6 cows each, this apparently being about the same as five years ago. Due to the cost of equipping for Grade "B" milk production and the increasing restrictions that are thrown around its production, it is unlikely that there will be any decrease in the size of dairy herds supplying Grade "B" milk. The tendency will probably be in the other direction.

Feeding.

The cheapest milk production of the year is made on pasture which is available on most farms not to exceed 60 days of the year. It is possible to increase this with irrigation or on some farms by the use of more grass or clover pastures. Where land is available sudan grass or red clover can be used to good advantage for summer pasture. If sudan grass is used, it should be seeded not earlier than May 15. This is a good summer feed. Sweet clover, if

a stem-rot resistant variety is used, offers some possibility. This should be seeded like alfalfa is ordinarily seeded in this county and on similar soils.

If water is available and land not too wet for ladino clover, this offers about the greatest possibility for a profitable pasture crop. Irrigated ladino clover pastures in this county are carrying an average of about three cows per acre from April until it gets too wet in the fall. On bottom land that overflows for relatively long periods of time Reeds canary grass offers possibilities and more of it should be grown along the Tualatin river and some of its tributaries.

Where pasture is not practical more crops should be grown that are cut and fed green to the cows. On farms where it can be successfully grown alfalfa is one of the most favorable crops for this purpose. The committee estimates that for a 10-cow herd four acres should prove adequate for supplying green feed throughout the spring and summer. On our better drained loam soils the alfalfa probably will be ready to cut for green feed as early as any other crop. It may be necessary in some cases to provide something that will be ready to use earlier than alfalfa. Vetch and oats in some cases are producing a little more early growth but it is doubtful if there will be very much difference between it and the alfalfa crop. One member of the committee suggests the following plan which is followed on his farm where oat and vetch hay is used.

The oats and vetch intended for hay is pastured. By the time this pasture is used the alfalfa is ready to use. After the farmer gets through cutting the alfalfa the first time he goes back to cutting oats and vetch green where it was not pastured. In some seasons this plan is carried through to July 15 when the oats and vetch is quite ripe. By that time the second cutting of alfalfa

is ready and one ordinarily can expect to have green alfalfa the rest of the summer.

It should be understood that in pasturing vetch and oats that if the hay crop is to be cut afterwards that that practice will probably be possible only on an especially well-manured soil that consequently is above the average in fertility.

Dairymen generally object to green feeding because of the labor involved. The committee estimated that it would require three or four hours per day for one man to cut the green feed required for one day for a 50-cow herd. For a 10-cow herd this might be proportionately higher. The committee believes that it is a practice to be recommended on farms where pasture is impracticable.

The committee believes that every dairyman should, if possible, provide a minimum of 25 pounds of succulent feed per day for each cow they milk. This may be supplied in the form of pasture, soiling crops, root crops, or silage. On most farms a combination of two or more of these practices will insure a supply of succulent feed when needed.

Kale, turnips and other root crops are valuable feeds on Washington county dairy farms.

Where small grains are produced on the dairy farm these should constitute the bulk of the grain ration. Supplemental feeds such as bran, oil meal or its equivalent, and bone meal may be purchased to make up a desirable dairy ration.

From the limited amount of data available the committee believes that locally grown seed corn will produce a better quality of silage than an eastern strain of the same variety of corn. Apparently the feeding value will be higher and the tonnage when figured on a dry weight basis will be nearly as large. The committee recommends that further data in respect to these seed strains be obtained by the

county agent through continued corn variety trials.

The committee believes that dairymen can well afford to adopt a feeding practice that will put more flesh on their cows during the dry period. This means more milk and butterfat when these cows freshen. This can generally be done by feeding a ration during the dry period that is not quite so high in protein as that used during the producing period.

Herd Improvement.

In the opinion of the committee the minimum production per cow necessary to pay operating costs is approximately 275 pounds of fat annually.

To eliminate unprofitable cows, determine their production costs, develop better feeding practices, and to prove sires the committee recommends that more dairy men use the milk scales and butterfat tests. This can best be done through a herd improvement or cow testing association. The committee also recommends that more attention be paid to the proving of sires through testing work and that proved sires be kept in Washington county herds as long as they are breeders.

Until January 1, 1936, there had been made in Washington county approximately 23,000 Bang's disease tests under the federal control program. These figures do not tell how many cows had been tested, as many have been tested more than once. It is estimated that there are 22,000 bovine animals in the county of testing age. Reactors up to January 1 were approximately 8 per cent of the animals tested which is an exceptionally good record and can be accounted for by the fact that for a number of years blood testing for abortion control has been carried on and, consequently, the disease has never gained the foothold here that it has in some localities. The committee recommends that dairy cow owners take advantage of the federal pro-

gram and have their cows tested under this program before the state plan becomes law and makes testing compulsory without any indemnity.

Quality.

The committee realizes that quality is and will continue to be an important factor in developing consumption of dairy products. The committee wishes to commend the agencies, marketing organizations and individuals that have assisted in improving the quality of butter, cheese and milk. It is their belief that the work of these groups should be continued. Feeding practices on the farm should be worked out so that certain milk-flavoring feeds are fed at such times that the milk will not be tainted. Generous feeding of green alfalfa, clover or corn silage immediately before milking will frequently produce strong feed flavors and odors. If these are fed four or five hours before milking these feed flavors can be eliminated. Most of the usual grain feeds and supplements do not produce "off" flavor.

Conservation of Manure.

The use of lime in dairy barns and on manure piles is detrimental to the value of the manure as a fertilizer because it causes the nitrogen to be released in the form of ammonia. Superphosphate is as much of a disinfecting agency and fly preventative as lime, helps keep the nitrogen in the manure and adds phosphorus, an element which barnyard manure lacks. We recommend for the reasons stated above that the milk inspection department of the Portland public health bureau allow the use of superphosphate in place of lime.

The committee also recommends better care of and use of manure, particularly by the use of more manure pits and liquid manure tanks, requesting Oregon State College to make plans and estimates on cost of constructing such tanks and pits that will meet the varying conditions found on Washington county dairy farms.

Size of Herd.

In recommending a minimum dairy unit of 10 cows the committee realizes that there are farms where because of their size or method of operation that a herd of this size is impracticable. Larger herds make possible more effective use of labor, the overhead for equipment, barn and the sire cost per cow is less than in the small herds. Dairy costs studies in both this state and other states show that in general larger herds are more efficient, have a lower cost of production and usually give larger profits. On many farms, however, dairying is more or less a side line, giving some outlet for surplus labor and unmerchandise feed that would otherwise be wasted.

In making the recommendation of a 10-cow minimum herd the committee does this not with any thought or idea that herds smaller than this should be eliminated but rather with the intention of pointing out that so far as a business-like, economical unit is concerned, a 10-cow herd is about as small

as can be handled efficiently.

It is recommended by the committee that in times of low, unprofitable prices the loss from a large herd is going to be more serious than in a small one. The committee also recognizes the fact that a small herd on many of the small farms and also some of the large farms adds to the total farm income and probably utilizes labor and available food to better advantage than might be otherwise possible.

4-H CLUB WORK

The committee believes that the 4-H club work being carried on with boys and girls in this county is of great value to the members enrolled in the work, to their parents, community, and county. This work should be encouraged, and to boys and girls, particularly the boys, the committee recommends that they participate in as much of this kind of work as possible. If they take the proper interest, starting early, by the time they are grown they will have acquired stock for a small beginning on a farm.

Committee—Henry Hagg, chairman

Roger Morse, secretary

A. P. Ireland

D. G. Lilly

J. J. Van Kleeck

A. J. Evers

Julius Christensen

Harry Hansen

C. B. Buchanan

John Kopplin

W. T. Putnam, Jr.

Report of Farm Crops Committee

GRAIN

I. THE SITUATION

1. Foreign countries, principally England, Germany, France, and Italy imported, before the World war and until 1930, from 600,000,000 to 900,000,000 bushels of wheat per year. These countries have walled themselves in with high tariffs, import restrictions, and milling regulations, until now they will buy only 500,000,000 bushels per year and a large part of this figure comes from their own colonies.

Before the World war Oregon farmers averaged 80 cents per bushel for wheat. From 1920 to 1930 the average price was \$1.10 per bushel and from 1930 to 1935 the average price was 58 cents per bushel. We do not have the Washington county prices except during the past five years when the average as reported by dealers paid farmers in this county was 57 cents per bushel.

In 1929 Washington county shipped out 68,000 bushels of wheat and in 1934 shipped in 47,000 bushels. The Tualatin area, the Forest Grove district and some other parts of the county are always deficiency areas and buy wheat for poultry and livestock feed. When the crop is average or above, about 15 per cent of the total production is shipped out to Portland or to other Willamette valley counties.

The average size of Washington county farms is 52 acres and there are about 1000 farms with less than 20 acres. About 15,000 acres of clover are grown per year.

Wheat is used for:

Nurse crop for red clover.

As a feed crop on poultry farms.

In a rotation with potatoes.

As a crop for sale with no definite rotation.

As farms are split up into smaller and smaller tracts and as the number of poultry and cows increase, it is likely that the home use for wheat will increase and so it is doubtful if Washington county will produce much wheat for outside shipment again, unless extremely high prices for grain or low prices for butterfat should drive people into wheat production.

Warehousemen of the county have made the following estimate of the percentage of the total area which each variety occupies:

White Holland	45 per cent
White winter	15 per cent
Rink	15 per cent
Jenkins	10 per cent
Marquis	10 per cent
Miscellaneous	5 per cent

Committee members gave the following estimate of the cost of producing winter wheat. It is realized that this cost is different on every farm so the figures are given only in order that growers may compare these costs with their own.

Harvesting with a combine would affect a saving of about \$2.50 per acre, but since most of the straw is needed the cost of picking up the straw would add about the same as the saving.

Estimated Cost of Wheat Production in Washington County

Cost per Acre	
Plowing	\$2.00
Harrowing, twice .....	.50
Drilling .....	.50
Seed	1.75
Binding	1.10
Twine .....	.25
Shocking .....	.50
Threshing, 4 cents per bushel	1.25

Hauling to machine.....	1.75
Sacks and twine.....	1.30
Hauling grain .....	.65
Taxes	2.25
Interest on land, \$100 at 5 per cent.....	5.00
Overhead labor.....	1.00
Automobile .....	.10
Loss of crop, freezing, etc., 1 crop in 8.....	.60

Total cost per acre....20.50

The above table is for winter wheat. A 30 bushel yield figure is taken and in the case of spring wheat the additional seed bed preparation cost would be about \$2 per acre. The following table shows the relation of yield per acre to the cost per bushel:

Yield per acre	Average Price 1931-1935	Average Gross Return per acre	Cost per acre	Net Return per acre	
Bushels	\$	\$	\$	Loss	Gain
18	0.57	\$10.26	\$19.40	\$9.14	—
25	0.57	14.25	20.04	5.79	—
30	0.57	17.10	20.50	3.40	—
40	0.57	22.80	21.30		\$1.50

In the cost figures in the above tables and in all subsequent tables it must be realized that only about half of these costs are cash, thus a grower can fail to secure cost of production, and yet perhaps be ahead of the actual cash cost of growing.

Which is More Profitable, Oats, Wheat or Barley?

Taking average 5-year yields and prices, the following table shows the relative returns of the three grains:

Crop	Average per acre	Yield	Average price per bushel	Average gross return per acre
	Bushels	Pounds	\$	
Winter wheat	29.5	1770	0.57	\$16.81
Spring wheat	22.7	1362	0.57	12.94
Oats	40.0	1280	0.32	12.80
Barley	35.0	1680	0.50	16.50

In all those cases where the grain is used for feed on the farm where produced, it will pay growers, so far as possible, to plant the one of the three which will produce the most pounds per acre.

It is noted that the average price for wheat has been 57 cents per bushel, oats 32 cents, barley 50 cents. Stated in terms of price per ton, wheat is \$19; oats, \$19.40; and barley, \$20.80. These small differences are not significant, so that actually the price per ton for the three grains during the past five

years has averaged \$20 or 1 cent per pound. There is no way to tell, of course, whether this relationship will prevail in the future, but marketing conditions do not look any too good for Pacific coast wheat.

Recommendations for Wheat

1. Wheat should be grown only in a rotation which includes a legume.
2. The rotation should be planned to include no more spring grain than is necessary. Spring grain is not likely to be profitable. Suggested rotations are:

- (1) First year—Winter wheat
Second year—Winter oats
Third year—Truck crops or spring grain
Fourth year—Clover
 - (2) First year—Winter wheat
Second year—Spring grain
Third year—Winter oats
Fourth year—Winter wheat
Fifth year—Corn or potatoes
 - (3) First year—Winter wheat
Second year—Clover
Third year—Spring grain
3. Wheat should not be grown on small farms.
4. We urge that the following varieties be grown because one of them is adapted to each section of the county:
- Winter varieties—
White Holland
Jenkins club or Hood
White Winter
- Spring varieties—
Marquis
Federation
5. We recommend that one to three farmers in the county concentrate upon seed production, roguing their fields, and taking especial pains to keep their seed free from weeds and other grains, thus serving as sources of seed supply for the county.

6. We recommend that Ceresan be used for treating wheat.

7. Where wheat is likely to continue to be a cash crop, vetch should not be grown for seed on the same farm, especially hairy vetch.

Oats and Barley

I. THE SITUATION

The oat acreage in the various United States census periods for oats in Washington county has been as follows:

1909.....	29,300 acres
1919.....	26,200 acres
1924.....	26,100 acres
1929.....	21,200 acres
1934.....	20,800 acres

The acreage of barley has shown a slight increase.

1909.....	500 acres
1919.....	600 acres
1924.....	700 acres
1929.....	3,900 acres
1934.....	3,100 acres

Varieties. Hannchen is the principal barley variety produced, occupying about 90 per cent of the acreage. The balance is made up of Wisconsin 38 and various winter varieties.

The oats crop is mainly grey winter oats. Each year some spring oats are seeded and these are divided between Victory, Kanota, Banner and some of the Shadeland strains.

The comparative advantages of barley are:

a. During the past five years it has averaged 400 pounds per acre more than oats. It can be expected to outyield oats in pounds per acre on good land, even though the oats yield more bushels per acre.

b. It can be seeded later in the spring.

c. As a feed for home use it is a better crop for use with oat hay or vetch and oat hay.

d. It can be substituted in the ration for corn which is higher priced.

e. In those cases when clover is seeded with a spring crop, it makes a better nurse crop than spring oats.

The advantages of oats are:

a. For shipment out of the county grey oats consistently offer a better market than barley.

b. Grey oats can be fall-seeded or winter-seeded.

c. It is easier to have a clean harvest with oats, there being less shattering so that succeeding fall sown crops have less volunteer.

d. On rich land the oats stand up better and are not so subject to lodging.

e. When winter wheat is the crop to follow, most of the committee members agreed that wheat yielded more following oats than when following barley.

Yields are necessary to pay costs. With average prices of the past five years and with the costs per acre as listed it would require 64 bushels of oats, or 41 bushels of barley to obtain the entire cost of production. It is normally easier to secure 41 bushels of barley per acre than 64 bushels of oats, but many good farms will average higher than these figures.

Recommendations for Oats and Barley

1. Either oats or barley should be grown only in a rotation containing a legume or a cultivated crop or both.

2. These grains should not be grown on the very small farm, it usually would be cheaper for such farms to buy their grain or use corn and devote their land to more intensive crops.

3. Ceresan should be used for treating either oats or barley.

4. A few seed growers should concentrate upon production of pure seed for sale to other farmers in the county.

5. Hannchen barley should be grown, mostly. A winter barley has some advantages in that it can be harvested extremely early and therefore makes a good nurse crop for clover. It grows in cooler weather than other grains and so makes excellent pasture and sometimes it is an advantage to have a grain crop to be threshed very

early in the summer. O. A. C. No. 1 is the hardier of the winter barleys.

Grey winter oats have the best market outlet of all varieties, are the best producing and have the highest feeding value.

Seed Flax

Flax prices have an advantage over oats, barley, and wheat, since flax is an import crop. It should be grown only on land free from weeds, should be planted rather early on well-drained land, and on good land.

Corn

Corn has never been grown for grain in Washington county to the extent that it has in the other Willamette valley counties. The following recommendations are made:

1. Only locally grown Minnesota "13" seed should be used.

2. Corn is recommended as a crop for small farms, as a means of eliminating the cash expenses of growing grain on these farms that can be used in one of the following ways:

a. Pick it and store it in narrow cribs with slatted sides.

b. Leave standing in the field and haul in on stone boats a little at a time as required for feed.

c. Hog or sheep it off.

Hay

The hay acreage has not changed much in the last 25 years, varying up and down from 32,000 to 41,000 acres; 34 per cent of the total crop acreage of the county being in hay. **Kinds of Hay Grown.**

The 1934 census reported the hay acreage as follows:

Variety	No. Farms Growing	Acres	Total Yield	Yield per acre	Gross Return per acre
Alfalfa	804	3,699	11,097	3.0 tons	\$31.50
Clover	1,562	15,792	35,659	2.2 tons	23.21
Oats and vetch	1,028	7,643	16,183	2.5 tons	26.25
Grain hay	1,574	7,305	13,879	1.9 tons	19.95
Totals		34,439	76,818		

The prices are those reported as average prices paid farmers during the past 5 years.

Disposition of Hay.

Of the 75,000 tons produced about 50,000 tons are consumed on farms within the county. This leaves a surplus of from 20,000 to 25,000 tons, most of which moves into the

Portland area. From 1/3 to 1/2 of it goes directly to Portland dairies. A little alfalfa moves into the county and this is mostly rabbit hay and small lots for sale to suburban part-time farms.

Cost of Production.

The committee estimated the cost of production as follows:

Item	Oats and Vetch	Clover	Alfalfa
Depreciation			\$4.62
Interest	\$6.25	\$6.25	6.25
Taxes	2.50	2.50	2.50
Plowing	2.00		
Harrowing .....	.50		
Drilling .....	.50		
Seed	2.25	1.50	
Seeding .....		.50	
Landplastering and spreading.....	1.00		.80
Mowing .....	.75	.75	Twice 1.50
Raking .....	.25	.25	Twice .50
Cocking .....	.75	.75	Twice 1.50
Hauling	5.00	5.00	Twice 10.00
Springtoothing			1.50
Total cost.....	\$20.75	\$18.50	\$29.17

Oats and Vetch: Cost per ton at 2.5 tons per acre—\$8.30. (Plowing may not be necessary—if omitted and the ground disked instead, it would decrease the acre cost probably \$1.00).

Clover Hay: Cost per ton at 2.5 tons per acre—\$7.40. (No credit for pasture and figured on basis of no seed bed preparation cost as clover was seeded on fall sown wheat.)

Alfalfa Hay: Cost per ton at 4 tons per acre—\$7.29. (Does not include any credit for pasture.)

In explanation of the \$4.62 depreciation item for the alfalfa, it is figured that the life of the stand will be seven years or six crops and the cost of obtaining the stand the first year will be as follows:

Item	
Interest on land (5 per cent of \$125).....	\$6.25
Taxes	2.50
Seed (12 pounds at 33 cents).....	4.00

Seeding .....	.50
Lime	7.00
Spreading lime.....	1.00
Plowing	2.00
Disking	1.50
Harrowing	1.00
Rolling	1.00
Inoculation .....	.50

Total cost of planting \$27.25
Mowing once the
first year..... .50

Total first year cost \$27.75

Alfalfa Development.

The alfalfa acreage has climbed as follows:

Acres in Washington county

1909.....	70
1919.....	22
1924.....	167
1929.....	3,054
1934.....	3,700

Recommendations

If the Wilson river and Wolf creek roads to the coast are completed, there will be a market for some additional hay, probably the product from 2,000 or 3,000 acres. This should be all legume hay and principally alfalfa.

With the revival of horse racing a market has developed for good timothy hay and the county could sell the product from nearly 1,000 acres at the price of about \$15 per ton to farmers. This hay will not be accepted unless it has a bright, green color which can be obtained only by cutting green and stacking or hauling to a barn. The timothy must be high quality, not injured by the weather and free of weeds.

Of the total hay crop of more than 34,000 acres, alfalfa now occupies only 10 per cent. It has the lowest cost per ton of any of the hays, is of the highest quality and releases the owner from annual work on that land so that it is easier for him to get all of his farm work done on time. Alfalfa should occupy at least $\frac{1}{3}$ of the hay acreage. Failures to secure stands have been due to:

- A loose seed bed.
- Failing to use lime.
- Seeding on flat land, swale or land otherwise not adapted to it.
- Pasturing or clipping too late in the fall.
- Failure to keep out gophers.
- Use of seed of unadapted strains. Certified Grimm seed should be the only kind used.

For sale on outside markets or for home use hay should be cut earlier than much of our hay is cut. Ripe hay is short of protein and protein is the most expensive feed a dairyman has to buy. By cutting green and securing a high percentage of protein, he can get more production from his cows at a lower expense than in any other way.

It is a good plan with alfalfa to alternate applications of landplaster and superphosphate. On oats and vetch landplaster should not be used if the hay grows so rank anyhow that it falls down and discolors badly. Landplaster at the rate of from 75 to 125 pounds per acre should be used on clover.

PASTURES

There is not enough use of pasture in Washington county. On many farms it is impractical while on many other farms, there are hill sides, draws, swales, and sometimes canyons—all of which may be in stumps or may have been cropped at one time or another which is sometimes good pasture and yet yields very little in the way of feed. If some of this land were torn up slightly in the fall, a grass mixture could be seeded on it that would greatly increase its value.

Pasture cost studies that have been conducted in the county show rather definitely the difference in carrying capacity and cost per animal unit of seeded grass pastures and native pastures that have not been seeded in Washington county.

On native pasture the number of cow days per year varies from one

cow day per acre to as high as five cow days per acre. These figures are all low but they are just what farmers are reporting. Rye grass pastures that have been seeded at a seed cost of 75 cents to \$1 per acre show an average capacity of just about 10 cow days per year at an average cost per cow day of 6 cents while the native pastures had an average cost per cow day of 27 cents, this difference in cost being due to smaller capacity.

Mixed grass pastures that were seeded at a seed cost of \$3.14 per acre show a range in capacity varying from four cows days per acre to as many as 45 cow days per acre with an average of about 16 cow days per acre. This wide range can be accounted for by the fact that some of this was seeded on creek bottom land where there

was more moisture, consequently the carrying capacity was greater. Two kinds of pastures previously mentioned were seeded on various soil types so that the averages should be somewhat indicative of what would be expected. The cost per cow day of mixed grass pasture was 7 cents.

Canary grass shows about the best cost per animal unit of any kind of pasture in the county. The figures submitted are as low as 1 cent per cow day to as high as 5 cents. This would give an average of 3.5 cents per cow day. Ladino clover has a high carrying capacity, some of the pastures in this county carrying 3 cow days per acre, but its use is primarily dependent upon irrigation.

Growers estimate the cost of oat and vetch pasture at 9 cents per cow day of pasture. This includes cost of seeding, seed, fences, taxes, and interest. The cost listed for the other pastures also includes all of these items. In view of these figures, the committee believes that on many Washington county farms there should be more pasture crops. The committee particularly recommends improvement of waste land on farms that are not in woods by seeding grass mixtures on it. For this purpose a mixture about as follows can be recommended:

Orchard grass	4 pounds
Red top	4 pounds
English rye grass	4 pounds
Highland bent	
grass	1 pound
Tall oat grass	4 pounds
Common white	
clover	1 pound

This makes a rather expensive mixture but it is a good one and will provide feed over as long a period as can be expected and at the same time will effectively hold the soil on hillsides.

On bottom land that overflows, the committee recommends seeding Canary grass whenever possible. They believe this should be seeded as early in the fall as there is moisture to sprout it. Seeding in the mud in the spring can be done and good stands can be expected but the fall seeding will usually be a little bit ahead of the spring seeding.

Highland Canary grass offers possibility for upland and undoubtedly in the next few years there will be a lot of this used for permanent pasture and hay on some of our less productive upland soils.

The committee wishes to point out that good pastures can not be maintained unless it is taken care of by not overgrazing and by use of some kind of fertilizer occasionally.

A commercial fertilizer carrying 16 to 20 per cent of available nitrates will mean a supply of pasture on grasses about two weeks sooner than will ordinarily be the case without fertilizer. This should be put on at the rate of about 200 pounds per acre. Occasional applications of superphosphate are also necessary to maintain a pasture over a long period of years.

WEED CONTROL

Canada thistle and wild morning glory are the two most serious perennial weed pests in this county. There are annual weeds that are serious but any annual weed can be relatively easily controlled by preventing seed forming. The weeds that we need to be particularly concerned about are the two perennials named in addition to quack

grass. Under existing laws the county court has authority to cut or have cut, noxious weeds on any property before they go to seed and to assess the charge for such control against the property. This law provision is all right in theory but in actual practice we find that in most instances the noxious weeds that are neglected are on property

that already is tax delinquent. Consequently having such work done means that this expense adds to the taxes of tax paying property owners.

The committee believes that an effective program in weed control can be made by general individual effort and that weed control is possible in the cultivated fields mainly through a cropping system.

Where wild morning glory or Canada thistle are serious the committee would recommend seeding such land to oats and vetch and cutting this crop off for hay at the usual time. Immediately after this the ground should be either plowed or disked thoroughly. This type of working should continue and be done frequently enough to prevent the appearance of all and every particle of green growth. This same land can then be put back into

oats and vetch the second time and the same process carried out the following summer. If this does not get all the thistles or morning glory they can be cleaned up the following year by putting a cultivated crop on the land.

Sodium chlorate will kill weeds and if it is used in sufficient quantities. Such quantities will usually run to four or five pounds per square rod. The cost of such material at the usual price and in quantities named makes its use on large areas prohibitive.

Annual weeds can be controlled by summer fallowing, by using cultivated crops and to a large extent by using late spring crops when ground is to be worked late in the spring.

The committee recommends more general uses of certified seed as a means of combating spread of weeds.

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E. R. Jackman,
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J. M. Vanderzanden
Ferd Langer
A. L. Croeni
John Kamna
Carl Bechen

Report of the Small Seeds Committee

The acreage for 1936 harvest of seed crops in Washington county is estimated as follows:

Hairy vetch	2500 acres
Austrian peas	3000 acres
Hungarian vetch	800 acres
Grass seed crops	100 acres

In addition to the above, clover is grown annually as a primary hay crop on 15,000 acres. Sometimes a good deal of this is used for seed but in more recent years the seed crop has been light. Western Oregon clover seed formerly commanded a premium of a cent or

two per pound as compared with eastern seed, but it now sells at a discount, due to considerable agitation against it in the middle western states. The T. A. R. (Tennessee Anthracnose Resistant) strain has been grown by a number of Washington county growers and this may have an eastern market at no discount and in some years at a slight premium.

The average annual production of red clover seed in Washington county the past five years has been about 90 pounds per acre and has returned to the grower approxi-

mately 12 cents per pound. Where a seed crop is particularly desired by a grower, pasturing or clipping generally gives a larger seed yield. Red clover is needed in our farming system and is generally grown in rotation; wheat, clover, oats or barley, wheat and then back to clover.

The acreage of Austrian field peas, hairy vetch and Hungarian vetch has been steadily increasing since about 1930. The increase in production of these three crops has been directly due to the demand for seed from the cotton belt. The average annual yield per acre of these three crops when planted in the fall are as follows:

	Clean Seed	Screenings
Hungarian vetch	600 pounds	500 pounds
Hairy vetch	250 pounds	500 pounds
Austrian peas	1200 pounds	500 pounds

Cost of producing these seed crops is given in the following tables:

Cost of producing hairy vetch

When Harvested with Combine		Harvested with Thresher	
Plowing)		Plowing)	
Harrowing)		Harrowing)	
Seeding)		Seeding)	
Seed	1.00	Seed	1.00
Rent	7.00	Rent	7.00
Cutting	1.00	Cutting	1.00
Harvesting	4.00	Harvesting	4.00
Hauling @ \$1 per ton.....	.50	Hauling .....	.50
Sacks .....	.80	Shocking .....	.75
Insurance .....	.15	Threshing	5.40
Cleaning .....	.75	Sacks .....	.80
Overhead labor.....	1.00	Insurance .....	.15
Automobile .....	.10	Cleaning .....	.75
		Overhead labor.....	1.00
		Automobile .....	.10
Total gross cost.....	\$20.30	Total gross cost.....	\$22.45
Credit 500 pounds		Credit	3.50
screenings @ \$14 per ton	3.50		
Net cost per acre.....	\$16.80	Net cost per acre.....	\$18.95

Cost of producing Austrian field pea seed

When Harvested with Combine		Harvested with Thresher	
Plowing)		Plowing)	
Harrowing)		Harrowing)	
Seeding)		Seeding)	
Seed	2.00	Seed	2.00
Rent	7.00	Rent	7.00
Cutting	1.00	Cutting	1.00
Harvesting	4.00	Harvesting	4.00
Hauling .....	.50	Hauling .....	.50
Sacks .....	.80	Shocking .....	.75
Insurance .....	.15	Threshing	8.25
Cleaning .....	.75	Sacks .....	.80
Overhead labor.....	1.00	Insurance .....	.15

When Harvested with Combine	(Continued)	Harvested with Thresher
Automobile 10		Cleaning 75
		Overhead labor..... 1.00
		Automobile 10
Total gross cost.....\$21.30		Total gross cost.....\$30.30
Credit 800 pounds		Credit 8.00
screenings @ \$20 per ton 8.00		
Net cost per acre.....\$13.30		Net cost per acre.....\$22.30

Cost of producing Hungarian vetch seed

When Harvested with Combine	Harvested with Thresher
Plowing)	Plowing)
Harrowing)\$ 4.00	Harrowing)\$ 4.00
Seeding)	Seeding)
Seed 1.50	Seed 1.50
Rent 7.00	Rent 7.00
Cutting 1.00	Cutting 1.00
Harvesting 4.00	Harvesting 4.00
Hauling ..... .50	Hauling ..... .50
Sacks ..... .80	Shocking ..... .75
Insurance ..... .15	Threshing 5.40
Cleaning ..... .75	Sacks ..... .80
Overhead labor..... 1.00	Insurance ..... .15
Automobile 10	Cleaning ..... .75
	Overhead labor..... 1.00
	Automobile 10
Total gross cost.....\$20.80	Total gross cost .....\$26.95
Credit 500 pounds	Credit 4.00
screenings @ \$16 per ton 4.00	
Net cost per acre.....\$16.80	Net cost per acre.....\$22.95

The figures on costs are those submitted by the committee. There are, of course, individual differences, but the committee believes that the figures given here are not very far from actual cost. The item of overhead labor is, of course, varied. This refers to an estimated charge per acre for the time that a farmer uses around the farm in overhauling machinery, repairing fences, cleaning ditches and dozens of other jobs. The automobile has be-

come a necessary vehicle in carrying on the farm business, and some portion of its annual operating cost should be charged against each acre of land.

Using the average yield per acre listed earlier in this report and the above cost per acre together with the average price and the last four or five years, we find that the average return for Washington county annual legume seed crops is about as follows:

	Yield Clean Seed per Acre	Price per pound	Cost per Acre	Net Return
Hairy vetch	250 pounds	6 cents	\$18.95	Loss \$3.95
Austrian peas	1200 pounds	2.8 cents	13.30	20.30
Hungarian vetch	600 pounds	3 cents	16.80	1.20

The production of grass seed has just begun in Washington county.

In 1935 seed was harvested from 12 acres of orchard grass and approximately 70 acres of English rye grass. This was in addition to some small acreages of common rye grass, mesquite and other grasses. The annual crop returns from grass seed probably will not be materially different than the average crop return from grain crops on the same land. Probably a little bit less.

The stands last a long time, however, if given proper care and the grower is consequently saving the cost of annual seeding. They have an additional advantage in that they will provide some pasture and on sour soils where erosion is becoming a problem, they will benefit in holding the soil. H. A. Schoth, agronomist, United States department of agriculture, Oregon State College, submits the following figures in regard to yields that farmers may reasonably expect from grass and seed crops:

	Yield
English rye grass	350-450 pounds per acre
Italian rye grass	400-750 pounds per acre
Orchard grass	250-300 pounds per acre
Tall oat grass	100-300 pounds per acre
Mesquite	300-600 pounds per acre
Chewing fescue	75-300 pounds per acre
Bent grass	50-100 pounds per acre

Imports on these grass seeds or those for which figures are available for the five-year period of 1930-1935 are as follows:

	Pounds imported
Bent grass	132,260
Chewing fescue	960,140
English rye grass	576,540
Italian rye grass	76,220
Orchard grass	152,880
Alsike clover	25,620
Red clover	589,680
Crimson clover	1,553,760
Hairy vetch	2,010,080
Hungarian vetch	53,940

Recommendations

1. Seed crops of grass and legumes are suited to only the larger farms.

2. An individual or neighborhood should not figure on more than 75 to 100 acres if the crop is handled with a combine.

3. In all cases where the grower is not sure that he can get a combine in time more of the seed can be saved by cutting rather green with a binder and shocking or by cutting with a mower or swather and shocking immediately. Either

of these methods will save more seed than is apt to be saved with a combine.

4. The committee recommends that growers operate their machinery to eliminate as much cracking of the seed as possible.

5. Austrian peas should be mowed just as soon as they will stand to be mowed; combined or threshed immediately as soon as they are dry enough; picked up right after the machine and fumigated. Prompt handling in this matter will save loss to the grower from pea weevil damage.

6. Pea screenings should be either ground immediately or fumigated. The fumigation will result in destroying more weevil than grinding.

7. Burning of the pea straw and stubble helps to keep down the amount of weevil infestation, but when such burning is delayed until the last of August or the first of September, it is useless and ineffective.

8. The committee recommends that where burning is to be done every precaution should be used to

prevent the spread of fire and wishes to warn growers that a fire permit does not relieve the owner doing the burning of responsibility in case of damage to adjoining property.

9. Austrian peas should not be pastured, if a seed crop is to be harvested.

10. It is far more important that hairy vetch be harvested promptly. Hungarian vetch can wait, but if the harvest of the hairy vetch is delayed, it is shattered out by the sun and weather.

11. In regard to pasturing the vetch should only be pastured in years when spring growth is heavy and usually May 1 is the deadline. Whenever fields are pastured, they should be land-plastered.

12. Owing to the fact that Austrian field peas generally return a higher income per acre, do not foul land, and when they become mixed with grain, can be cleaned out of it, the committee recommends that for Washington county growers plant peas in preference to hairy vetch and that hairy vetch be kept off our better land.

13. Growers of both peas and vetch should watch the cotton market closely and whenever they see cotton falling off markedly in price, they should go slow on plantings of both hairy vetch and peas that fall.

14. The committee believes that Crimson clover does not have a very important place as a seed crop in Washington county. The market is uncertain, a supply of moisture in the fall sufficient to sprout enough seed to produce a good stand is uncertain so the growing of the crop is too much of a gamble when compared with other crops.

15. The committee wishes to make the following recommendations concerning some of the other grass seed crops:

English rye grass—Seed from this crop if pure and preferably of New Zealand certified strain,

is a promising crop. It must be kept pure and must be certified.

Chewing fescue seed—Production of this grass is advised. The land to be used must be clean and particularly free from rat-tail fescue and sorrel.

Ladino clover—Seed production on this crop is primarily an irrigation project. It is possible to get profitable seed crops from it when planted on rather low creek bottom or swales but seed yields will usually be considerably less than the irrigated plots. When irrigated, irrigation should cease not later than the middle of July to give the crop ample time to mature so that harvest may be completed prior to rainy weather. Application of superphosphate or its equivalent is recommended for ladino clover where seed crops are being produced.

Other crops—There are several other crops that offer possibility for seed production in Washington county: onions, turnips, beets, radishes, cabbage and sometimes rape all offer some possibility. The committee believes that it would be a mistake for any farmer to attempt to grow these for seed purposes unless he has made definite arrangements for his seed crop. In other words, they should be grown only on a contract basis.

Development of a business of this type of seed crop probably will occur as we are able to get growers interested.

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J. R. Pubols

Vernon Burlingham

Elmer Guerber

Fred Jossy

Report of the Vegetable Crops Committee

Until recent years the market for Washington county vegetable crops has been primarily in Portland. The last few years processing concerns have been contracting local acreages of peas, corn, lima beans, and other vegetable crops. The combined acreage of the first three crops approximate 4,000 acres, divided among the crops as follows:

Peas	630 acres
Corn	2675 acres
Beans	550 acres

Soils for vegetable crops should be deep, fertile, must have moisture holding capacity, and be easily worked. Irrigation is advised for soil types suited to irrigation when the cost is not excessive.

Remunerative returns from vegetable crops should not be expected from moderate or average yields which are the rule on poorly drained, shallow, or wornout or depleted soils.

Commercial vegetable crops should not be planted, in the opinion of the committee, except when market outlets have been arranged in advance, and then only on rich soils adapted to high per acre production.

Growers should consider average, rather than high yields when calculating returns from proposed vegetable crop plantings.

Your committee submits the following figures on the cost per acre of producing certain vegetable crops:

Cost per acre of growing peas

Interest on land (5% on \$125)	\$ 6.25
Taxes	2.50
Seed (200 lbs. @ 8c)	16.00
Fertilizer (100 lbs. 11-48-0)	3.00
Spreading fertilizer .....	.25
Plowing	\$2.00
Harrowing .....	.50
Drilling .....	.75
Seeding Costs	3.25
Harvesting:	
Cutting	\$1.00
Picking up .....	.50
Loading	2.70
Total	4.20
Spraying or dusting	10.00
Cost without manure	45.45
Barnyard manure (10 tons per acre at \$2.50)	
\$25.00—½ charged to pea crop	12.50
Total cost including manure	57.95
Credit for pea vines	6.00
Cost less pea vine credit	\$51.95

Cost per acre of growing corn

Interest on land (5% on \$125).....	\$ 6.25
Taxes	2.50
Fertilizer, superphosphate	2.70
Seeding	\$1.00
Seed .....	.75
Picking, 2 tons	
@ \$2.75	5.50
Hauling	1.10
Plowing	2.00
Disking	1.50
Harrowing	1.00
Rolling .....	.50
Total land preparation and seed.....	13.35
Fighting rodents	1.00
Cultivating (2 times)	1.30
Hoing	2.00
Cost without manure.....	29.10
Ten tons manure—one-half charged to corn.....	\$12.50
Total cost per acre.....	41.60
Credit for corn stover.....	2.50
	<u>\$39.10</u>

When corn is sold to fresh corn markets a marketing charge must be added.

Cost per acre of growing lima beans:

Interest on land (5% on \$125)	\$ 6.25
Taxes	2.50
Fertilizer (600 lbs. Superphosphate 16%).....	5.40
Seed	\$5.70
Seeding	1.00
Plowing	2.00
Disking	1.50
Harrowing	2.00
Rolling .....	.50
Seed and land preparation.....	12.70
Cultivating (2 times @ 65c).....	1.30
Hoing	2.00
Pulling	\$1.00
Loading	2.00
Harvesting	3.00
Cost without manure.....	<u>\$33.15</u>
Ten tons manure (one-half charged to beans).....	\$12.50
Total cost	\$45.65
Credit for vines, fertilizer or silage.....	3.00
	<u>\$42.65</u>

The cost per acre of producing peas is \$45.45 without manure application and \$57.95 per acre with the necessary application of manure less credit for fertilizing value of the pea vines.

The cost of producing sweet corn is placed at \$29.10 per acre and at \$39.10 per acre with the necessary annual application of barnyard manure to hold up soil fertility.

Lima bean production costs are rated at \$33.15 per acre and at \$42.65 when manure is added.

Costs have been computed with and without the use of barnyard manure. The cost of using the manure should be figured in because observations of members of the committee from their own experience and their neighbors is that satisfactory yields of these crops will only be obtained on land that has been heavily manured or which has received the equivalent of the manure in the form of cover crops or crop residue. The committee believes that at least a 10-ton application of manure should be figured in the cost of growing such crops.

In computing these costs there are items which individual growers might question, and there are one or two items left out which might be included. There are one or two items that the committee did not put in because of the difficulty in determining the exact amount that should be generally charged.

Interest and depreciation on machinery does not appear anywhere in these cost estimates. The reason for this is that the committee estimated the cost of the various jobs in preparing the land, seeding and harvesting on the basis of what they would ordinarily have to pay if work was hired. In addition to the charges listed there are two others that should always enter into the cost of producing any crop but which have not been entered. One of these might be termed overhead labor or overhead maintenance.

Much time is spent around the farm in repairing, overhauling and general supervision that cannot all be charged against any one specific crop but which should be charged against each crop in the same proportion that that particular crop shares in the production of the total farm income. The same thing applies to charging the expense of the automobile against the various crops. Each crop should carry its share of these costs, and in determining the exact cost of growing any of these crops on specific farms these costs should be pro-rated among the various crops.

The use of irrigation for beans and corn is discussed and the recommendations concerning such irrigation appear in the report of the soils committee.

Other Truck Crops

In addition to these crops just named there is a small amount of celery, asparagus, spinach, cauliflower, tomatoes and broccoli raised in Washington county. The growing of these crops depends primarily upon the market. Growers who have contracts with concerns who buy quantities of such truck crops or who are used to selling on the public market may do well with these crops. Growing any of these crops requires very rich land, which means land that is heavily manured, or which has been built up by fertilizers and cover crops.

Growers are advised against open end contracts covering the production of these crops.

Pea Weevil

Pea weevil is the cause of heavy losses to growers and processors. Your committee recommends a continuation of research work to find effective and practical control methods for this pest.

Soils

Your committee recommends that growers of vegetable crops engage in their production only when deep

fertile moisture holding soils are available for use and when markets are at hand for the crop.

It is recommended that vegetable crop soils be well supplied with humus which is a source of plant food, and keeps the soil in a friable condition. Cover crops are a first essential and practical in accomplishing this end. Barnyard manures and straw, up to 20 tons per acre, are not extravagant applications when they are available.

Quality Improvement

Better quality of vegetable crops is a necessity because of an increasing attitude on the part of the critical consumer and increased competition in selling the processed article. A poor quality article reduces grades to the consumer and does not build up repeat orders. Proper varieties, rich soils, moisture supply, constant attention,

proper harvesting and after harvest care contribute to the quality of a product.

The committee considers it highly desirable for the several thousand farm families of Washington county to grow sufficient quantities of vegetable crops on each farm to assist in providing family supplies. Attention should be given to securing the proper varieties and to provide a succession of farm vegetables.

It is recommended that attention be given to the possibilities of vegetable seed production of certain kinds of these seeds annually. The growth of vegetable seed production will be slow. Two counties already have a start in this work.

There may be possibilities for the production of disease free pea seed, spinach, mangel, cabbage, sweet corn, cucumber and other seeds.

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Chas. H. Thompson
Harry Schmeltzer
Ed Mulloy
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Ferd Putnam

ONIONS

1. THE SITUATION.

Washington county produces annually approximately 250 acres of onions of the Yellow Danvers type. The production of this crop is limited to the beaver-dam lands.

There is seldom a shortage of onion acreage in the United States for any one year. Oregon onion growers make a profit when and if there is a crop failure or crop shortage in some large United States onion producing section.

The average yield of onions in Washington county is approximately 225 sacks per acre. The average

price for the past 10 years has been about \$1.50 per hundred pounds. Onion prices vary widely. During the last 10-year period the price has been as low as 22 cents per hundred pounds and as high as \$7 per hundred. In that same 10-year period there have been three low priced years. Growers producing onions will find it necessary to build up a reserve to carry them through these occasional bad years. The cost of growing onions as determined by the committee is as follows:

Costs for one acre of onions are as follows:

Taxes	\$12.00
Fertilizer	50.00
Preparation of ground	10.00
Seed	7.50
Planting	4.50
Weeding	50.00
Building Value—\$2500	
Depreciation and	
interest	45.00
Irrigation and drainage	10.00
Harvesting	25.00
Marketing	58.00
<hr/>	
Total	\$272.00
Interest at 6 per cent	16.32
Interest at 6 per cent	
on \$900 per acre.....	54.00
<hr/>	
	\$342.32

Insect Pests and Diseases

Onion smut is prevalent on certain onion lands. The Formaldehyde Drip method that moistens the seed with formalin solution as the seed is drilled into the ground affords effective control measures and its use is recommended where smut damages the onion crop.

Effective control measures for the onion maggot are not yet available although certain treatments may give some measure of control.

Your committee calls attention that sprays of bordeaux oil emulsion in 1935 and on trial plots were quite effective in controlling the onion maggot, but the cost of about \$40 an acre is too high to warrant its general use except when it is definitely known that the maggot infestation is serious enough to destroy much or most of the crop.

Your committee recommends that the county agent continues the trial plots using bordeaux oil emulsion and a study of the conditions that increase the onion maggot infestation.

Wild morning glory still is one of the most difficult problems confronted by certain onion growers. Chlorate sprays commonly used for weed eradication are not practical for beaver dam lands.

Your committee reports that because of the relatively high value of beaver dam land and the intensive crops grown, the use of carbon bisulphide is practical in some instances for use in killing wild morning glory.

The method of applying carbon bisulphide is: first, summerfallow the land for one season as morning glory should not be allowed to appear above the ground during the summerfallow period; second, next season, carbon bisulphide is used—2½ ounces in holes 18 inches apart and 6 inches deep and covered. Consult growers who have used this method or the county agent's office.

Commercial Fertilizer

Potash fertilizer, usually muriate or sulphate of potash, is conceded a necessity in most beaverdam lands for profitable onion production.

Onion growers quite commonly use quantities of barnyard manure, sheep, or poultry house manure supplemented with 300 to 400 pounds of muriate of potash per acre. Superphosphate sometimes is added at the rate of 200 or 250 pounds per acre.

Your committee believes muriate of potash will produce the most desirable yields.

There is no evidence that lime applications are of value in onion production and the use of lime is not advocated until proof is available supporting its use.

Seed Selection

Your committee urges growers to select a globe or half globe type of onion, and in either case, the base and top should be flattened, and the seed should have a thin or slender neck. The half globe or flattened top type of onion is favored. Onions for seed selection should have a dark brown skin with three or four outer layers. Growers who have selected seed onions and produced their own seed over a term of years, have estab-

lished better type, improved yields, and thereby have a reliable source of seed.

Recommendations for Onions

1. The committee recommends that growers continue the use of the formaldehyde drip method of treatment for onion smut. This has proven effective and no better treatment is known at the present time.

2. Demonstration and experimental work in the control of maggot should be conducted by the county agent's office and Oregon Experiment Station.

3. Fertilization is an individual farm problem and the committee believes that each grower can afford to set aside a small plot of ground where no fertilizer is ap-

plied, in order that a check may be made on the value of the fertilizer material he is using as it affects the yield of his crop.

4. More attention should be given to home production of Yellow Danvers onion seed.

5. The committee recommends summerfallow and carbon bisulphide treatments for wild morning glory control.

6. The committee believes the cost of producing onions can be placed at \$272 per acre and if interest charges are included, the cost ranges around \$342.32 per acre. Growers who contemplate onion production should consider these figures. It requires not less than three years to get low land worked and properly fertilized to produce onions.

POTATOES

1. THE SITUATION

The potato acreage of Washington county has declined somewhat during the last four years. For the past five years the acreage has been as follows: 1930, 4400 acres; 1931, 3500 acres; 1932, 3500 acres; 1933, 4000 acres; 1934, 4000 acres; 1935, estimated at 2500 acres.

The average yield of potatoes for Washington county in 1934 was 63.5 bushels per acre. This is a low figure, the average being about 100 bushels per acre.

The certified seed acreage for Washington county declined in 1935 after reaching its peak in 1933. The acreage of certified seed from 1930 to 1935 inclusive is shown below:

	Acres	Growers
1930	200	50
1931	217	38
1932	264	48
1933	309	54
1934	244	41
1935	141	25

While California was growing

Burbank potatoes as the main late variety, this county enjoyed a good market for most of its Burbank stock. As competition for the California markets began to become keener and irrigated sections like Idaho and Klamath county began shipping the high quality potatoes from their sections into the California markets, California growers turned to something that could give them heavier yields. This led to the increase in acreage of the White Rose potato and the loss of a market for most of the Washington county Burbank seed.

There is a market at the present time for seed stock for several varieties in limited quantities. These are: Burbank, White Rose, American Wonder, Bliss Triumph, Early Rose,, Cobbler, Garnet, Kahtadin, Earliest of All, and Netted Gem potatoes.

A few growers producing each of these varieties can do very well, but any undue expansion of the acreage of any one of these varieties would, at the present time, probably flood the market. Outside of

the seed market the potato production is limited to the following sales channels:

Direct to consumers and stores in county towns.

Markets that can be developed by individual growers for a particularly nice quality pack with some Portland store, hotel, or restaurant.

The public market in Portland. Home use.

Portland has been primarily a market for Washington potatoes. Carlot shipments into Portland from the state of Washington outnumber those from any other point of origin approximately 5 to 1. Most of the Washington stock is from Yakima. Late in 1935 Klamath county took a more active part in bidding for this local market. There always has been some market in Portland for locally grown

Burbank potatoes and there probably always will be, but with potatoes of the quality of those from Deschutes and Klamath the market for Washington county stock becomes increasingly lessened.

Prices the last few years have been unsatisfactory. Average prices for the past few years have been about as follows: 1935, 80 cents per hundred pounds; 1934, 55 cents per hundred pounds; 1933, 75 cents per hundred pounds; 1932, 75 cents per hundred pounds; 1931, \$1 per hundred pounds.

Freight Rates

At the present time most all potatoes shipped from the county by rail or water is seed stuff, and goes either to San Francisco or Los Angeles. Freight rates from Portland to these two California markets by rail and steamship are as follows:

Freight Rates

San Francisco	Rail	Water	Los Angeles	Rail	Water
Potatoes—less carload	61c	—	Potatoes—less carload	91c	—
Potatoes—carload	36c	25c	Potatoes—carload	52c	40c

Cost of Production

Cost of producing potatoes varies widely on different farms. The following costs are a summary of potato production figures on several Washington county places that grow about an average acreage:

Plowing	\$ 3.00
Preparing seed bed	3.00
Seed (700 lbs.)	10.50
Treating seed .....	.63
Cutting seed .....	.70
Planting	2.00
Fertilizer	
Cultivation	1.25
Irrigation	
Harvesting	10.00
Sorting	7.50
Sacks and Twine	4.80
Storage	3.00
Hauling to Market	6.00
Inspection .....	.60
Interest and Taxes	10.00

Depreciation 2.00

Total cost per acre.....\$64.98

Average total yield per acre 75 sacks.

Average marketable yield per acre, 60 sacks.

Cost per sack marketable, \$1.07.

With an average price the past few years of approximate 75 cents per hundred pounds, it would be necessary to get a yield of 87 sacks per acre of marketable potatoes to make the cost of production. This is considerably higher than this county has averaged.

Potato Recommendations

1. No increase of potato acreage in this county is justified. A market exists for a limited amount of good seed for several varieties pre-

vously mentioned in this report. California is still the primary seed market.

2. Better seed stock of Irish Cobbler, American Wonder, Bliss Triumph, White Rose, and Early Rose. There is a market each year for a few cars of these varieties but seed equal in quality to locally produced Netted Gem and Burbank varieties is not available.

3. To develop desirable seed stocks of the above varieties, getting small quantities of as good seed as can be obtained, planting them in tuber unit plots, and roguing them heavily is a recommended practice.

4. For a late and main crop potato it is recommended that the Burbank or Netted Gem constitute the main planting.

5. Improved storage is needed for seed potatoes. This means ventilation, particularly.

6. Potatoes consistently yield better on the higher hill lands of Washington county than in the valley. The percentage of the crop that will make a number one grade

is greater on the hill soils. The committee believes that growers on the valley soils will do better by using a round variety than a long variety of the Burbank and Netted Gem type. The Kahtadin is probably the best round potato for use on valley lands. It will not make No. 2's, it is a good keeper, is resistant to disease, and is drouth resistant.

7. We should continue to produce in Washington county a good grade of certified seed of Burbank and Netted Gem varieties.

8. Good seed is the cheapest seed no matter what the price. There are several potato diseases, all of which either reduce the yield or make a large number of culls. Treating the seed will not control the most serious of these diseases. They can only be controlled by getting rid of diseased plants in the field and by starting with good seed in the first place.

9. Potatoes on any farm should be grown only in rotation system and if irrigated, new, clean seed should be purchased each year.

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Report of the Horticulture Committee

TREE FRUITS

In 1930 the United States census lists 343,186 prune trees in Washington county. Figuring 69 trees to the acre, this would indicate that there was 4,792 acres. The acreage in 1935 was estimated at considerably less. Prunes and plums for the state of Oregon are given as 43,311 acres in 1919 and 54,852 acres in 1933.

Production of dried prunes in the Pacific coast states reached a total of 283,000 tons in 1935. During the same period the production of the tart, sweet Italian prune which is confined to the Northwest reached a total of approximately

37,000 tons and in addition there were approximately 1,200,000 cases of Italian prunes canned.

European trade barriers have closed the outlet for about 50 per cent of the Northwest output of dried prunes, the surplus further increased in 1936 by a heavy dried prune crop in California. Although the peak of production apparently has been passed in the Northwest, there is little indication of material improvement in the price of dried prunes under existing conditions.

Growth of world dried prune production since 1899 is as follows:

	California	Northwest	United States Total	Total—World
	Tons	Tons	Tons	Tons
1899	57,114	1,500	58,614	113,614
1909	75,000	22,250	97,250	158,950
1919	135,000	16,600	151,600	
1920	97,500	16,950	114,450	181,350
1925	146,000	11,900	157,900	207,900
1930	261,000	21,250	282,250	310,714
1934	170,000	32,200	202,200	238,699
1935		37,090	280,090	

Dried prune exports from the United States are:

United States average 1928-32.....	116,797 tons
United States exports for 1934.....	85,626 tons

Dried prune exports for 1934 were 31,171 tons less than the average for the five-year period 1928-32.

The trend of western canned prune pack is as follows:

1927.....	459,591 cases
1928.....	715,749 cases
1929.....	960,392 cases
1930.....	719,960 cases
1931.....	759,271 cases
1932.....	506,880 cases
1933.....	794,024 cases
1934.....	846,000 cases
1935.....(Est.)	1,200,000 cases

The pack of the western canned prune has increased from 459,591 to more than 1,000,000 cases in 1935. This continued annual increase of the canned prune pack may be one solution to the marketing of Italian prunes but growers and packers must take more interest in the quality of prunes going into the canned pack.

Recommendation

1. Hazard of marginal orchards. It is the opinion of the committee

that under existing and probable future market conditions cultivation and care of prune orchards that are not capable of producing an average yield of around 2000 pounds of dried prunes per acre of sizes larger than 50 to the pound is decidedly questionable, and owners of such orchards would do well to consider their removal.

2. New planting is discouraged for obvious reasons. Growers who wish to plant under present conditions must realize that the most severe competition of marketing prunes on an over-supplied market must be faced.

3. Size and quality should be improved. Washington county growers are advised to give every attention to cultural and pruning methods to the end that size and quality of prunes for both drying and canning be improved. The public cannot be expected to repeat orders for poor quality prunes, no matter how low the price may be.

In many instances growers may find it desirable to remove some of the trees in orchards where the trees are spaced less than 24 feet apart. One grower in Washington county grubbed out half the trees in his prune orchard and after two or three years the total production per acre in his orchard was just as large as it was before the grubbing took place and the size was increased from about 70's to about 50's.

Greater care should be exercised in harvesting. Prunes should be picked at the proper stage of maturity and every effort made to keep out rotten, ill-shaped or damaged ones.

Proper handling in the drier is doubly essential. Adoption of a reasonable standard of perfection that will be recognized and adhered to by growers and drier operators is imperative before there can be any hope of expansion of domestic markets today. Growers must take the initiative in correcting the situation.

The committee submits the following as an average estimate of cost per acre of production, based on an average yield of 2000 pounds per acre:

Cultivating	\$10.00
Pruning, etc.	25.00
Cover crop	3.00
Spraying and Dusting	6.00
Harvesting, Hauling and Drying.....	40.00
Interest @ 6% (\$300 per acre).....	18.00
Taxes	3.00
Total	\$105.00

The above figures indicate an average cost of production of approximately 5 cents per pound.

Recommendations for marketing are:

1. At present Oregon dried prunes from growers are placed in 11 or more classifications dependent upon size alone and valued accordingly, without reference to quality, and with a wide range in price. The committee recommends that the classification for dried prunes be made in regard to size, such as small, medium, large and extra large, and, that difference in value be governed primarily by quality rather than size and further, that satisfactory standards of quality be set up and measures taken to insure proper identification of quality by the ultimate consumer.

2. That the Prune Control Board take steps to eliminate prunes smaller than 70 to the pound.

3. That a uniform Oregon brand be adopted for all prunes that meet specified high quality standards.

4. That the Prune Control Board take action before the interstate commerce commission in an endeavor to obtain revision of railroad tariffs so as to permit shipment of mixed cars of canned and dried fruits, also frozen and barreled, at their respective car lot rates. This would open the market throughout the Midwest and South to Oregon products.

That much of the present plight of the prune industry in Oregon is due to failure on the part of producers to use a sales agency to maintain merchandising methods on a par with those of competing commodities. Price-cutting, open-end contracts, the consignment and warehousing evils, unfair dockage, and kindred abuses should be curbed through affiliation of a substantial majority of the independent growers into a bargaining organization operating with an optional pooling arrangement under Oregon Cooperative Law.

Orchard Management.

The committee realizes that some orchards are planted on soils that may not be altogether suited for tree fruit crops and makes the following suggestions regarding a program of soil management for orchards. This applies to all orchards whether prunes or other fruit trees.

Depth of Soil.

The soil for trees fruits and nuts should be 8 to 10 feet deep and well drained. Trees will grow, and sometimes yield profitably in soils of less depth, but on shallow soils, especially those underlaid with rock, hard pan and high water tables, the growers will be faced with production difficulties early in the life of the orchard. These troubles are more pronounced during dry seasons.

There are instances almost without number of orchard development projects by companies and individuals in the Northwest that have been entire losses to the owners because the soils were totally unsuited for orchard plantings.

Program for non-irrigated soils.

Orchard soils need annual additions to the humus supply to assist with the maintenance of soil fertility and as an important aid to preventing soil erosion. Orchards grow older and soils poorer year by year and a cover crop is not a luxury but

a necessity in keeping up the per acre production and for growing quality products.

Suggestions for soil maintenance are as follows:

1. Ten tons of cover crop, per acre, annually with its root system in addition, ranks first as an aid in the soil maintenance program.

Additions to cover crops for strengthening the soil maintenance and erosion prevention programs are:

2. Stable manure, 10 or 12 tons spread over the orchard annually.
3. Clover straw, 2½ to 3 tons per acre annually, or alfalfa hay refuse.
4. Straw, 2½ to 3 tons annually supplemented by addition of 100 to 150 pounds of nitrogen fertilizer.
5. Nitrogen fertilizers applied in late winter often greatly increase the cover crop yield.

The cover crop.

Winter barley and vetch lead as an orchard cover crop. The amounts of seeding vary from 30 to 60 pounds of vetch, and from 60 to 100 pounds of barley. Seed early in the fall and plow down early in the spring.

Vetch alone, 60 to 80 pounds per acre; winter grain alone, 100 to 150 pounds per acre; turnips, 3 pounds per acre; rye, for thin soils, 75 to 100 pounds per acre; winter barley, 60 to 80 pounds per acre, and other cover crops available. Mixed grains and vetches may be used, but avoid noxious weeds.

Cherries

As nearly as can be estimated the acreage of cherries in Washington county totals about 539 acres, most of these sweet cherries. The market for Washington county sweet cherries has been chiefly at Hillsboro. In addition to this there is a considerable quantity that goes

to Portland and in the last few years there has been an appreciable quantity packed at Sherwood.

Disposition of the western cherry crops is as follows:

Brine Cherries—The total number of 250-pound barrel packs is set at approximately 56,800 in 1934, of which the Northwest is accredited with approximately 25,000 barrels and California with 31,800.

Barrel Cherries—The west packs 95 per cent of all barrelled cherries. The United States produced in 1934, 101,000 barrels, 96 per cent of these being produced in the western part of the United States. The Northwest produced 56,000 barrels (6,986 tons). California produced 40,000 barrels (5000 tons). It is estimated that the total production for all of the eastern part of the United States is 5000 barrels, (625 tons).

Canned Cherries—In 1934, the west canned 996,449 cases of cherries which was 39 per cent of the total amount canned in the United States. The east canned 1,557,443 cases being 61 per cent of the amount canned in the United States. The canned cherry crop in the west returned \$3,005, 864, which was 46.6 per cent of the cash value of the canned crop in the United States. The east received \$3,439,467 which was 53.40 per cent.

Recommendations

1. Increased planting of cherries, either sweet or sour, is not recommended at present.

2. Improvement of quality of all varieties through better production and harvesting methods is urged. The excessive percentage of off-grade cherries delivered to processing plants is a serious handicap to the industry.

3. No cherries should be permitted to be shipped out of the state from infested areas unless adequately sprayed for cherry maggot and state inspected before shipping. In cases where maggot infested cherries are transported to processing

and packing plants in orchard or field lugs state laws prohibiting transportation of insect infested fruit should be rigidly enforced.

4. *Syneta* beetle causes much damage to unprotected cherry orchards and renders fruit unsalable, or lowers the grade to the point where it must compete with all other low grade cherries of the country. Growers have demonstrated that a 30-70 lead arsenate lime dust will effectively control this destructive insect.

5. Maintenance of the present cherry tariffs are essential to the welfare of the cherry industry.

6. Returns in recent years have been low, and abandonment of acreage may be expected to increase if prices to the growers do not improve materially. Only growers with low production costs and high yields may be expected to remain in the cherry producing business.

Peaches

For a long time peaches have been one of the profitable tree fruit crops on a few farms. The market, up to the present time, has been strictly a local proposition, that is, when the Portland area is included as a part of the local territory. The committee estimates that 75 per cent of the Washington county peach crop is sold either at the orchard or at roadside stands. The other 25 per cent is packed and sold mainly in Portland. Sales at the orchard and roadside are almost entirely by the bushel and members of the committee growing peaches estimate that the average price over a five-year period has been approximately \$1 per bushel. They estimate an average annual yield of marketable peaches at two bushels per tree.

Marketing conditions here are determined to a considerable extent by the Portland market which in turn is dominated by Yakima. When Yakima has a big crop that comes on about the same time or just preceding the local crop, the

local market occasionally drags, but there are very few years when the growers do not move their entire production.

Figures on the cost per bushel of production submitted by two growers are as follows:

	First Grower	Second Grower
Spraying, figuring crop years and non-crop years....	\$12	\$10
Boxes, shucks, nails, and nailing.....	.12	.12
Picking, grading, packing, and sorting.....	.18	.20
Hauling to stand or to market.....	.05	.05
Selling on stand or on market.....	.15	.15
Pruning and burning brush.....	.05	.05
Root bores .....	.01	.01
Cultivating .....	.05	.04
Thinning .....	.03	.03
Establishing original planting .....	.22	.23
Total	\$98	\$98

The above figures include \$225 per acre land at 6 per cent; \$3 taxes per acre; original cost and planting of trees; spraying, use of land, and care of trees for 4 non-producing years.

According to the above figures the cost of production per acre is approximately \$200. If a straight yield of two bushels of market peaches for every tree on an acre could be figured and the price of \$? per bushel realized there would be a good profit in growing peaches. In most of the older orchards of the county there are about 100 trees per acre, but not all of these trees are of bearing age and there are always a number of trees on every acre that are not bearing their share of the production.

Recommendations

1. Every peach grower should attempt a good plan of soil fertility maintenance. In this connection they suggest that the recommendations made in the prune section, which also fits peaches, be followed.

2. Peaches generally are being produced more satisfactorily on the better drained, rolling valley soils

than they are on the higher hills.

3. In the older orchards considerable more heading-back of the trees should be followed for the purpose of more renewal in the trees.

4. Careful spraying for curly leaf and blight control is necessary. It is recommended that growers stick to proven spray practices and leave the experimenting to someone else.

5. The establishment of uniform grades and uniform prices on peaches whether sold in crates, or bushels at the orchard, would be of value to all the growers.

6. Increased plantings of peaches are not recommended.

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SMALL FRUIT

THE SITUATION

The 1936 commercial strawberry acreage is estimated to be 11 per cent larger than the acreage of 1935, but it is expected to be 8 per cent less than the 1934 acreage. It is believed that the acreage for picking in 1936 will consist of 59 per cent new plantings, 29 per cent second-year plantings, and 12 per cent older plantings.

The acreage does not foretell the tonnage but the October 1 condition of all plantings is reported to be about 74 per cent of normal compared with 71 per cent a year earlier. These statements refer to the national situation.

Washington county is more concerned with the Pacific Northwest than with eastern sections.

The acreage in the Pacific northwest for the 1936 harvest is set at 26,200 acres, or 12 per cent increase over the 1935 acreage. The 1936 acreage will be approximately 33 per cent first-year plantings; 42 per cent second-year plantings; and 25 per cent older plantings. The condition of all plantings on October 1 was reported to be 78 per cent of normal compared with 80 per cent a year earlier. The average prices

received by growers in 1935 was 11 per cent more in 1935 than the previous year, but was about 24 per cent less than the five-year average price.

Frozen barrelled stock constitutes the major outlet for Oregon and Washington berries. The frozen pack in Oregon and Washington together with the canned crop and the relation of this market to the national pack is shown in the following table.

Frozen pack in Oregon and Washington:

1927.....	25,318,476	pounds
1928.....	41,209,209	pounds
1932.....	34,075,058	pounds
1933.....	19,452,899	pounds
1934.....	25,788,354	pounds
1935.....	Estimated at	
	about 1934 crop or 48,000	
	bbls. by "Facts in the Food Market."	

Canned strawberries in Oregon and Washington:

1927.....	334,644	cases
1928.....	289,791	cases
1932.....	206,453	cases
1933.....	54,612	cases
1934.....	71,500	cases

Source: Yearbook, Western Canner and Packer, 1935, page 27.

United States Canned Strawberry Pack
(Western Canner and Packer, 1935)

	1909		1919		1925		1933	
	Cases	Per cent	Cases	Per cent	Cases	Per cent	Cases	Per cent
Washington	3,409	2	21,107	6	110,574	40	27,142	36
Oregon	*		25,426	7	34,218	13	19,984	27
Michigan	9,754	5	87,892	23	17,693	6	**	—
New York	32,159	15	32,089	9	14,077	5	**	—
Maryland	106,724	51	75,215	20	1,675	1	**	—
All others	50,279	27	132,368	35	94,901	35	28,126	37
United States Total	208,406	100	374,097	100	273,078	100	75,252	100

* Not Available. ** Included in "All Others".

Commercial strawberry acreage in Oregon and Washington**

	Washington	Oregon	Total Northwest
1925	5,430	5,930	11,360
1926	6,090	7,320	13,410
1927	7,670	8,400	16,070
1928	8,900	10,000	18,980
1929	7,900	10,500	18,400
1930	7,500	9,450	16,950
1931	7,880	9,930	17,810
1932	8,980	12,120	21,100
1933	7,200	6,189	13,389
1934	7,500	8,500	16,000
1935	*8,500	*10,500	19,000

* Estimates from "Facts in the Food Market."

** Yearbook, Western Canned and Packer, 1935, page 66.

Cost of establishing strawberry plantings, plants set 3 feet by 2½ feet—
6,000 plants per acre:

First Year

Plowing	\$ 3.00
Harrowing and Disking	1.50
Marking	2.00
Plants—60000 @ \$3 per M	18.00
Setting (2 days)	4.00
Cultivating—7 times @ 75c	5.25
Hoeing—4 times @ \$3	12.00
Cutting Runners—twice @ \$1	2.00
Fertilizer—Manure and Spreading	25.00
Taxes	3.00
Interest on land (\$150 per acre @ 5%	7.50
Total	\$83.25
Bait for weevil the first year has become almost a necessity—this will add another per acre	4.00
	\$87.75

Dusting for spittle bug should not be necessary the first year.

Second Year

Cultivating (6times @ 75c)	\$ 4.50
Hoeing (4 times @ \$3)	12.00
Cutting runners (twice @ \$1)	2.00
Weevil bait and labor (may be omitted)	4.00
Dust for spittle bug (5% Blackleaf "40" @ 100 lbs. per acre and 7c per pound)	7.00
Applying dust (2 dustings)	6.00
Fertilizer	8.00
Taxes	3.50
Interest on land	7.50
Annual cost	\$54.50

Assuming that three crops of berries will be the life of the planting, we can divide the cost of establishing the planting by three, making an Annual Overhead of..... 29.25

Total annual cost to picking.....\$83.75
 Picking (1½ tons @ 1½ cents
 per pound\$37.50
 Yardman (4 days @ \$2)..... 8.00

Harvesting cost 47.50 47.50

Total annual cost.....\$131.25

These figures represent costs of years just closed and of course do not guarantee their accuracy against changes for the future.

The figures presented in these tabulations are based upon figures submitted by members of the committee and from several other Washington county growers. They are considerably lower than figures in the State College survey made in 1925. In the report submitted charges vary considerably. Some growers figure only two hoeings a year, while others figure as many as six. Some growers figure cultivation as high as 10 times, some as low as four. The figure listed in this estimate at 75 cents per acre for cultivation is pretty low, but it is about the average figure submitted. In the charge for fertilizer in establishing a new planting, \$25 per acre may seem high, but we believe the idea of the necessity of having the ground in proper condition through the use of plenty of barnyard manure or its equivalent is a well-established plan, consequently, we have figured a quantity of manure sufficient to be of value. Realizing that this perhaps is more than is generally used and that on many of our berry farms it is impossible to use it in which case a cover crop would be plowed down and that the cost of that per acre, it it is a desirable crop, while it would not be \$25 per acre would still be fairly close to it and that this figure would not be too far wrong.

This cost estimate omits some items that should legitimately be

charged against the cost of producing strawberries. Every year on practically every farm the owner spends a lot of time in general repair work around the premises, in building fences, overhauling equipment, supervision and general managerial effort. The proportion of such time and expenses to be charged against a strawberry enterprise will depend upon the proportion of the total gross income of the farm supplied by the strawberry crop. It certainly will add somewhat to costs. There is also omitted any charge for maintaining pickers' camps which is sometimes necessary and there is the question of carrier cost for the pickers.

The yield per acre has an important bearing on the cost per pound. The harvesting cost in the above estimate was figured on the basis of 3000 pounds of berries per acre. With a yield of less than that the picking cost would be somewhat less and heavier crop would, of course, slightly increase it, but assuming that \$131.25 per acre would be the cost per acre for yields of from half a ton to two tons per acre, the following table would show how the yield is a decisive factor in determining the cost per pound.

Yield per acre Pounds	Cost per acre \$	Cost per pound Cents
1000	131.25	13.0
2000	131.25	6.5
3000	131.25	4.2
4000	131.25	3.2

Raspberries

The raspberry ranks second in canned berry production in the northwest and first nationally. Cuthbert is the only important red variety. While the canned production of almost all variety of berries has declined somewhat, the raspberry pack has shown a steady gain in three decades.

Cost of Producing Red Raspberries.

One grower with probably the

largest commercial acreage in the county reports the total annual cost on red raspberries at \$65 per acre up to the time they are ready to pick. Using this as a basis and his figures for the rest of the costs, the cost of producing red raspberries would be as follows:

Initial cost.....	\$ 65.00
Picking at 2½c for 6000 pounds.....	150.00
Marketing at ½c.....	30.00

Total cost per acre \$245.00

Cost of Producing Blackcaps planted 5½ by 8 feet apart:**First year**

Plowing and Working Land	1 day	\$ 2.50
Marking and Cross Marking	½ day	1.25
Diggins Plants	1 day	1.50
Setting Plants	2 days	3.00
Working Land 4 times	1½ days	3.75
Hoeing 2 times	2 days	3.00
Tipping two or three times	1 day	1.50
	9 days	\$16.50
\$150 valuation at 5% interest		7.50
Taxes		3.25
		<hr/> \$27.25

Each Crop Year

Cutting old canes	2 days	\$ 3.00
Pruning, hauling canes away	2 days	3.00
Disking and Working	1 day	2.50
Hoeing 2 times	2 days	3.00
Tipping new canes—2 times	1 day	1.50
Hauling manure	1 day	2.50
Cost of manure		10.00
\$150 valuation at 5%		7.50
Taxes		3.25
		<hr/> \$36.25
Five crop years—\$37.75 each		
Spreading first cost over 5 years means an annual establishing record of		\$ 5.75
Annual labor, interest and taxes		37.75
Picking (1 ton @ 1½c per pound)		25.00
Yardman (4 days)		8.00
Cartage		1.50
		<hr/>

Total cost per acre

\$79.00

Recommendations**1. Strawberries.**

The committee believes that if Washington county continues to produce a high-quality berry and

produce them in sufficient quantities per acre to make it profitable to the grower, that we need to consider carefully the size of the planting and keep the acreage within

a limit where it will be possible to rotate the strawberry acreage so that berries are not on the same land more than three or four years at most out of a five or six year period.

The committee believes that there should be at least two crops on a piece of land between berry plantings. It is better if there are three crops and that if manure is not available, there should be at least one cover crop plowed under.

The committee believes that it is not possible to maintain satisfactory production with commercial fertilizers alone. It is the opinion of the committee and experience of growers seem to bear this out, that commercial fertilizers have their place and can be profitably used under certain conditions, but that the use of commercial fertilizers on strawberries planted on land deficient in organic material and in a rather low state of fertility will not be a profitable practice.

There is need of improvement of the planting stock to eliminate, particularly, crinkle disease, also that the productivity might be increased through plant selection. Growers are commended who have undertaken improvement of strawberry planting stock and recommend continuation of this effort and are of the opinion that if followed with a few growers producing stock certified to be free of crinkle that the results will be of great benefit to the industry.

So far as any information available now is concerned growers should consider the Improved Oregon or Marshall as the one standard variety. The Redheart is a variety that is becoming important but the planting of this should be dependent upon an assured specific market.

The committee recognizes strawberry root-weevil and spittle bug as two serious insect pests. They recommend baiting and dusting, respectively, for these insects and recommend the continuation of

work by the extension service in developing effective means of control.

Marketing.

The interstate commerce commission would approve the shipping of mixed shipments in one car such as dried fruits, nuts and canned goods, each commodity carrying its minimum carlot rate, such action would be of material benefit to our small fruit industry in the Pacific Northwest. We believe that this would be very advantageous to the producer and would not in any way affect the rights and privileges of the packer and at the same time would aid the consumer.

So-called "open-end" contracts are not a good thing. These contracts are in effect a consignment and frequently they result in a lower price, the grower having no protection under them, and we believe that growers should not accept "open-end" contracts and that these should be discouraged. While some growers have in the past benefited by such contracts, generally this type of contract does not work to the advantage of the industry.

2. Raspberries.

There isn't much room for expansion of red raspberry acreage. The market could take care of a reasonable increased acreage of blackcap raspberries.

Growers in planting either of these raspberries should consider the type of land to be used for the stock. Red raspberries need the best of land and should not be planted on the more heavy soil types. Blackcaps should be kept off wet land.

The committee believes that red raspberries and blackcaps can be fertilized profitably each year with barnyard manure, litter from chicken houses or the equivalent of these in clover straw, and that these materials are the most desirable fertilizing materials to use for these crops. In the case of red raspberries the committee recom-

mends early cultivation and covering of the old leaves that are on the ground as a measure of rust control. In a good many red raspberry plantings pruning out of the old canes is not done carefully enough. These should be cut so there is no stump left as the stumps frequently carry rust spores which will infest the new canes.

Strawberry root-weevils are just as injurious to red raspberries as to strawberries. The control measure is the same.

Some red raspberry plants are seriously damaged because of the manner in which they are cultivated. Cultivation should be rela-

tively shallow as the feeder roots are close to the surface of the ground and any kind of deep cultivation will injure the feeding system of the plant and consequently reduce the quantity and quality of the crop.

Blackcap yields generally are not satisfactory, being too low in many cases. This is caused primarily by two things, first, too many hills affected with wilt; second, having them on ground too wet and sometimes low in fertility. This committee recommends that growers rogue their patches and as soon as wilt appears in a hill to dig it up and burn it.

Committee—W. E. Marr, chairman

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secretary

A. J. Rowell

Warner Crop

Ed Schlegel

J. O. Boger

NUTS

GENERAL SITUATION

While this report deals largely with English walnuts and filberts, which are being grown to a considerable extent in Washington county, any conclusions made should take into account other kinds of nuts produced elsewhere in the

United States, all of which are in the same competitive class, principally almonds and pecans.

As an aid in such a consideration the following table is given, showing production, importation, and consumption, in millions of pounds.

	Walnuts			Filberts			Total Consumption
	Pro- duc- tion	Im- porta- tion	Con- sump- tion	Pro- duc- tion	Im- porta- tion	Con- sump- tion	
1911-15	24	47	71	0	14	14	
1916-20	20	48	68	0	20	20	
1921-25	48	67	115	?	24	24	
1926-30	54	64	118	1	25	26	
1934	74	15	89	2	7	9	
	Almonds			Pecans			
	Pro- duc- tion	Im- porta- tion	Con- sump- tion	Pro- duc- tion	Im- porta- tion	Con- sump- tion	
1911-15	5	46	51	20	2	22	158
1916-20	10	73	83	30	1	31	202
1921-25	16	77	93	31	2	33	265
1926-30	24	61	85	52	1	53	282
1934	21	10	31	39	0	39	168

Acreage in each of the above kinds of nuts has steadily increased. With present plantings in full bearing, the United States production of these four kinds of nuts will be more than 50 per cent above present production. The rapid drop in consumption figures is no doubt explained by the reduced purchasing power of the public at large, although the present acreage seems to indicate a potential production equal to meet consumer demand even with the return of normal purchasing power.

A consideration of present, and probable future, supply and demand of all kinds of nuts in the United States, together with price trends and future price outlook, suggests that future plantings, if any, should be limited to best locations which will assure maximum production at a minimum of cost, if profits are to be expected.

Walnuts

Estimates place the 1935 United States walnut production at 45,000 tons while the commercial European crop is estimated at 75,000 tons. Estimates on the Chinese crop are not available.

Trends of Oregon-California Walnut Production

5-yr. Period	Average
1916-1920.....	20,100 tons
1921-1925.....	22,200 tons
1926-1930.....	33,000 tons
1931-1935.....	41,800 tons
1935-1939.....	45,000 tons estimated

The acreage of English walnuts in the United States is practically confined to the Pacific coast. This acreage in California and Oregon is listed as follows:

	Bearing	Non-Bearing	Calif.-Ore. Acreage
California, 1922	67,869	19,141	87,010
Oregon, 1922	4,000	4,000	8,000
California, 1934	117,500	21,500	139,000
Oregon, 1934	15,000	12,000	27,000
Total—1934			166,000

The walnut control board compiled figures pertaining to the merchantable walnuts in tons. Their

figures are given in the following table:

California and Oregon

Year	Southern Calif.	Northern Calif.	Total Calif.	Per cent of total Crop	Oregon	Per cent of total Crop	Total
1929	28,548	4,262	32,810	97.23	935	2.77	33,745
1930	18,629	5,998	24,627	97.80	553	2.20	25,180
1931	12,799	6,061	18,860	92.45	1,540	7.55	20,400
1932	29,091	8,318	37,409	95.02	1,960	4.98	39,369
1933	18,666	6,799	25,465	97.95	523	2.05	25,998
5-yr. Ave.	21,547	6,288	27,834	96.29	1,102	3.91	28,938
1934	21,027	13,157	34,184	93.99	1,903	6.01	36,369

In the spring of 1935 a survey of the fruit acreage of Washington county was made under the direction of the state agricultural statis-

tician with SERA help. This survey showed the following figures relative to the number of trees, their age, and total production.

Age of Walnut Trees

1 to 4 years	5 to 8 years	9 to 15 years	16 to 25 years	26 years and over	Total bearing 1934	Total trees in Ore. chargs	Total Production Tons
10,196	27,676	39,123	12,968	3,397	62,320	93,358	626.77

The planting of walnuts in Washington county has probably passed its peak. Some of the old orchards have reached a stage of growth where because of competition from moisture during the summer the crop is being limited. In one or two instances part of the trees have been grubbed out with satisfactory results following in regard to yield and quality.

Yields of Washington county orchards have not been all that could be desired. Average yields are under 1000 pounds per acre, while in some of the better orchards that have had good care throughout their life yields have gone above 1000 pounds per acre. These higher yields may be attributed to better soil in some cases, generally better care, particularly, while the trees are young, so that they have grown a bigger tree, and cultural practices such as to build up and maintain fertility together with increasing moisture holding capacity of the orchard soil.

The cost of producing walnuts in Oregon in 1929 was 17.4 cents and in 1931, 9.2 cents per pound. In Washington county for those years it was 15.6 cents and 10.2 cents respectively. In 1931 the low cost group in Oregon had an average cost of 4.4 cents per pound. The high cost group had costs from 13 cents to 54.1 cents. In 1929, on the other hand, the low cost group averaged 9.4 cents and the high cost was 78.5 cents per pound.

Recommendations

Advertising of both Oregon walnuts and filberts is needed.

Protection of the northwest nut industry against importations of nuts produced in Europe and the Orient under a low standard of living and labor condition is held imperative. This committee recommends that no action be taken by our national government which will lower the protection to the northwest offered by tariffs now in force.

Tariffs on Imports Into United States

Tariff Act	1913	Unshelled	Shelled
Act, Sept. 22, 1922		2c lb.	4c lb.
Act, June 18, 1930		4c lb.	12c lb.
		5c lb.	15c lb.

The committee recommends that new plantings, if any, should be put only on the best of land, well-drained and with deep soil. In orchards already planted and not bearing or beginning to bear, growers should take pains to follow such cultural methods necessary to get their production into the higher-yield classification. The following figures and statements pertaining to competition in the walnut industry point out the advantage of maintaining good yields per unit.

Walnut growers have very heavy competition in marketing not only from the industry itself, but from almonds, pecans, cashews, filberts and other nuts. Growers are faced with the necessity of securing high per acre yields of a good quality nut in order to meet this competition. Owners of low-producing walnut orchards having high production costs may well consider abandonment of such orchards.

New plantings if made, should be with a full understanding that the

strongest kind of competition will have to be met from walnut producers at home, abroad, and from other nuts both domestic and imported.

The size of new walnut plantings should receive serious consideration from those who plan to depend upon walnut production for their entire income. With low prices prevailing the small walnut tract is not an attractive venture as a sole source of income.

The following returns from small plantings of walnuts is taken from cost account records by Oregon State College in 1929, but they serve the purpose of illustrating the necessity of having the walnut enterprise large enough to return an adequate income when this is the sole source of revenue.

7	5,575	\$757.53
10	3,588	473.46
12	2,627	345.48
4	1,245	136.66
20	3,919	490.50
25	*23,440	4,437.28
20	4,581	405.75
15	6,191	873.65

*Note the high per acre production of this orchard.

Growers should employ harvesting methods which will place walnuts in the packing house in the best condition possible. Walnuts should not be shaken from the trees until the husk has loosened. They should be picked up and dried immediately after they fall. To delay picking up and drying results in poor quality kernels.

Filberts

Acreage planted to filberts has been increasing quite rapidly during the past 10 years until there is now near 10,000 acres in the United States. About 45 per cent of this acreage is under five years of age and, therefore, is not yet productive.

The production bears rather constant relation to the acreage of trees of five years of age and

above. It has increased from about 100,000 pounds in 1925 to 2,000,000 pounds in 1935. Present acreage is capable at maturity of producing two or perhaps three times the present production.

The consumption of filberts has declined since 1930. In 1914 the United States consumption was 14,000,000 pounds. The average annual consumption for the period, 1920-1930, was 25,000,000 pounds; the 1932 consumption was 14,000,000 pounds; and 1934, 9,000,000 pounds. The decrease in the consumption of filberts has been somewhat greater than the decrease in consumption of other nuts, which is no doubt explained by the fact that the available supply up to the present has been almost entirely dependent upon importations.

The price trend has been downward for several years. Jobbers' prices on the 1935 crop ranged from 13 to 16 cents, or a little above the price of a year ago. These prices are but little more than one-half the prices effective ten years ago. While this is somewhat in line with the trend of other food products, it is rather more pronounced in the case of nuts in general as might be expected since they are in the semi-luxury class of food supplies. The price of filberts is further affected by the price at which the foreign-produced nuts are delivered in this country, duty paid. At present there is a duty of 5 cents per pound on filberts in the shell and 10 cents per pound on filbert meats.

A survey on the cost of producing filberts by Oregon State College, co-operating with the United States Department of Agriculture begun in 1932 and continuing into 1933 but not completed for lack of funds, shows for the 1932 crop in 36 orchards covering 436 acres of trees averaging 9 years of age, an average cost of 13.7 cents per pound.

*From the grower's standpoint, these figures must be reduced by the cost of marketing.

The cost of Washington county orchards included in this survey were almost identical in average cost. This survey showed a wide variation in costs. The 20 per cent high cost orchards averaged 23.3 cents, while the 20 per cent low cost orchards averaged 7.7 cents per pound; 1932 being a low yield season, cost figures were adversely affected. Orchards 9 years old cannot be considered in maximum production, larger production, if obtained, further reducing the per pound cost.

Climatic conditions in Washington county are ideal for filbert culture. There is also much acreage in the county having soil well-suited to the successful production of filberts. Care should be exercised in selecting locations for further plantings in order to insure high production yields at a minimum of cost of operation. Plantings should be made only on fertile soil which affords easy cultivation. Soils must be deep, well drained, and of such texture as to permit uniform root penetration to a depth of 6 to 8 feet or, better of 10 to 12 feet to assure trees of long life, capable of high production.

While some new varieties show merit and may be planted somewhat experimentally, nothing has yet been developed and proven equal to the so-called Barcelona from the standpoint of grower profit, combined with consumer demand. It should be cross-pollinated with at least two varieties, proved by test and experience to be effective.

Pecans

The climate of the Willamette valley is not suited to the production of pecans. There are specimen trees in many valley acres, none of which has ever matured a nut. Even the varieties grown with some success in the cold sections of the eastern part of the United States will not mature here, undoubtedly due to the short, cool summers of the northwest.

Almonds

While a few trees may be planted as novelties for the bloom and the occasional crop that may be obtained, the experience of those having such trees indicates it would be folly to undertake their culture for their monetary return.

Chestnuts

The world consumption of chestnuts is about twice that of all other varieties of nuts combined. The consumption in the United States is much lower proportionately, being about 20,000,000 pounds annually, all of which is imported at the present time. Their culture in the northwest seems to be largely experimental.

Seedling trees seem to grow to maturity and bear well. Much experimenting has been done with grafted varieties. Plantings of grafted trees have proven expensive to those trying them on a commercial scale. Almost total loss of trees seems to result after three to five years. Until, and if, further experimental work produces a satisfactory grafted variety on suitable root stock, planting on a commercial scale should be avoided.

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Report of the Livestock Commodity Committee

I. THE SITUATION

Livestock production in Washington county is a sideline on most farms. Grain farming and dairying constitute the greater part of our source of farm income and these

offer some opportunity for sideline production in sheep, hogs and to a limited extent a few beef cattle. The table below shows the livestock situation in Washington county as pertaining to the number on hand now and in 1930:

WASHINGTON COUNTY LIVESTOCK

	Farms Reporting in 1935	Number	Farms Reporting in 1930	Number	To Farrow 6/1/35	To Farrow 6/1/30
Swine	1149	7171	883	9345	745	793
Sheep	157	1/1/35 6408	4/1/30 186	4/1/30 10760		Ewes—1 yr. old or over 4320
Horses	All Ages 1935-1930	Colts under 2 yrs.	1930 Colts—3 mo. to 27 mo.	1935 2 yrs.& older	1930 Over 27 months	
	5022 5316	77	65	4945	5251	

The number of beef cattle in the county are negligible. The total number probably will not exceed 500 head, certainly not over 1000. The figures in the above table are from the 1935 census.

On many of the larger farms sheep could be used to good advantage and there is some land in the west and north part of the county that has been logged-off, and which is adjacent to some of the valleys where there are farms, that could be utilized for sheep pasture. There has been an increase in the number of sheep in Washington county since 1930. On farms where cows are an important business and are carried in considerable number for that particular farm, sheep do not fit in. One of the most serious handicaps that the sheep man is under locally is the loss from dogs. In 1935 bills for 167 head of sheep and 53 goats were turned into the county court

for payment. This represents the claim for animals killed by dogs.

The market situation on both mutton and wool for the next year or two looks improved over the past few years. Small farm flocks are about all that are practical in this county and these only on those farms devoted mainly to hay, grain or seed and where the owner can get around the dog menace. On an average only about 150 pounds of hay per head is fed for wintering sheep in this county.

The average price of a lamb in Portland, 1928-1933 was approximately \$6.80 per hundred pounds. On the Portland market there usually is a spread of nearly \$2 a head between good and choice lambs as compared to medium lambs. This spread usually is greatest in May and June and narrowest during the winter months. The matter of spread between the grades is, of course, determined to a large ex-

tent by the supply. When there are lots of lambs coming on the market the spread between these grades will be more than when the supplies are short.

The Pacific Northwest usually has been producing fewer hogs than are consumed here. The average price of hogs in North Portland for the last 10 years has been \$9.25 per hundred, live weight. This has been the average price on the medium to choice grades. The average price of hogs at five markets in the United States from 1924 to 1934 is shown as follows:

Omaha—\$8.03; Portland—\$9.25; San Francisco—\$9.51; Los Angeles—\$9.56; Chicago—\$8.47.

This gives Portland an average differential for the 10-year period of \$1.22 per hundred over Omaha and 44 cents per hundred over Chicago.

Colts Increase on Farms

As nearly as the committee can determine there are seven purebred stallions in the county and two grade animals. During the past two years there has been a noticeable increase in the number of colts raised, although some mares that have been bred the last two years are not of the type or kind to produce desirable draft colts. Horses returned an average of \$115 per head to Oregon farmers in 1910 to 1914, \$68 a head in 1926 to 1930, and \$64 per head in 1931 to 1935.

Practically all of the beef cattle raised in the county are in connection with isolated farms and logged-off areas where a large part of their feed is spring and summer range among the stumps. There have been one or two farmers who have from time to time fed a few feeders over a period of years. These fellows have done fairly well in a small way.

Recommendations

Beef Cattle.

Some winter feeding of beef cattle is possible on farms where cheap

hay and other feeds are available. This committee believes that this is a rather special business requiring considerable study and knowledge of markets and that success in it will depend on a stable market. **Sheep.**

Some winter feeding of lambs using legume hay, barley and pea screenings has been done. There is an opportunity on some farms where such feeds are available for this type of enterprise. One man in the county reports feeding a considerable number of lambs one year giving them about all the chopped legume hay they would eat, starting them on $\frac{1}{4}$ pound of barley per head and increasing this up to $1\frac{1}{4}$ pounds per head per day.

The committee recommends that more attention be paid to pastures for sheep on farms where farm flocks are practicable. It is desirable to have pasture for use as near lambing time as possible. A small patch of rye seeded in the fall makes good early ewe and lamb pasture on some farms. The acreage of this should be limited. Red clover can be pastured in the spring where it is not necessary to cut a hay crop and this method of handling will fit into the production of a clover seed crop very nicely. When this is done, the sheep are kept on it up to about May 20. Rape seeded in spring grain will provide considerable green feed late in the summer and early fall. Two pounds of rape per acre seeded in this manner will provide succulent pasture at the time it is needed. Most red clover in this county is seeded in February on fall-sown wheat. That is a practice that should be followed. On some farms, however, where it is difficult to obtain stands of clover in this way and where there are sheep, it may be possible to get a good stand of clover by seeding it with rape in May. When this is done the clover is seeded at the usual rate on a finely pulverized and well-packed seed bed. The rape will provide sheep pasture through a good por-

tion of the summer. Pasturing sheep should be rotated and not kept on the same field or pasture continuously. The exact length of time a flock can remain on the same pasture without trouble from worms will depend upon the number of sheep per acre. Generally it is a good plan to move them at least once every six months and it is better if this is done about every four months.

This committee believes that lambs should be started on a little bit of grain as early as possible and suggests creep-feeding as a practicable means of getting them used to the grain and getting a thrifty rapidly growing lamb. Where creep-feeding is done, a good mixture of grain is ground oats—9 pounds, and oil meal—1 pound.

The time of lambing will vary according to feed supply.

Easter lambs are, of course, the high priced lambs but not every one can produce them. Unless it is intended to hit this Easter market, February 1 is a practicable lambing time. We nearly always can figure on green feed by the first of March and the February 1 lamb

will be big enough to begin to make good use of green grass by March 1. A top lamb on the Portland market usually is around 80 pounds with the exception of Easter time when, an Easter lamb weighs 60 to 75 pounds, preferably the lower figure, will be about a top lamb. Differentials between choice and medium lambs usually exist, but disappear in times of scarcity. This differential is sufficient to warrant an attempt to produce lambs that would grade good to choice. The committee recommends, particularly, that all lambs be docked and trimmed as soon as practicable. The committee recommends that 4-H sheep clubs be continued. Enrolling boys as members who are on farms where the keeping of a farm flock or the production of sheep fits into the farming system.

Hogs.

The cost of producing pork varies considerably, but the committee worked out the following which, while perhaps not applicable to all farms, is at least a basis for discussion for those interested in hog production.

Costs of producing pork:

Overhead Costs—

Interest, 1 sow—\$30 @ 5%.....	\$1.50
Losses—2%.....	.60
Housing and Special Fencing.....	2.00
Boar Charges \$50 (Investment cost).....	4.00
Incidentals.....	.50
Total overhead for one sow per year.....	\$8.60
Total for one litter.....	4.30

Feed figured on basis of barley at average price of last five years

Overhead as above.....	\$ 4.30
Feed—885 lbs. @ 1.1c.....	9.73
Pasture— $\frac{1}{4}$ acre.....	3.00
Labor—20 hours @ 30c.....	6.00
Total cost per litter.....	\$23.03
Cost per pig—7 pigs per litter.....	3.29
Feed to grow pig from 30 to 200 lbs.—710 lbs. @ 1.1c.....	7.81
Labor—5 hours @ 30c.....	1.50
Interest, losses and incidentals.....	.60
Housing and fencing.....	1.00

Total cost of growing pig from 30 to 200 lbs.....\$10.91

Cost of Weanling.....3.29

Total cost of 200 pound hog.....\$14.20

Cost of producing pork:

One member of the committee reports that with skim milk he can produce a 200 pound hog on 650 pounds of grain. In figuring the above costs 865 pounds of grain was figured as the requirements to raise a litter of pigs up to weaning time. This is estimated as the quantity where there is plenty of pasture. Without pasture this would be increased up to approximately 1100 pounds of grain.

Another member of the committee reports that good pasture will cut the total feed requirement of producing hogs at least 50 per cent. These costs are figured on the basis of two litters per sow per year and this is high when all producers are considered. An accurate figure would probably be three litters in two years. Seven pigs per litter is higher than the state average but is the average shown on corn-hog compliance checkups.

We recommend that hog raising be considered on all farms of the county as a means of utilizing farm waste and by-products. In view of the fact that Oregon imports a high percentage of the pork consumed in the state the committee feels that some increase would be justified in the county. However, the production should not be attempted except where there is sufficient feed produced suitable for hog raising.

The committee recommends better hog housing. Particularly, that would provide a dry roof, a dry bed and good ventilation. To this might be added a suggestion that hog housing and houses be arranged to make work convenient and done without an excess of time and effort.

More alfalfa and red clover should be used for raising hogs.

More attention should be given to sanitation. Particularly in cleaning up farrowing quarters to eliminate as far as possible trouble from worm infestation. Prevention of as

much of this trouble as possible pays dividends.

The committee recommends that more attention should be paid to the type of sows that are kept for breeding. They believe that too many of the "bunt" type of sows are kept. In view of the fact that market hogs of approximately 200 pounds live weight are desired and that these should carry a nice combination of bacon and lard there are a number of hog raisers who are keeping animals that can produce the most desirable type of market hog.

The committee believes that cross-breeding produces a desirable market hog providing, first, that purebred boars are always used; second, that sows or gilts of not more than a first cross are used.

The committee recommends that more use be made of fruit wastes and that this material can well be worked into the hog ration providing it is supplemented with grain.

Horses.

Members of the committee estimate the cost of raising a colt to three years of age at \$150. They believe that the raising of colts on many farms is impracticable and that generally farmers of Washington county should consider colt raising only as replacements for their work stock and that even for this purpose it is only in instances where there is considerable pasture that it is likely to be profitable. They also believe that only the most desirable draft type mares should be bred.

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Report of the Poultry Committee

The Oregon Poultry Situation

Oregon produces a surplus of eggs above the needs of state consumption, this surplus being exported to distant markets, principally on the Atlantic seaboard and California. The major part of the commercial egg industry lies in the counties west of the Cascades.

Western Oregon is well adapted to commercial egg farming. The extent to which the industry will increase will depend upon the progress Oregon farmers make in directing their production toward the requirements of outside markets. The surplus eggs of Oregon must be of high quality in order to meet competition from other districts and to justify transportation costs to distant markets.

The industry has weathered the storm of depression in a most creditable manner and is expanding in Oregon and elsewhere as well, Oregon eggs meeting keen competition from sections near its eastern market centers. If Oregon preserves its present market outlet, or develops a real industry for which the Willamette valley is particularly well adapted, the state must change many small farm flocks into better business units.

The Washington County Situation

The poultry industry of Washington county cannot be considered a unit in itself, but must be considered in relation to the status of the entire industry. This county produces a surplus of eggs which, as a contribution to a state surplus, must be marketed outside the county and state.

The 1930 census reports credit Washington county with 3917 farms of which 3,128, or 79 per cent kept poultry; 2,714 farms had flocks with

less than 200 hens, with 414 farms carrying larger units. In 1930 Washington county produced \$1,390,455 worth of poultry and eggs. Lower values prevailed during depression years.

The 1935 census shows an increase of 454 farms or a total of 4,371. Poultry will form a part of the agricultural program of many of these new farms. It is hoped that the industry of the county will be guided in its development in such a way that the increased surplus will be from flocks whose output will meet export requirements.

Market Outlets

Producers of eggs in Washington county have the choice of selling either through established independent dealers or through the co-operative poultry producers' association. The cooperatives of the coast states maintain their own sales headquarters in eastern cities. The growers' choice of market outlets has been brought almost to his door.

Growers also have the choice of purchasing their feeds and supplies from independent dealers or co-operatively through the poultry associations.

The export demand is for white shelled eggs. This demand naturally results in the leghorn and other white egg breed dominating the situation. This does not mean the exclusion of the heavy breeds such as Rhode Island Reds, Barred Rocks and other brown-shelled egg breeds from Washington county farms.

The demand for eggs from well managed flocks of all principal breeds to supply hatcheries, both within and out of the state, should be considered by many farmers as an additional market outlet.

The Poultry Outlook

Oregon produces only 1 per cent of the nation's poultry products, and with this volume it has little voice in setting prices. Producers here operate on a margin between New York prices minus the overhead of delivering eggs of certain grade to outside markets.

The industry here and throughout the nation may expand in all phases throughout 1936 as a result of favorable prices in 1935. The probably increased number of pullets next fall will likely have a slight depressing price effect, but may be partially offset by an increased consumer demand.

Egg consumption has declined since 1932 but higher prevailing meat prices will tend to place eggs in a more favorable position.

As a result of better egg prices in the United States and a favorable foreign rate of exchange, the imports of dried, frozen and shell eggs increased rapidly during 1935. The tariff on foreign eggs was sufficient during the years of low prices and normal exchange conditions. Efforts to remedy the foreign egg import situation by trying to get an excise tax law, failed due to a lack of support. The imports for 1935 were in excess of 15,000,000 dozen shell egg equivalents.

The poultry business as a planned farm enterprise in the county is a sound business. A number of the 454 new farms—rehabilitation resettlement, and subsistence—will keep poultry. If the expansion is toward barn yard flocks rather than toward flocks large enough to justify commercial care, the state cannot long meet export market requirements. Approximately 87 per cent of the farmers who keep chickens in Washington county have less than 200 hens. These flocks are too small to justify frequent gathering, proper farm storage facilities, frequent deliveries in case lots and other factors necessary to an industry on an export basis.

The outlook of the industry depends largely upon whether or not

the farmers who keep poultry make a reasonable effort to adjust their poultry units in relation to the demands which prevail from established markets and carrying out a breeding policy that will supply stock which will meet commercial requirements.

Recommendations

1. For farms desiring small home table flocks, from which eggs do not enter trade channels, it is recommended that only flocks of two dozen hens or less be kept.

2. For the farm that plans a sideline cash income from poultry, from which eggs will go into trade channels, it is recommended that a flock of not less than 400 to 500 hens be the ultimate objective.

3. A farm that expects to derive its major source of income from poultry should develop a business unit of approximately 1500 to 2000 hens as soon as experience and capital justifies.

4. For a well-rounded specialized poultry farm program operated under natural conditions of ranging young stock, an acreage of 10 to 20 acres is recommended. Where artificial confinement throughout is practiced, less acreage is needed, but rearing under artificial confinement has been successful for a few years but is not given general endorsement.

5. It is recommended that from 50 to 60 per cent of the laying flock be replaced each year with pullets.

6. In purchasing day-old chicks, caution should be observed. They should be from pullorum-free (B.W.D.) parent stock when possible; or from accurately blood tested parent stock with all reactors removed.

7. Chicks under average conditions and equipment should all be purchased early and at one time, February, March, and April being the three months in which the big majority of Washington county chicks are purchased.

8. There are two types of brooder houses in general use by those in

the industry, each designed to overcome losses from soil contamination.

The permanent brooder house, equipped with artificial yards such as wire, concrete or board floor. (See county agent for Extension Bulletin 451). This type is, because of less labor overhead, in general use throughout commercial regions.

The portable brooder house is equipped with skids for moving to clean soil. (Extension Bulletin 451.)

9. Shelter houses closed on three sides are recommended for young stock on the range. (Extension Bulletin 442.)

10. Green feed should be provided throughout the growing period and fed liberally until the pullets are in full production. It may then be reduced in the interests of avoiding too dark yolk color. Carrots and kale are the main green feed crops supplying winter succulence with alfalfa, clover and rape supplying green feed for the summer range. Oat and vetch hay and small grains also furnish good feed during the early growing state in the spring.

11. The greatest economic loss to the poultry grower is quality of the eggs on the farm after they are laid and before they reach the grader's candle. Use should be made of basements, fruit and vegetable cellars or other storage rooms where proper conditions of temperature and humidity may be maintained. "How to Construct an Insulated Egg Room" is found in Extension Bulletin 445.

12. Extremes of temperature have shown that laying fowls do better in partially insulated houses. Plans for this type of house and others as well will be found in Extension Bulletin 480.

13. More capital is required to develop a safe poultry enterprise than the amateur anticipates. Exclusive of land and the home, and where the laying house is used for

brooding, it will require a first year cash investment of approximately \$2.50 to \$3.00 per pullet before she starts production. Of this amount about \$1.50 to \$2.00 is required for housing and from 75c to \$1.00 for cost of chick; brooding and feed of the pullet. A well-defined plan should be followed in order to give the best protection to the investment involved as there are as many hazards in poultry keeping as in other businesses.

Oregon Turkey Situation

Oregon produces approximately 700,000 turkeys, with more than half being exported to markets outside the state.

Turkey growers have adopted modern methods of incubation, brooding, and rearing in semi-confinement. Turkeys from hatching to market age are fed balanced, growth promoting and finishing feeds. The adoption of these practices has made mass production a common farm practice. The trend is toward large commercial flocks in the hands of fewer operators and a decline in number of range reared birds.

The ready sale of day-old poult has stimulated the expansion of commercial hatcheries and a demand for hatching eggs has resulted in many farms maintaining mated flocks for the production of them.

Disease factors drove the turkey industry westward in search of new and clean range land. Oregon, under natural methods of rearing, held for years a distinct advantage. As other states have also adopted artificial methods of mass production, Oregon's turkey industry must prepare to face increased competition.

Turkey shelter houses, artificial light, selecting breeders for early maturity, and northern and eastern hatcheries contracting southern winter hatching eggs for early poult are factors that result in an increasing number of early turkeys being marketed each summer and fall. This early crop is ma-

ture before the market price has been established and before the cold-storage holdings have been consumed. The industry is rapidly losing its speculative possibilities and is becoming a marginal business of narrower profit per pound of meat.

The turkey crop of 1935 had a more favorable ratio between feed cost and turkey meat prices than often exists. As a result of this favorable year, the general trend toward expansion indicated a strong possibility that the number raised may soon exceed that which the per capita rate of consumption will absorb at fair prices. The United States turkey crop increased from 14,800,000 birds in 1927 to 18,740,000 in 1934 and a further increase is expected for 1936.

Oregon turkey growers have the advantages of experience, reasonably priced feeds, climate and green feed, foundation breeding flocks, and both independent and cooperative outlets for their product. During this period of general expansion Oregon growers are engaged in a highly competitive business in which the survival of the fittest by individuals and districts ultimately will adjust the industry.

Washington County Situation

During the past few years the turkey industry of Washington county has expanded. In addition to the production of market turkeys, it has established hatcheries and breeding farms which supply poults, hatching eggs and breeding stock to many parts of the nation. Approximately 30,000 turkeys must be marketed outside of the county as a part of the export crop of the state as a whole are produced in this county.

The depression aided by the great drouth in the midwest reduced the numbers of chickens and turkeys and these causes, aided by agricultural adjustment resulted in reduced supplies of pork and other meats. Turkey growers who plan expansion for 1936 must recognize the fact that their product will

have to compete against an increased supply of chickens, turkeys and other meats. Only an improved consumers' demand can prevent a depressing effect on prices.

Turkey production is an agricultural crop for which Washington county is well adapted and in keeping with general economic conditions should be encouraged, but not exploited.

Growers have a choice of marketing their turkeys through established produce firms or through an established cooperative marketing association.

Producers also may purchase feeds and supplies either from established feed companies or through cooperative channels.

The existence of both methods of marketing and purchasing of supplies is a great factor in stabilizing the industry in the county and protecting the investments of all growers.

Nature of the Industry

The turkey business is a short term business, during periods of good prices many rushing into it and during periods of low prices there is a general exodus of marginal and loser operators. The cycle of both high and low prices is short and the business adjusts itself more quickly than many long term agricultural enterprises.

In addition to a study of economic conditions affecting the turkey industry, the successful grower is one who fortifies his business with proven management practices, knowledge of disease control, overcoming known hazards, studying his cost of producing a pound of turkey meat, and establishing ample credit.

Recommendations

1. Breeding stock should be selected early in the fall and kept separated from the market flock during the fattening periods. The breeding stock should be given a breeders' mash from early January throughout the breeding season.

in order to build and maintain a good body condition. Caution should be exercised not to allow the birds to become too fat as this condition seems to effect the fertility of the eggs.

2. Turkeys should not be reared or ranged with chickens or on ground recently used as a chicken range due to the fact that chickens are carriers of Blackhead.

3. Sufficient ground should be available to allow a rotation system which will result in a piece of ground being used as range only once in three years.

4. The cost of producing turkeys can be materially reduced by providing succulent green feed during the growing and fattening period. Turkeys are great consumers of roughage in this form. In addition to rape, alfalfa, clover, kale, and other feeds, row-crops such as corn or sun flowers should be provided for both green feed and shade on farms where natural shade is not available.

5. Turkey prices are depressed each year through the arrival on the market of poorly finished birds. No turkeys should be killed out for market until they are properly finished in both flesh and feathering.

6. Ample credit is necessary to properly grow out a band of quality turkeys. Beginners too often think in terms of profit rather than costs. The principal items of expense are: feed, poults, brooding, equipment, range, and killing and dressing. Growers should, roughly provide finances to the extent of the cost of one sack of feed for each market turkey.

7. Credit when extended to the extent of furnishing brooder houses, brooders, fuel, poults, feed and supplies to new beginners is unfair competition against established growers. It results in exploiting an industry to the detriment of all. It is urged that a general credit policy be established of extending credit only to growers who can finance their own turkeys to eight weeks of age.

8. There are disease hazards that growers must consider, the most common ones being fowl-pox, roup, pullorum;— (B.W.D.) mycosis, and coccidiosis. Each of these hazards can be controlled with a minimum of loss to the grower. Growers are urged to protect their investments by having an authentic diagnosis made of disease outbreaks as early as possible.

9. The installation or use of semi-scald equipment on the individual farm as a method of dressing turkeys which must encounter delays before reaching the consumers, should be discouraged and labelled unsound.

Joint Turkey and Poultry

Recommendations

1. The Commercial Breeder and Hatchery Code was discontinued when the N. R. A. was declared unconstitutional. The fair trade practices and provision in the code relating to misleading advertising are still in effect through a trade agreement made with the federal trade commission. We recommend that any one damaged by unfair practices submit his complaint to the Oregon branch of the International Baby Chick Association who will act as agent in pressing claims.

2. The present law relating to the disposition of dog tax license money should be amended to include indemnity for poultry killed by dogs.

3. Poultry growers should consider a plan started recently to combat thievery by

Making chicken or turkey stealing a felony.

Encourage a wider use of tattoo registered branding.

Publish each year a booklet listing names of owners of all brands and place a copy with every peace officer.

Require all produce buyers to display a list of all registered poultry brands. The present law requires all dealers to

record the number of birds of
any brand purchased.

A grower purchasing branded

birds other than his own would
have to have a bill of sale be-
fore he could sell turkeys of a
different brand than his own.

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Report of the Soils Committee

The soils committee has considered those factors that are fundamental in the maintenance of soil fertility on the now productive soils and the building up of the old cropped soils as related to all lines of farming. There are undoubtedly soil problems confronting specialized lines of production which have not been taken up in this report, but we believe that the first step in the solution of any such problem will be accomplished to a large degree by following these fundamental recommendations.

The importance of maintaining the fertility of the soil is further emphasized in Washington county because of the trend toward smaller farms. Because of this trend it is extremely important that high yields per acre be obtained in order that the smaller farm acreage may provide an adequate income to allow farm families to maintain a satisfactory standard of living.

Maintaining the Soil Fertility

The soil in its natural state contains a certain amount of plant food. The fundamental purpose of farming is to take this plant food from the soil and convert it into

commodities that may be sold from the farm. If products are to be sold this supply of plant food cannot be made to last forever. Farming practices should be followed, however, that return every possible bit of this plant food to the soil, prevent unnecessary waste of plant food, and eventually replace those plant foods removed. In general this may best be accomplished through the use of crop rotations, including legume crops, returning all crop and animal waste to the soil, providing a growing cover for the soil during the winter months, and replacing depleted elements with commercial fertilizers. It is also imperative that the organic matter supply be maintained in all soils in order to keep a good supply of plant food available in the soil.

Commercial Fertilizers.

The use of commercial fertilizers in Washington county has been increased and is increasing. Just how much money is wasted annually on commercial fertilizers cannot be estimated. These materials have their place and it is an important, one but quantities of

them are bought each year and used on crops, on soil types, and on particular land where increased crop returns could not be expected from the material used. The use of commercial fertilizers on crops planted on land that has been cropped with grain for several years without the addition of manure, crop residues, or cover crops is not likely to be a profitable practice. The proper use of these fertilizers is a specific crop and individual farm problem. Farmers intending to use them should profit from the experience of other growers and save their experimenting. The following recommendations are made.

1. Any purchase of commercial fertilizer should be based on the percentage of available plant food contained.

2. Superphosphate is giving profitable increased yields where the moisture supply is adequate when applied to corn at the rate of 200 to 300 pounds per acre. This may be applied by a fertilizer attachment for the corn planter or broadcasted as the seedbed is prepared. The latter is the preferable method.

Phosphate fertilizers have produced increased crops of alfalfa and red clover, but it is recommended that the use of this material be based upon a phosphate test of the soil in question. This may be obtained from the county agent's office and it should be understood that it perhaps is not an absolute indicator, but it is a good general guide.

Under irrigation some form of phosphate on ladino clover is, particularly after a seed crop has been harvested, advisable. Material used should carry from 40 to 65 pounds of the phosphate fertilizer element.

If a phosphorus-containing fertilizer other than superphosphate is used, probably an application of 100 pounds per acre of land plaster should be made every other year.

If superphosphate is used, this will not be necessary, since superphosphate contains an ample percentage of land plaster.

On any of our beaverdam soils potash can be depended upon to increase the yield of practically any crop. Quantities used vary from 200 to 500 pounds per acre.

Lime.

Lime generally is recommended on land where alfalfa is to be grown. There are specific fields where the use of lime is unnecessary, but these are not general. Applications of lime should be based upon an acidity test which can be obtained through the county agent's office and it is recommended that contact with that office be made before applying lime.

Ground limestone at the present time can be obtained from the State Lime Plant at Salem at \$6.25 per ton f.o.b. the car, in carload lots at all points in Washington county except on the Tillamook branch where 15 cents per ton additional freight must be added. Ground limestone is available from other sources at a price varying from \$6.40 per ton in 10 ton lots to as much as \$12.00 per ton for an east-of-the-Cascades product.

These various limestones vary in analyses of calcium carbonate from 72 per cent to as much as 98 per cent, and the price paid per ton should be based on the percentage of calcium carbonate contained.

This committee recommends the use of ground limestone where lime is required to correct an acid condition of the soil.

Lime should be applied in the fall if results are to be expected on the next crop.

Landplaster.

Washington county soils generally have a very small supply of sulphur. Legume crops draw heavily on this supply, consequently increased yields are generally secured by applying fertilizers containing

this element. Where sulphur alone is needed, this may be applied cheapest in the form of landplaster. Applications of landplaster varying from 80 to 125 pounds per acre are recommended for all legume crops such as clover, alfalfa and vetch. This should be applied as a top dressing in the early spring.

In some cases it may be desirable to apply superphosphate to these crops and where this is done the application of landplaster will not be necessary.

Crop Rotation.

On the general farm in Washington county the productivity of the soil may best be maintained by following a crop rotation including some legume crop. The type of legume to grow will depend upon the soil type on the individual farm and the type of farming followed. These legume crops are necessary in order to maintain a supply of nitrogen in the soil and to build up a good supply of organic matter which results in increased yields of succeeding crops.

Wherever there is very much livestock on the farm, it is a good practice to rotate a semi-permanent pasture over the farm. It is suggested that wherever possible a system of rotation should be worked out so that each portion of the land on the farm could be in pasture once every 15 to 20 years. This would allow the soil to build up a good supply of organic matter and available plant foods.

Cover Crops.

Cover crops are absolutely necessary for the maintenance of soil fertility in orchards. Common vetch at 50 to 60 pounds per acre, with 40 to 50 pounds of winter grain, barley preferred, is a mixture this committee feels justified in recommending. Crimson clover is sometimes used with considerable success by individual orchardists. Rye, turnips, or mustard may be used as cover crops where it is difficult

to obtain good stands of vetch. The committee feels, however, that the winter grain and vetch cover crop, under general conditions, is safer than crimson clover, and is better than the other crops mentioned.

Cover crops are necessary in order to prevent the loss of available plant food by leaching during the winter months, to maintain a good supply of organic matter in cultivated fields and to prevent actual loss of soil by erosion.

Erosion.

Erosion is becoming a serious problem in Washington county, especially on the hill soils. It is especially serious where cultivated crops such as orchards, potatoes, and berries are on the steeper lands. Where at all possible, those soils should be provided with an adequate cover in the form of a cover crop during the winter months. Where it isn't possible to grow cover crops, erosion losses may be prevented to some extent by having the rows run across the slope rather than up and down the slope.

On general farms, ordinary good farming practices usually will prevent erosion losses. Care should be taken to keep up a good supply of organic matter in the soil and to see that the soil is not left unprotected during the winter months. Where winter grain is sown on steep land it should be sown as early as possible and it should be drilled with the drill rows running across the slope. The continual practice of fall and winter plowing previous to spring seeding on hill soils should be discouraged.

Some of the shallower hill land which is now worn out and low in organic matter might better be seeded to permanent pasture than to be farmed every year.

Straw.

Washington county produces cereal and seed crops with straw residue on approximately 45,000 acres

annually. Burning of straw has become a not very general practice except in the case of certain seed crops where burning may be of some benefit in controlling insect pests. The following recommendations regarding straw are made:

1. More straw should be used as bedding.

2. Straw should not be burned except when necessary to control crop pests.

3. Straw is a valuable soil builder in supplying organic matter and plant food, and can be spread on the land properly.

4. Lounging sheds for stock where the manure or straw is hauled out in the spring is recommended.

5. The plant food in a ton of straw, if figured at current prices for nitrogen and phosphorus and potash fertilizers, would cost \$1.90 for grain straw, \$3 to \$4 for vetch and \$6 for clover and should not be wasted.

Investigation is needed on the possibility of adding additional nitrogen to non-leguminous straw to hasten the rotting of such straw and make better use of the organic material in it.

Manure Storage.

The loafing or lounging shed is recognized as one method of conserving barnyard manure.

A liquid manure tank may be used to advantage in combination with either the loafing shed or in connection with the usual barn. Liquid manure tanks in some places have been constructed allowing approximately 75 to 150 cubic feet of tank space per animal. This is adequate for a four or five months period.

Sprinkling superphosphate on the floor of a horse stable and in the gutter of the cow barn is a practice this committee recommends.

Manure is particularly lacking in the one plant food element commonly needed, that is phosphorus. Superphosphate has been used in this manner with good results and increases the value of the manure in two ways.

Drainage.

Wherever tile drainage is installed the system should be carefully designed according to the area of land to be drained and the soil type involved. Before any tile is installed it is best to have a drainage system in mind covering the whole farm even though it is possible to install only a few tile at a time. This will eliminate the necessity of duplicating tile line or digging up and relaying any tile. In this connection the committee recommends that in designing these drainage systems individual farmers make use of the assistance available through the county agent's office.

Wherever it is impossible to install this drainage either because of inadequate outlet, soil type, or lack of finances, very often some drainage improvement may be made by the use of open ditches in order to allow the surface water to be carried away.

Irrigation

During the past five years the irrigated acreage has increased from only a few acres to 400 acres in 1935 with indications that there will be nearly 700 acres in 1936. Most of this area is devoted to irrigated pasture. This trend indicates that irrigation is a sound practice in this section. The committee feels that this acreage should be expanded to the extent of the available water supply.

Irrigation in Washington county will be limited, due to a comparatively limited supply of water. There is more land adjacent to streams that might be irrigated than there is water in the streams to irrigate with.

Farmers using ladino clover under irrigation have consistently carried not less than three cows per acre throughout the spring, summer and fall. Seed crops from ladino clover plantings have not averaged as high as hoped, but have been profitable. In some cases pasturing has been carried on too long with the result that it is difficult to get the crop dry enough to hull so that all the seed could be saved. This committee would recommend that if a seed crop is to be harvested that it be irrigated not later than July 10 to 15.

Where ladino clover is to be seeded alone this committee would recommend seeding just as early as the ground can be prepared. Broadcasting is generally the more preferable method of seeding and is usually done at the rate of three or four pounds per acre.

In pasturing irrigated ladino clover there should be at least three and preferably four pastures. This makes possible rotating the stock from one pasture to another thus increasing the carrying capacity, lengthening the life of the stand, improving the quality of the seed, and facilitating the application of irrigation water.

Application of water to red clover has not increased the yield of the first hay cutting, but on the John Thornburgh place in 1935 the use of the water increased the seed production just about an even 300 pounds per acre.

Sweet corn and lima beans have both been irrigated in this county. Yields of sweet corn have been increased with water. Just how much the water will increase the yields of sweet corn has not been conclusively shown, but on the W. T. Putnam farm in 1935 the yield of sweet corn ran as high as five tons per acre on the best part of the patch, where for the most part it would not have been possible to have raised a crop at all without the water, due to late plowing and late preparation of the land. This

committee recommends that water be used with caution on lima beans as they believe the use of irrigation on this crop has a tendency to make the development of the beans uneven when exactly the opposite is desirable.

String beans and potatoes have been irrigated in this county very profitably on a commercial basis. Alfalfa has also shown increases in yield. The committee feels that the application of irrigation water would be of benefit to most crops expected to grow throughout the four summer months. Whether or not irrigation of any crop would prove profitable can only be told after a careful consideration of the costs involved as compared to the expected increases in return.

Methods of Irrigation.

More experimental work is needed as to the amount of and method of water application. Land should be properly prepared for irrigation using the strip border system for field crops wherever it is possible to do so. Sprinkler systems are recommended only for special crops and on ground that is too rough to permit surface or flood distribution.

Pumping Plants.

All irrigation projects, pumps and power systems should be designed to fit individual conditions, pumps particularly should be designed to fit the particular job they are to do. Pumps should be purchased on a basis of the amount of water required, total pump head and the power that is available.

Generally, second hand pumps should be avoided.

Pipes, either suction or discharge, should be of adequate size to allow passage of the water without undue friction loss.

This committee particularly recommends that farmers consult the county agent in regard to their selection of irrigation plans to be

sure they are providing themselves with:

1. The plan adapted to their needs.
2. That they have an adequate and proper pumping plant.
3. That the land is desirably prepared.
4. That they have a size of unit that is practicable.

Along the Tualatin river care must be taken to get pumps and power units on a firm foundation. In nearly every case that a unit has been set up close to the water on the river bank, the owner has found that sooner or later the bank starts slipping, sometimes disastrously.

If irrigation is to be used, it must be recognized that more fertilizer, both manure and its equivalent in crop residues and commer-

cial fertilizers, must be used. If crop yields are increased by the use of water, the drain on the fertility is heavier and this must be replenished.

Use of water for irrigation on any farm should be protected by a water right filed through application with the state engineer at Salem.

Irrigation water should be applied according to crop requirements. No crop grown under irrigation should be allowed to stop its growth because of lack of moisture. A common mistake where land is irrigated is that the first irrigation is delayed too late in the spring. Experience has shown that the irrigation plant should be ready for operation by the first to the fifteenth of May, although some years it may not be necessary to apply water until after the first of June.

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