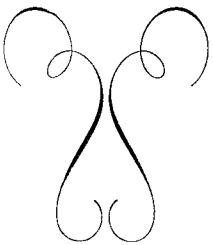
Benton County Agricultural Outlook Conference



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FOREWORD

The cooperation of Corvallis businessmen has made possible the publication of this report of the Benton County Agricultural Outlook Conference, held in Corvallis, February 6 and 7, 1936. The Corvallis Gazette-Times, first publishing the report as news, held the type for the purpose of publishing this report in bulletin form.

Additional funds necessary for the publication of the report have been furnished by the following business firms:

Atwood and Mills Grocery
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Winkley Creamery Company

The purposes of the conference were to gather accurate and detailed information on the local and national phases of agriculture and horticulture, to present this information in concrete and definite form, and to make recommendations based upon information furnished by the respective committees.

Recommendations of the conference constitute the best opinions of committees composed almost entirely of practical producers of Benton County. The report forms a guide for Benton County agriculture.

The various committees spent much time on their respective work, sifting the more valuable suggestions in the formation of their reports. Notwithstanding all this careful endeavor on the part of the committees and the fact that the best available data was used, the recommendations of this report should not be taken as final. Conditions are constantly changing and in accordance with these changes the recommendations in this bulletin will need revision and adjustment during succeeding years.

A program has been developed by the Benton County Agricultural Outlook Conference for the guidance of the county's agriculture. The value of the sessions will come from the intelligent use of its findings by the individual producers and organizations throughout the county.

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Benton County Agricultural Outlook Conference

ECONOMICS BODY MAKES SUGGESTIONS

The economics committee considered five topics believed to be of importance to the welfare of Benton county and Benton county farmers. They are: farm credit, farm practices, land utilization and use, farm taxation and farm accounts.

Recommendations of the committee on each of these subjects are as follows:

Farm Credit Rates May Increase

(1) During the past few years farm credit terms have been liberalized and interest rates have been reduced. The interest rate on federal farm mortgage loans has been lowered from a high of 5 per cent to 3½ per cent, but will be raised to 4 per cent in July, 1936. Land bank commissioner loans now are made at 5 per cent with no principal payment for three years. These loans largely are second mortgages, but in some instances a chattel mortgage is taken for crops and livestock. Production credit loans are available at 5 per cent. It is the belief of this committee that within a few years this condition will be reversed, and interest rates will increase.

(2) In general established farmers are advised to liquidate present debts as rapidly as possible. There might be cases where a farmer would be justified in borrowing additional money for the purchase of livestock, where he has a large amount of range that otherwise would go to waste, or where he has sufficient feed and shelter for additional stock that he wishes to market, or where the farmer has a large amount of stock and finds it necessary to buy additional feed and range to carry them through to a satisfactory market. It is recommended that the farmer borrow for seasonal requirements, but not at this time borrow for long periods particularly if he has a complete farming unit.

(3) Although farm prices are low, worthy young or older farmers, who through misfortune or otherwise have lost their farms, have an excellent opportunity to reestablish themselves. Attractive prices and reasonable terms prevail for the purchase of farm property from insurance companies and other lending agencies who have acquired these lands through foreclosure. They should, of course, have ability and some resources. For farmers without commercial credit the resettlement administration, a government agency, will advance funds for the purchase of livestock, equipment, feed and other things necessary for the proper management of a farm, providing a workable program is presented to the administration office. Farmers in better financial condition may deal with the Willamette Valley Production Credit Association with an office in Salem. Money is loaned at 5 per cent on crops, feed, livestock, farm equipment, and produce.

(4) No set rule for the purchase

of farm property can be recommended, but any farmer contemplating buying a farm should have a definite workable program; and his payments should be in line with his anticipated income for an average year.

(5) A newcomer before acquiring any appreciable amount of indebtedness should acquaint himself with the district and have some knowledge of how the money is to be repaid. Prospective purchasers also should make inquiry of county agents, leading farmers, chambers of commerce, and other qualified persons or institutions concerning the productive capacity of land they intend to buy.

(6) It would be to the advantage of the farmer to place all long time indebtedness on an amortizing basis with a plan to pay as rapidly as his income will permit.

(7) Existing federal agencies established for extending credit to farmers; namely, the Federal Land Bank, the Willamette Valley Production Corporation, and the Resettlement Administration, together with the assistance of local banking institutions, amply cover all credit needs. Further credit facilities are not needed at this time.

(8) The recommendation of the various government agencies to not increase production is good advice. Long– or short time borrowings for this purpose should not be made unless such action is necessary to develop the farm into an economic production unit.

Changes Suggested for Farms

(1) High yields are essential to good profits. Numerous instances where the tillable land of Benton county has ceased to be profitable because of the cropping practices followed. Farmers of this county are urged to give added attention to crop rotation and the use of crop residues in order to conserve the fertility of their farms and maintain crop yields.

(2) An improvement in Benton county agriculture might be possible if farmers would standardize on a few well adapted crop varieties instead of producing the wide mix ture as they do now. There appears to be a need for pure strains of seed for these adapted varieties.

(3) Where farmers buy seed, the exact variety of which is not definitely known, they should make use of the seed testing facilities of the Oregon State Agricultural college to determine accurately the variety purchased.

(4) All livestock producers in Benton county are urged to give serious attention to selection of sires for their flocks and herds. High producing profitable livestock cannot be produced from scrub sires.

(5) Frequently farmers make a practice of producing small acreages of specialized crops for which they do not have adequate machinery or else have ample machinery but do not use it on enough acreage to justify the investment. Farmers are asked to try standardization of their farm operations so they can obtain and afford the proper equipment.

Land Utilization Is Not Efficient

(1) According to the census Benton county contains 440,320 acres of land, 96,467 acres being improved land. Much of the remainder is not suitable for agriculture regardless of the development to which it may be subjected. Yet hopeful settlers have in the past and again in the future may try to make farms out of this non-agricultural land. Lands of Benton county should be classified to ascertain which are suitable for agriculture. This classification should

cover all privately owned, federal, and county lands offered for agricultural settlement.

Following this classification county officials should be given authority by the state legislature to zone these non-agricultural areas so further settlement could not occur. Considerable saving in school and road costs should be possible if this plan is put into operation.

This committee further wishes to go on record as opposing the opening of federal lands to further homesteading unless a classification is made which proves that these lands can be developed into self-sustaining farm units.

(2) The number of farms in Benton county has practically doubled since 1900. There has been a limited increase in the improved land in farms, thereby resulting in smaller farms. It is believed that further subdivision of improved lands is feasible in Benton county to the extent of developing 100 to 200 new farms. There also appears to be opportunity for clearing additional river bottom lands. A suggested economic farm unit for the various major soil types is as fol-

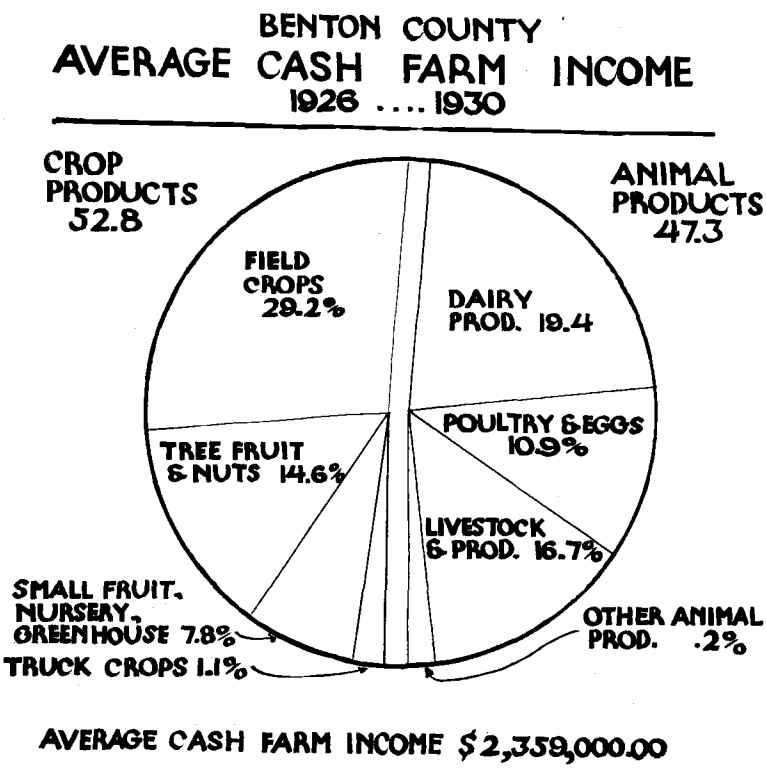

Figure 1.

lows: Chehalis series, 80 acres; Willamette series, 120 acres; Amity series, 200 acres; Dayton series, 300 acres. New farm units which may be created by subdivision should conform to these sizes.

(3) Benton county has no further opporunities for part-time farmers at the present time. City people contemplating part-time farming usually will do better with a small acreage or rural residence type of place than with a small farm which requires power and machinery to operate.

(4) Benton county now has several thousand acres of cut over and burned over forest land which has neither a good grass nor forest cover. As logging continues additional areas of such land will become available. If a good grass cover could be established economically on these lands it would provide pasture for livestock and prevent erosion until such time as tree growth reestablishes itselif. State and federal forest and agricultural research agencies should study this problem for the purpose of ascertaining the feasibility of seeding these lands to grasses.

Farm Taxation in Oregon Burdensome

The present tax on real property has become very burdensome to farmers. For the 1934 taxes the tillable lands of Benton county were assessed on the average of $36.51 per acre. At a rate of 32 mills which was approximately the average rural rate for that year the tax per acre of tillable land was $1.17. The gross cash income per acre for the period 1926-30 amounted to $25 per acre of improved land but in 1934 was approximately 60 per cent of this amount or $15 per acre. It is estimated, therefore, that farmers were paying a tax of approximately 7.8 per cent of their gross income at that time. This was an intolerable situation and as yet is not greatly improved. A balanced tax program should be adopted in Oregon which will alleviate this situation.

Farm Accounts Are Essential

Farm accounts are a great aid to more intelligent farming. It is recommended that farmers give added atention to keeping farm records. Farm accounts books are available from the Oregon Agricultural Extension Service. One of these books sells for 25 cents and is designed for complete farm accounts, and the other is for budgets and inventories. It costs 10 cents and provides space for entries over a five-year period.

SEED CROPS ADVISED FOR BENTON

Farmers of Benton county should look to the possibility of producing small seed crops. There also is an opportunity to develop markets for certain vegetable seed crops. Already there is a market for some small seeds, particularly hairy vetch, which depends largely upon the demand for cotton, since the primary market is in the south.

Small Seed Production Has Promise in Benton County

Hairy vetch is a crop that has proven fairly profitable for the last five years, but due to the uncertainty in the price of cotton and the increased acreage of hairy vetch, there is some question as to whether it will continue to be profitable.

Because of shattering, it is not advisable for one person to attempt to grow more than 50 to 75 acres if the vetch is to be handled with one harvesting machine.

If a grower is depending upon renting harvest equipment, arrival of which is uncertain, it would be best to bind and shock the vetch, if enough is standing to make this possible, or mow and shock the crop if it cannot be bound.

Growing costs will range from $15 to $26 per acre. Average yields in Benton county have been from 300 to 350 pounds. Considering the average prices for the past three years most growers have been getting their cost of production, but if the price should decrease to any extent, losses would occur on the low yielding fields.

The cost per acre of seeding, harvesting and overhead for hairy vetch is shown as follows in Tables 1, 2 and 3.

The present Willamette valley acreage is large enough and growers should study cotton prices and in those seasons when cotton promises to be low should reduce hairy vetch acreage wherever possible.

TABLE 1. COSTS PER ACRE OF SEEDING HAIRY VETCH

	Seeding on Spring Stubble	Seeding on Fall Plowing
Plowing	$ ..... —	$1.50 — 2.00
Harrowing	.30 — .90	.30 — .90
Discing	.60 — 1.00	.60 — 1.00
Rolling	..... —	.50 — .75
Drilling	.50 — .50	.50 — .50
Land Plaster—50 pounds to 75 pounds	.40 — .40	.40 — .40
Cost of Seed—30 pounds at 8 cents	2.40 — 2.40	2.40 — 2.40
Total	$4.20 — 5.20	$6.20 — 7.95

TABLE 2. HARVESTING COSTS PER ACRE FOR HAIRY VETCH

	Binding and threshing	Mowing swathing, and combine	Combine alone	Mowing, swathing, shocking, and threshing
Sacks and twine	$ .94	$ .94	$.....	$ .94
Twine	.35	.....	.....	.....
Binding	1.00	.....	.....	.....
Shocking	.40	.....	.....	1.20
Hauling to thresher	1.00	.....	.....	2.42
Threshing	2.50	.....	.....	4.26
Mowing and swathing	.....	.75	.....	.75
Combine	.....	4.00	5.00	.....
Total	$6.19	$5.69	$5.00	$9.57

TABLE 3. OVERHEAD COST PER ACRE FOR HAIRY VETCH

Interest on land—5 per cent on land values $60 to $100	$3.00	—	$5.00
Interest on machinery—5 per cent (Covered in costs of production)	.....	—	.....
Depreciation on machinery (Covered in costs of production)	.....	—	.....
Repairs on machinery (Covered in costs of production)	.....	—	.....
Taxes on land and equipment	1.30	—	1.30
General farm overhead	2.00	—	2.00
Total	6.30	—	8.30

Hungarian vetch during the past few years has enjoyed an increasing demand, clean seed being much in demand. Yields of 750 to 1500 pounds per acre may be expected. Hungarian vetch is winter hardy and can be cut for hay if prospective seed prices or yield do not justify threshing.

Austrian winter field peas, during recent years, have been an important crop in Benton county, but due to the difficulty of controlling the pea weevil the crop has lost its position of importance. Satisfactory yields may be obtained if winter field peas are grown under conditions similar to those of hairy vetch, and provision must be made for fumigation immediately after threshing. In localities where pea weevil damage has not been serious, peas are proving a successful crop.

The market for peas and vetch is identical and everything said about vetch price prospects applies to the peas. Peas shatter if left in the field.

English rye grass should be of the New Zealand strain, there being a good market for certified seed. In 1935 100,000 pounds were grown in the Willamette valley in addition to 500,000 pounds that were imported. The plant is long-lived, there being stands in the Willamette Valley 14 years old. One six year old field at the Oregon Agricultural Experiment Station continues to produce good seed crops. Seed only on clean ground due to a tendency to cross-pollinate with Domestic rye grass thereby destroying and impairing purity. The average yield to date has been 415 pounds per acre. English rye grass is one of the best grasses, probably the most palatable of all common grasses.

Orchard grass grown in Oregon finds serious competition in seed from the middle western states. At the present prices Oregon growers must have a yield of 300 pounds or more per acre to make the crop profitable. The average yield to date in Benton county has been 236 pounds per acre. The outlook is doubtful and if grown, the seed bed should be on the better types of soil.

Tall oat grass seed now being used, most of which is shipped from Virginia, is poor in quality. For the past 17 years the average yield of this seed at the Oregon Agricultural Experiment Station has been 217 pounds per acre. Although the demand is increasing the crop should be grown only in amounts which can be handled quickly as it shatters badly.

Chewing fescue is now grown only in Western Oregon and Washington centers for domestic seed production. Imports for the last 10 years have averaged 1,013,300 pounds but domestic production has averaged no more than 1000 pounds. Fescue should be grown only on the best types of land as free as possible from weeds. The average yield of domestic seed has been 100 pounds per acre, prices good and germination better than imported seed, thus showing promise as one

of the best possibilities in Benton county.

Land on which fescue is planted should be summer fallowed to clean it of native grasses, particularly rat tail fescue which is difficult to separate.

Italian rye grass (common rye grass) market for the past year has been dull, largely due to the fact that timothy, orchard grass, and Kentucky blue grass have been low in price and have been used in preference to Italian rye grass, especially in northern states. The future depends largely upon supply and demand.

Canary grass is being produced in large amounts in Minnesota, Wisconsin, and Iowa. The saturation point appears to have been reached with average yields in these states of 75 pounds to 100 pounds per acre and improved methods of harvesting by machinery providing an unsatisfactory outlook for this section. The only possibility in seed production is in the New Highland strain which has been developed on the State College experiment Station farm.

Approximately 5,000 acres of land in Benton county now producing practically nothing could be improved if stands of Reed canary grass were secured. With seed relatively cheap the first time in history, now would be a good time to get low land, swales, and overflow land into production because this land in Reed canary grass will produce nearly as much pasture per acre as good irrigated pasture. In a pasture survey by the State College Reed canary grass pastures in the Willamette Valley have cost three cents per dairy cow per day as compared with costs from two to ten times as much for other types of pasture.

Sweet clover has local demand only at the present time, that being centered on the stem-rot resistant strain. With stem-rot fungus not prevalent in other states local seed is of no more interest to them than

Figure 2. Stem rot resistant clover shown in contrast to common variety, shown in foreground. Note the fine growth of the stem rot resistant clover in the background.

the seed they already are producing. This clover is advised as a seed crop only on small scale for local consumption but it is one of the best pasture crops.

On well drained lands deep enough for it to grow sweet clover is the best soil improving crop available, even better than alfalfa. If seeded in the spring with rape at the rate of 12 pounds of clover to three pounds of rape the amount of pasture the first year is greatly increased with very little extra expense.

Crimson clover imports for the last 10 years have averaged 3,416,500 pounds. The average yield for this vicinity has been 700 pounds per acre, although only a small amount is grown locally. If produced in sufficient quantities for car lot shipments there could be good sales to southern states for cover crops although there is little opportunity for a large profit crop.

Sometimes crimson clover seed is very cheap due to large crops. It must be harvested with a huller rather than a threshing machine.

Red clover, using the Tennessee or anthracnose resistant strain, seems to be the most promising for seed production. In recent years Benton county growers have found this crop unprofitable for seed production.

Alsike clover may be grown successfully on soil too wet for red clover, although it will return high yields on better soils. There has been a comparatively uniform demand for Alsike seed.

Meadow foxtail shows promise as a wet land pasture grass, a small amount now being produced. The price is relatively high due to the fact that the seed is hand picked, no machinery having been perfected which will harvest meadow foxtail seed. An abundance of foliage is produced, the crop thriving where the ground is covered with water for long periods during the winter.

This grass is recommended as a pasture grass but not as a seed crop at present because it is not well enough known.

Kale is used mostly as a dairy and poultry feed, the common variety being Thousand-headed kale. The seed is planted comparatively early in beds during the spring and plants are reset in the field. Kale compares very favorably with corn silage as a feed for dairy cattle and normally will withstand a temperature of 13 or 14 degrees above zero before being seriously damaged.

Rape seed used in the United States is imported at the rate of 5,000,000 pounds annually, indicating the possibility for domestic rape seed as a cash crop. If a group of growers would grow rape as a regular crop and advertise it a good market might be developed.

Increased Acreage Advised in Benton

Generally seed crops are suited to the larger farms where adequate machinery can be owned. The industry depends to a large extent on tariff protection and granges and other farm organizations are urged to do all they can to keep the protection now available and to get it increased at the first opportunity. Eastern seed dealers and growers have no particular interest in maintaining tariffs and if they are to be continued local support must be given to the activity for protective tariffs.

In Benton county the acreage of the following crops could be increased profitably at present: rape, kale, chewing fescue, tall oat grass, and pasture types of English rye grass.

The acreage of the following is large enough for the time being: hairy vetch, Hungarian vetch, Austrian field peas, Italian rye grass, and canary grass. The other types of seed either have a very limited market or have not produced well in the county.

Changes in demand sometimes occur so suddenly that next year recommendations for acreage increase or decrease might be different, therefore new settlers or those contemplating seed production should consult with the county agent before embarking upon any new venture.

Grains Have Future for Local Consumption

Corn is being shipped into the northwest and Benton county although profitable yields of corn can be secured on the better soils of the county. Experimental data shows that corn can be dried artificially for $3.46 to $4 per ton. Earlier maturing varieties of corn may be grown, stored in ordinary cribs, and used for hog feed.

Well dried corn usually has a price advantage of $5.00 to $8.00 per ton over oats and barley. An advantage on the small farms is that farmers can produce it without owning or renting binders, grain drills, or threshing machines.

Wheat in Benton county has not been produced in sufficient quantity in the past few years to supply local demands. Because of the cost of production only enough wheat be grown for local demand. Farmers should standardize on the varieties of wheat produced.

Barley is a good feed and at least enough should be grown to supply local demands. Hannchen is a good spring crop and also may be sold to brewers. Special handling is necessary when barley is grown for brewing purposes. A good winter variety is OSC No. 7.

Oats are an important part of most livestock and poultry rations. Grey oats for winter and Victory oats for spring, with some other varieties adapted to special soil types are suggested. A small eastern market has been developed for Victory oats although at the present time this market has not developed enough to justify much increase in acreage. There is a better out-of-state market for oats than for barley, grey winter oats being also shipped east for seed and milling.

Hay—alfalfa, red clover, vetch and oats are the standard hay crops in Benton county. There should be very little if any increase in the acreage of hay as the present acreage is enough to supply the local consumption and there has been a comparatively small outside market for hay. Some shift might be made from other legumes to Grimm alfalfa.

Only 15 per cent of the hay acreage of Benton county is seeded to alfalfa although some of the other hay acreage could give way to alfalfa on those soils adaptable to it. Advantages over other crops are:

It is permanent (seven to ten years).

It is higher in feeding value for dairy cows.

It furnishes green pasture late in the summer when most needed.

Once a stand is secured there are no crop failures.

It averages higher in yield than other hay crops.

If sold from the farm it usually has a $1 or $2 per ton price advantage.

It is more valuable for soil improvement than other hay crops.

Benton Land Adaptable to Flax

Flax for fiber or seed seems to offer some promise in this county and farmers are urged to keep in touch with flax development. They might raise some fiber flax where hauling distances are not excessive, seeding comparatively early on well prepared ground, and using a proven variety.

COUNTY DAIRYING IS STRONG

One-fifth of the agricultural income for Benton county is derived from the sale of dairy products. There has been a gradual increase in the number of dairy cows in the county since 1890 when there were 3,915 cows two years old or over. On January 1, 1935, it was estimated that there were 6,200 dairy cows two years old or older in Benton county, the increase in the number of dairy cows in this county being somewhat more rapid than the average for the United States. This is to be expected in view of the fact that the population in the western states has increased more rapidly than has the population in the nation as a whole.

The demands of the population in the United States kept ahead of the supply of dairy products until 1932 and 1933 when, due to increased number of cows, increased production, and a lowered consumer demand, a definite and clear cut surplus of dairy products was accumulated. Because of the rapid increase in the number of cows in the United States from the period beginning 1929, it is probable that even if normal consumer demand had prevailed, there would have been a definite drop in the prices of dairy products.

Local Markets

The 11 western states market their dairy products within these same states. For a number of years there have been a few less cows per thousand of population than in the rest of the country, and consequently all of the dairy products produced in the western states, except occasional instances, have been consumed within these states. This has meant that the price level for dairy products has been at least the freight differential between Chicago and west coast points higher than the Chicago market.

In the case of Oregon, however, a definite surplus is produced, and Oregon producers must bear the cost of freight from Oregon to California and Seattle markets. If the 11 western states increase their production above the demand within the states, then they must ship the surplus east, and naturally the price level will drop to absorb the freight.

According to the Agricultural Outlook Report for 1936, no great prospect of a material change in the numbers of dairy cattle can be expected during the next year or two, although there may be an increase two years from now. At the present time, the prices for dairy products are still relatively low as compared with the price of veal, beef, pork, and feed grains. If there should be an unusually large supply of feed grains available, and the price of these grains fall, there may be a tendency for dairymen to feed their cows more heavily and consequently increase production from the same number of cows. This might be offset by increased consumer demand brought about through an increase in industrial pay rolls, as there seems to be a

direct correlation between pay rolls and the price of butter which usually controls the price of other dairy products.

It appears that the dairy industry, throughout the county and in the 11 western states, seems to be fairly well balanced at the present time. It must be recognized, however, that any too rapid increase in the number of cows, or in liberal feeding, or a slackening of consumer demand or both of these major causes might possibly disturb this balance.

Benton County Herds T.B. Free

There appears to have been only a slight expansion of the dairy business in Benton county. The dairymen have done an efficient job in their business and the county has been accredited free from tuberculosis for many years. Rapid progress has been made in testing for Bang's disease. A survey of approximately 100 herds indicates that the average production per cow has been raised during the last 10 years from 140 to approximately 170 pounds of butterfat. This increase largely has been due to dairy herd improvement, better feeding, and management practices. Many dairymen in Benton county have improved their sires and feeds.

The manufacturing facilities located in the county are more than adequate to take care of all the production for years to come.

It is believed that dairying is a sound enterprise for Benton county, and that its further development should be encouraged. This development should be based upon sound practices of dairy cattle management and low production costs.

1. Dairy Cattle Improvement

(a) High producing cows produced at lower costs. The dairyman who desires to develop a herd of high producing cows must constantly cull the low producers on the basis of production records. This may be done either through a herd improvement association or by individual effort. The Linn-Benton Herd Improvement association should be expanded to complete a full year of testing and every effort made to develop interest in the improvement of dairy cattle to a point where an association can be maintained in Benton county alone. A special committee could assist the county agent in this enterprise.

The dairy committee believes that there may have been undue emphasis placed upon high production per cow without sufficient emphasis having been given to the problem of economical production.

(b) Proved sires. Proved sires should be developed in the herd improvement association. A program which will result in proving at least five sires each year should be adopted by the association.

Many small dairymen find it difficult to own a good sire because of relative high cost per cow. It is suggested that the joint ownership of sires by small groups, or that a group of two or three, each owning a good sire, arrange to exchange every two years, are two methods by which the owners of small herds may secure the service of good sires.

The second suggestion also permits the "proving" of sires.

2. Hay Quality

Much good hay is spoiled each year by poor curing methods in Benton county. The common faults are late cutting and slowness in moving the hay out of the swath, and also out of the cocks. Both of these faults result in a hay of very low quality for milk production.

Dairymen wishing to get cheap production from their hay must supply their cows with good hay, cured with a minimum loss of palatability.

More alfalfa can be raised in this county and increased production is urged as it is the best hay known for milk production. Where it cannot be grown, clover or oats and vetch should be raised for the dairy cows.

3. Succulent Feeds

It is believed that good dairy practice provides at least 25 pounds of succulence per cow per day during the time no pasture is available. This can be in the form of silage, roots, or kale. The use of kale is strongly urged, although there is a relatively small weather hazard. Enough should be planted to take care of the milking herd on each farm until at least January 1 of each year.

4. Pastures

There is the possibility in many parts of Benton county for the further development of irrigated pastures. Ladino clover has given excellent results. Willamette valley sweet clover, a new root rot resistant variety, makes excellent pasture on soils suitable to the growing of alfalfa. It is recommended that extensive trials of this pasture be put out.

Sudan grass planted on warm, well-drained soils makes an excellent late summer soiling and pasture crop on lands not suitable for irrigation.

Alfalfa can be used either as a hay crop or, where it grows throughout the summer, many farmers are finding it valuable for pasture after the first or second cutting is taken for hay.

Cows on Ladino clover, sweet clover, or alfalfa pasture should be watched carefully for bloat, especially when they are first turned onto this type of pasture.

5. Management

The committee has no desire to suggest to anyone how large to develop his business. At the same time committee members believe they are justified in suggesting that those who desire to engage in the dairy business as an important part of their farm business should not overlook the relation of production costs to the size of the herd.

The number of dairy herds in Benton county according to size are listed as follows:

	Number of herds	Percentage of total herds
1-3 cows	485	41.5
4-5 cows	162	13.9
6-12 cows	319	27.3
13-20 cows	119	10.2
21-50 cows	70	5.9
More than 50 cows	13	1.1
Total herds	1,168	

Heifer market seldom good. Many dairymen have been raising a surplus of dairy heifers for sale to out-of-state buyers. Cost of production figures gathered by the Oregon Experiment Station indicate that in the average year the market value of these heifers at freshening time seldom equals the cost of production. Except on those farms that have exceptionally low cost of production and can produce quality stock that will sell at a premium, it is recommended that only sufficient heifers be raised to replace normal culling. This recommendation would not be applied to pure bred breeders of high quality stock whose efforts should be encouraged.

6. Marketing

There are some practices in the present system of marketing upon

which the committee desires to comment:

(a) It is believed that there is a great waste of efficiency in the present methods of gathering the raw products from the farms. Routes overlap, this form of competition being expensive to the operators and, as usual, eventually is paid for.

HORTICULTURAL PRODUCTS VARIED

The soils suggested for tree fruits and nuts should be six to ten feet deep and well drained. Orchards occasionally may prove profitable on shallower soils but generally with orchards on shallow soils, those underlaid with rock or hard pan, and soils with high water tables, the growers are faced with serious production and financial difficulties early in the life of the tree. These difficulties are more pronounced during dry seasons. Many development projects in the northwest have undergone similar experiences.

Orchard soils need additions to the humus supply, generally to assist with the maintenance of soil fertility, and also as an important aid to preventing soil erosion. A cover crop is practically a necessity in maintaining the per acre production of high quality fruit.

10 Tons of Cover Crop Per Acre

Ten tons of cover crop per acre annually in addition to its root system ranks first as an aid in the soil maintenance program. Additions to cover crops that aid in soil maintenance and erosion are:

Stable manure, 10 or 12 tons per acre, applied annually or when available.

Clover straw, 2½ to 3 tons per acre, or alfalfa hay refuse.

Straw, 2½ to 3 tons per acre supplemented by the addition of 100 pounds of a nitrate fertilizer.

Nitrogen fertilizers applied in late winter are for the purpose of increasing the cover crop yields.

23 Per Cent of Income From Fruits and Nuts

Approximately 23.5 per cent of the Benton county agricultural income is from horticultural crops; tree fruits and nuts 14.6, small fruit, nursery, and greenhouses 7.8, and truck crops 1.1 per cent. The annual valuation is $554,360.

Prunes Leading Stone Fruit Crop in Benton County

Prunes. Prune acreage in Benton county according to census figures and estimates is 850 acres with 15 acres non-bearing. This is a decrease from 1500 acres listed by the census in 1930. Prunes and plums for the state of Oregon showed 43,311 acres in 1919 and 54,-

TABLE 4. GROWTH OF THE WORLD DRIED PRUNE PRODUCTION SINCE 1899

	California	Northwest	United States	World
Year	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	.....	.....

852 acres in 1933. The crop is the most extensively produced stone fruit in Benton county.

The situation:

Production of dried prunes in the Pacific coast states reached a total of 283,000 tons in 1935. During the same period production of the Italian prune, which is confined to the northwest, reached a total of approximately 37,090 tons in addition to about 1,200,000 cases of canned Italian prunes.

European trade barriers have closed the outlet for about 50 per cent of the northwest output of dried prunes. The surplus resulting has been further increased this year 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.

The pack of the western canned prune has increased from 459,591 cases in 1927 to more than one million 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.

The dried prune exports from the United States for 1928-32 and 1934 were:

U. S. average 1928-32, 116,797 tons
U. S. exports for 1934, 85,626 tons

The trend of the western canned prune pack is as follows:

	Cases
1927	459,591
1928	715,749
1929	960,392
1930	719,960
1931	759,271
1932	506,880
1933	794,024
1934	846,000
1935	1,200,000*

(*Estimated)

Marginal Orchards Unprofitable

Under existing and probable future market conditions cultivation and care of prune orchards which are not capable of producing an average yield of approximately 2000 pounds of dried prunes per acre of sizes larger than 50 to the pound is questionable and owners of such orchards would do well to consider their removal. Additional acreage of prunes is not recommended.

Where trees are spaced less than 24 feet apart growers are urged to consider removal of as many as one-half of the orchard. One grower in Washington county reports he made alternate removal of one-half of the trees and that after two or three years the total production in this orchard was just as large as it was before removing the trees and that sizes of prunes were increased from 70's to 50's.

Increased care of prunes at harvest time will do much to build quality. Prunes should be picked at the proper stage of maturity and rotten, ill-shaped, or damaged prunes kept out of the dried. A reasonable standard of perfection is imperative in producing a dried prune before there can be any hope for real expansion in the domestic markets.

Oregon dried prunes are placed in approximately 11 classifications, depending on size, and valued and paid for accordingly without much reference to quality and with a wide range in prices.

Quality as well as size should be considered as a basis for prune grades, and there should be classifications such as small, medium, large, and extra large. Prices could be established on this basis. Definite standards of quality should be established and measures taken to insure proper identification of these standards by the ultimate consumer.

The state department of agriculture should hold such hearings as may be necessary to establish fixed prune grades for Oregon dried prunes.

A uniform Oregon brand is desired for all prunes that meet the specified high-quality standards and elimination from the markets of prunes smaller than "70's" is recommended.

Present low prices for Oregon prunes is due largely to the failure of producers to maintain a sales agency which can control and merchandise the bulk of the Oregon prune tonnage in a manner comparable with the merchandising of competing commodities.

Marketing abuses could be curbed through the affiliation of a majority of the independent prune growers into a bargaining organization operating with an optional pool arrangement under Oregon cooperative laws.

Apples. The present apple acreage in Benton county is estimated at 700 acres, a sharp decline over the last few years. The state acreage has reduced from 71,175 acres in 1909 to 24,256 acres in 1933.

Willamette Valley apples are forced to compete with low grade apples trucked in from outside points, lowering the price to the local grower even for the better grades of local apples.

Increased commercial apple acreage in Benton county is not recommended.

Pears. Production of pears increased in Oregon from 15,274 acres in 1909 to 22,923 acres in 1933. The state produced an average of 2910 carloads of pears from 1926 to 1930. Benton county's pear acreage at the present is estimated at 250 acres and most markets for the locally produced pears are roadside trade, canneries, and local stores.

Further pear acreage is not recommended except where the grower is assured of a roadside market or other local markets such as canneries and stores.

Peaches. Peach production decreased 1127 acres in Oregon from 1909 to 1930 but during this period the Willamette Valley acreage increased 617 acres. The reduction in peach acreage occurred in those counties dependent on long distance shipments in Oregon. The increase in the Willamette Valley is credited to roadside market development and better roads. The peach acreage in the Willamette Valley has increased, reports indicate.

Oregon peach growers at roadside markets must compete with peaches shipped in from adjoining states in addition to peaches now grown and coming into production in the Willamette Valley.

Peach trees planted, if made under these handicaps, should be on soils where high production can be secured at the lowest cost possible.

Plums. The production of plums is limited by the demands of a specialized market and growers interested should secure an outlet before making plantings.

Cherries. Cherries constitute 6 to 8 per cent of the state's fruit income. Benton county has 45 acres of cherries according to the 1930 census report and the 1935 estimates double this figure. Because of poor markets, Oregon is showing a continued decrease in sour cherry acreage although of the total cherry acreage in the state 92 per cent is in sweet cherries.

The importation of cherries has declined since the cherry tariff revision of 1930. This revision has changed the imports from 23,263,267 pounds in 1930 to 1,865,956 pounds in 1934.

Growers who plant cherries at the present time likely will face the severest kind of competition in sale of fruit. Additional acreage in the four northwestern states has not come into bearing and there is a possibility that cherry tariffs may be reduced, even though the present tariffs are essential to the welfare of the northwestern cherry industry and should be maintained.

Growers in a position to secure high yields of fruit per acre at low production cost may be able to meet this competition, but the acreage should not be increased.

More attention should be given to production of high quality fruit in order to reduce the high percentage of off-grade cherries. Reasonable but proper attention to cultivation, insect and disease control, and harvesting methods will be necessary.

Small Fruits 7.8 Per Cent Benton County's Farm Income

Small fruits, nurseries and greenhouses return approximately 7.8 per cent of Benton county's agricultural income. Figures are not available on the exact acreage of these crops.

Growers contemplating producing small fruits are urged to investigate market outlets before planting and to avoid growing a crop which must be "dumped" at harvest time regardless of price. They also are urged to avoid signing open-end contracts or agreements with no price stipulation.

Small fruit plantings should be made on deep, well drained, fertile soils.

Strawberry Acreage Sufficient

Increased acreage of strawberries for Benton county is not recommended unless the grower has an outlet for his crop. The Narcissa is recommended as an early berry for fresh fruit markets and the Marshall is the leading berry for cold pack purposes. It also is used locally for fresh fruit and sometimes for canning. The Corvallis strawberry is recommended for canning purposes when it can be grown on moist land or under irrigation. The Corvallis and Redhart are not recommended for cold pack or fresh fruit markets.

A large percentage of the strawberry plants in the Willamette Valley are seriously affected with crinkle disease which reduces yields and quality of fruit.

For their own protection growers should plant only selected or improved stock to avoid loss from disease. A number of Oregon growers are producing strawberry plants certified as practically disease free.

Red Raspberry Market Limited

The Cuthbert red raspberry is the recommended commercial variety. Planting should not be made unless the grower has a market for his fruit.

Strawberry root weevil control treatments are advised for root weevils attacking red raspberries and caution is urged to avoid introduction into this section of raspberry mosaic, a disease causing losses to growers in neighboring states.

Blackcap raspberries. Small increases in acreage may be possible under the present outlook but the grower should have a market located for his crop. Plum Farmer is a recommended variety.

Evergreen Increase Possible

A limited increase in acreage of evergreen blackberries is possible provided irrigation is available. Local processors should be consulted before planting.

Youngberry Demand Increasing

Although there is a growing demand, expansion is limited to local

trade and the ability of local processors to find markets.

40 Acre Fruit Unit Is Minimum Acreage

Forty acres should be the minimum acreage for a fruit farm unit where other sources of income are not available because many growers have wasted capital and failed to secure adequate income from small fruit acreages.

The state of Oregon should establish an inspection service at the state lines to guard against importation of cull fruit, tree fruit diseases, small fruits and nut trees.

Discourage "Home" Orchard

Home orchard planting is generally discouraged. These small home orchards usually are neglected and unsprayed with the result that they constitute a real menace to the commercial fruit industry of the country and the disease control campaign.

Abandoned orchards should be removed as a protection for commercial orchards in the county and state laws regulating the control of economic fruit pests and diseases enforced. There could be a more rigid enforcement of branding and grading laws regulating the sale of fruit.

WALNUTS AND FILBERTS

The acreage of English walnuts in the United States is confined mostly to the Pacific coast, the walnut acreage in California and Oregon being listed in Table 5.

The California walnut acreage increased from 87,010 acres in 1922 to 139,000 acres in 1934 and the Oregon acreage increased from 8,000 acres to 27,000 acres during the same period. There were 21,500 acres of non-bearing trees in California in 1934, and 12,000 acres in Oregon, a total of 233,500 acres non-bearing trees in Oregon and California.

The Benton county walnut acreage is estimated at 700 acres and filberts at 400 acres.

Estimates place the 1935 United States walnut production at 45,000 tons while the commercial European crop is estimated as 75,000 tons.

Cost of Production Varies

The cost of producing walnuts in Oregon in 1929 was 17.4 cents and in 1931 dropped to 9.2 cents per pound. In 1931 the low cost group in Oregon had an average cost of 4.4 cents per pound while the high cost group had charges from 13 cents to 54.1 cents.

In 1929 the low cost group averaged 9.4 cents and the high cost group 78.5 cents per pound.

Tariffs on walnut imports into the United States are listed as follows:

	Unshelled	Shelled
Tariff Act, 1913	2 cents per pound	4 cents per pound
Act, Sept. 22, 1922	4 cents per pound	12 cents per pound
Act. June 18, 1930	5 cents per pound	15 cents per pound

Suggestions made for advertising and production are made as follows:

1. Advertising of Oregon walnuts and filberts as Oregon products is recommended.

2. Protection of the northwest nut industry against importations of nuts is held imperative and tar-

iffs on nuts now in force should not be lowered.

3. New plantings if made at all should be only on the best well drained, deep soil. Orchards already planted should be given the best of cultural care to maintain or bring about high per acre yields at low costs.

4. Walnut growers face heavy competition in marketing not only from within 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 good quality in order to meet this competition. Owners of low-producing walnut orchards having high production costs may well consider abandonment of these acreages.

5. The size of new walnut and filbert plantings should receive serious consideration from those who depend on these crops for their entire income. With low prices prevailing the small walnut tract is not an attractive venture as a sole source of income. Returns from small acreages of walnuts and filberts as indicated from cost account records by the State College in 1929 illustrate the necessity of acreages large enough to return an adequate income. The following figures show various acreages, the pounds of nuts produced, and gross returns:

Acreage	Pounds produced	Gross returns
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

6. Walnuts should be picked up and dried immediately after they fall, delay in picking and drying resulting in poor quality kernels.

7. The production of pecans and almonds has not yet proven successful in the Willamette valley. Chestnuts are only partially successful.

8. The Franquette is the leading commercial variety of walnuts.

Filbert Acreage in Northwest

Estimates place the filbert acreage in Oregon and Washington as follows:

	Oregon	Washington
Bearing trees	4,000	400
Non-bearing	3,500	800
Plantings, 1935	1,000	250
	8,500	1,450

The 1929 census reports 1,000 filbert trees in the East, 600 of these being reported in Illinois nurseries. There are a few on trial in New York.

There are no indications that the filbert acreage is being increased in the East and Southern United States.

In 1932 the cost of producing filberts in Oregon from 436 acres in 36 orchards, producing 17,254 pounds of filberts, was $54.25 per acre or $1.37 per pound. The average number of trees was 104 per acre and the average age nine years. The 1932 season was a light crop period.

The cost of producing on high cost farms was 13.7 cents per pound.

TABLE 5. TOTAL CALIFORNIA AND OREGON WALNUT ACREAGES

	Bearing	Non-bearing	Total
	Acres	Acres	Acres
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

*Note the high per acre production of this orchard.

The cost of producing on low cost farms was 5.3 cents per pound.

Investment in filbert orchards in Oregon and Washington is as follows:

4,400 acres of bearing trees at an investment per acre of $666	$2,930,400.00
Estimated non-bearing 4,300 acres @ $500	2,150,000.00
Estimated newly planted 1,250 acres @ $400	500,000.00
Estimated total filbert investment	$5,580,400.00

Future of Industry Uncertain

Growers who plant filberts at the present time are quite certain to be faced with a period of reduced prices, and a possible reduction of filbert tariffs. With the present outlook, marketing of the crop might easily become a more serious problem. Plantings, if made at all, should be on deep, well drained fertile soils where the highest production at low cost can be secured. New plantings when made under favorable conditions should be arranged on the square plan, not less than 25 feet and possibly 30 feet apart.

Small acreages of filberts as the sole source of income generally should be discouraged.

There are new varieties of filberts that show considerable merit but the Barcelona continues to be the leading commercial variety. Suitable pollenizers must be used with this variety. For these consult the county agent and agricultural experiment station.

Worms in filberts are a possible menace to the industry and investigations are recommended in the hope control measures may be determined.

Growers should become identified with some permanent, well organized marketing organization in order to avoid indiscriminate dumping of filberts on the market at harvest time.

Filberts should be picked up immediately after falling from the trees and dried if the best quality is to be obtained.

POULTRYMEN LOOK TO THE FUTURE

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

Two Units Stabilize Market

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

Producers may purchase feeds and supplies either from the independent feed or 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 the growers.

Oregon produces approximately 700,000 turkeys, of which more than half must be exported to markets outside the state. The annual gross income from turkeys in Oregon exceeds $2,250,000.

Disease factors driving the turkey industry west in search of clean range land for a time gave a distinct advantage to Oregon.

Oregon's turkey industry will face increased competition due to other states adopting artificial methods of mass production.

The trend today is toward large commercial flocks in the hands of fewer operators and a decline in number of range reared birds. The ready sale of dayold poults has stimulated the expansion of commercial hatcheries and the demand for hatching eggs has resulted in many farms maintaining mated flocks for the egg production.

Turkey breeding houses, artificial lights, selecting breeders for early maturity, and northern and eastern hatcheries contracting southern winter hatching eggs for early poults are factors which result in an increasing number of early turkeys being marketed each summer and fall. This occurs before the market price has been established and before the cold storage holdings have been consumed. The industry rapidly is losing its speculative possibilities and is becoming a marginal business of narrower profits per pound of meat.

Favorable Ratio

The turkey crop of 1935 had a most favorable ration between feed cost and turkey meat prices. As a result of this favorable year indications are that the number raised may soon exceed that which the per capita rate of consumption will absorb at fair prices to the grower.

Oregon turkey growers have the advantage of experience, reasonably priced feeds, climate and green feed, foundation breeding flocks, and both independent and cooperative outlets for their product.

During the past few years the turkey industry of Benton county has expanded, producing market turkeys and establishing hatcheries and breeding farms which supply poults, hatching eggs, and breeding stock to many parts of the nation. The average crop is about 30,000 market turkeys, most of which are marketed outside of the county.

Turkey growers planning great 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 in 1936.

Quite Rapid Adjusting

The turkey business is a short term business, many entering and leaving it during periods of high

and low prices.

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

Battle Constantly Against Disease

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

2. Blackhead losses may be averted if turkeys are not reared or ranged with chickens or on ground recently used as chicken range.

3. The cost of production can be reduced materially by providing succulent green feed during the growing period, turkeys being great consumers of roughage in this form. In addition to rape, alfalfa, clover, and sudan grass, corn or sun flowers should be provided for both greet feed and shade on farms where natural shade is not available.

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

5. Ample credit is necessary to finish a band of quality turkeys properly. Beginners too often think in terms of profit rather than costs. Growers should provide finances to the extent of the cost of one sack of feed for each turkey to be marketed. 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 is urged that a general credit policy be established that extends credit only to growers who can finance their own poults to eight weeks of age.

6. There are disease hazards which growers must consider, the most common being fowl-pox, croup, pullorum, mycosis, and coccidiosis. Growers are urged to protect their investments by having an authentic diagnosis made of disease outbreaks as early as possible.

7. The use of semi-scalding equipment by individual farmers except for immediate consumption is not recommended.

JOINT TURKEY AND POULTRY REPORT

1. Poultry stealing is a growing hazard against which producers must protect themselves and a suggested plan to curb thievery is:

a. Make poultry stealing a felony.

b. Require all dealers to display a record of all registered tattoo brands. The present law requires all dealers to keep a record of all branded birds purchased. When enforced this aids in tracing and claiming stolen birds.

c. Publish annually a booklet in which the owners of all registered brands are listed and place a copy of it in the hands of every peace officer in the state.

d. Growers must have a bill of sale before they can sell turkeys having a brand that differs from their own.

Spread of Dog Tax Eyed

2. It is recommended that the present law relating to the disposition of dog tax license money be amended to include indemnity for poultry killed by dogs.

3. The commercial breeder and hatchery code was discontinued when the NRA was declared unconstitutional. All provisions of the code relating to fair trade practices and misleading advertising were taken from a trade agreement made with the federal trade commission before the days of the code. They remain in effect.

4. Anyone damaged by misleading advertising or unfair practices within the poultry industry should file his complaint with the Oregon branch of the International Baby Chick association, who will serve as forwarding agent to the federal trade commission.

MANY FARMS KEEP POULTRY

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

Benton county in 1930 had 1340 farms of which 1103 or 82 per cent kept poultry;

Six hundred eighty-two or 62 per cent had home table flocks of less than 50 hens;

Two hundred twenty-four farms or 20 per cent had flocks above 50 hens but less than 100;

One hundred nine farms or 10 per cent had more than 100 hens but less than 200; and

Eighty eight farms kept flocks in excess of 200 hens.

Flocks of the last two groups are too large for home use and not large enough to justify commercial care needed in producing a quality egg for outside trade. In 1930 the value of chickens raised was $113,073 and of eggs produced $247,110, for a total of $360,183. Both value and volume declined since 1930. In 1935 there were 1687 farms, an increase in five years of 338 farms.

Choice of Markets

Producers of eggs in Benton county have the choice of selling either through established independent dealers or through the Pacific Cooperative Poultry Producers' Association having branch stations to serve this section at Albany, Eugene, and Junction City. The cooperatives of the coast states maintain as one unit their own sales headquarters in eastern cities. The grower's choice of market outlets has been brought almost to his door, but producers here have been slow to furnish what the markets desire.

Growers also have the choice of purchasing their feeds and supplies from independent dealers or cooperatively through the Pacific Cooperative Poultry Producers' Association.

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

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

Egg Industry May Expand in 1936

Oregon produces only 1 per cent of the nation's poultry products. With this volume it has lit-

tle voice in setting prices. Producers here operate on a margin between New York prices minus the overhead of delivering eggs of certain grades to distant markets.

The industry here and throughout the nation will expand in all phases throughout 1936 as a result of favorable prices in 1935. The Pacific coast states in 1936 (as in 1935) likely will show the highest per cent of hatching increase. This increased number of pullets next fall probably will have a depressing price effect, but may be partially offset by an expected increased consumer demand.

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

The poultry business as a planned farm enterprise in Benton county is sound business. A number of the 338 new farms, rehabilitation, resettlement, and subsistence farms will keep poultry. If Oregon's expansion is toward barnyard flocks rather than toward flocks large enough to justify commercial care, it cannot long hope to meet export market requirements. Ninety-two per cent of the farmers who keep chickens in Benton county have less than 200 hens. These flocks are too small to join a cooperative, justify frequent gathering, proper farm storage facilities, frequent deliveries in case lots or other factors necessary for 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.

Recommendations Suggest Changes

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

2. The farm which plans a sideline cash income from poultry with eggs entering trade channels, a flock of not less than 400 to 500 hens as the ultimate objective is suggested.

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

4. For a well rounded specialized poultry farm program operated under natural conditions of ranging young stock an acreage of 20 acres is recommended. Where artificial confinement throughout is practiced less acreage is needed. (Raising under artifical confinement is successful for the few but is not given general endorsement for all.)

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 so the chicks are from pullorum free parent stock or accurately blood tested parent stock with all reactors removed.

7. Under average conditions and equipment all chicks should be purchased early and at one time. February, March, and April are the three months in which the big majority of Willamette valley 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.

a. The permanent brooder house, equipped with artificial yards such as wire, concrete, or board floor.

(See county agent for Extension Bulletin 451.)

b. The portable brooder house equipped with skids for moving to clean soil. (Extension Bulletin 446.) Because of less labor overhead the permanent brooder house is in general use throughout commercial regions.

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 production. The ration then may be reduced to avoid too dark yolk color. Kale and alfalfa are the main green feed crops with carrots supplying winter succulence in case of a freeze.

11. The greatest economic loss to the poultry grower is in the quality of eggs on the farm after they are laid and before they reach the grader's candle. "How to Construct an Insulated Egg Room" is told in Extension Bulletin 445.

12. Extremes of temperature show that laying fowls do better in partially insulated houses. Plans for this type of house as well as others 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 where the laying house is used for brooding, it will require a first year investment of approximately $2.50 to $3 per pullet before she starts production. This expenditure when pro-rated will include cost of brooder, fuel, feed, litter, cost of chicks, mortality losses, laying house, and equipment. A well defined plan should be followed because there are as many hazards in poultry keeping as in other lines of work.

PASTURES NEEDED FOR LIVESTOCK

Benton county farmers should attempt in so far as possible to market all their feed produced through some breed of livestock. The classes of livestock aside from dairying that have a place on Benton county farms include sheep,goats, hogs, horses, and beef cattle.

The pastures, particularly in the hills of the county, have grown up to brush and much of the grass has been replaced by moss, thereby reducing the carrying capacity for certain types of livestock.

Improvement of Lambs Suggested

It is believed that sheep should be kept on most farms where there is feed suitable for them. At the present time in view of the pasture conditions there should be no increase in the total numbers of sheep unless there is an improvement in native pasture and an increase in acreage of permanent pasturage on the farms throughout the county.

An improvement is advised in quality of lambs marketed, through the use of more carefully selected breeding stock and better feeding and management. The suggestion is made that farmers who are raising sheep plan the time of lambing so that it will be possible to provide a continuous supply of feed suitable for the ewes during the time they are carrying the lambs, after the lambs are dropped, and up to the time the lambs are marketed.

The study of the market conditions at Portland shows that only 50 per cent of the western Oregon

lambs carry sufficient condition to bring top price on the market. The remaining 50 per cent sell at an average of nearly $2 per hundred pounds less than top price. This condition is due to an insufficient feed supply to produce milk for the lamb after it is dropped. Farmers are advised to study the possibility of supplying such pastures as fall sown grain or other suitable pasture crops that will furnish continuous seasonal grazing. Good care and management also will increase the profits from sheep raising. This would include the treatment and management practices necessary to reduce disease loss to the minimum.

The market demand at the present time is for a well finished lamb weighing from 80 to 90 pounds on the farm.

Goats Good to Reduce Brush

In view of the increase in the growth of brush on many Benton county pasture lands, it is believed that farmers are justified at this time in considering goats as a means of clearing the land as well as making a profit. The present outlook for goats is more encouraging than it has been for some time. This is due to a national and international shortage in mohair. The demand for mohair at this time is increasing through manufacturing channels.

Farmers are advised that where goats are kept careful attention be given to the quality of the breeding stock. The use of heavy-shearing billies and careful attention to the clip mohair also is important.

Saturation Point Reached on Beef

It is believed that there is no justification for increasing the number of beef cattle under Benton county conditions. While there means of clearing the land as well are a number of farms in the county that can carry a few head of beef cattle, it is felt that their production should be maintained on about the present level.

Raise More Horses

There is an increasing shortage in horses throughout the United

Figure 3. Benton county 4-H corn club members and their corn.

States as well as in Oregon and Benton county. At present time it is estimated that the average age of draft horses on farms is very high, resulting in a high annual death loss. Benton county farmers should raise colts from their best brood mares, at least, to the extent of supplying their own needs for horse labor on the farm.

New Low Hit for Hogs

The number of hogs in the United States at the present time due to the drouth and the reduction program is the lowest that it has been in 50 years. It is predicted that there will be a rather rapid increase in the number of hogs during the next few years throughout the nation. So far as Oregon is concerned this state has been on the import basis for a number of years. Oregon needs nearly one-half million hogs to take care of its own needs. At the present time the number is comparatively low in the state and it is believed sound business for Benton county farmers to increase the hog production on their farms. At least enough hogs should be kept to utilize the farm wastes and by-products for which there is no other outlet. Hogs can be raised profitably on that basis as well as on pasture, using home grown grains as a supplement. Use of good breeding stock to lower the cost of production and careful attention given to the sanitary precautions necessary to keep hogs healthy and thriving, have been found profitable.

MANY FACTORS GOVERN CARE OF SOIL

The soil is Benton county's most valuable resource. All phases of agriculture are directly dependent on the soil and agriculture can last no longer than the soil upon which it is founded. The conservation of the soil and its fertility is of far greater importance than merely the welfare of the individual farmer. The farmer who manages his farm in such a manner that the soil is destroyed to a point where it may never be rebuilt has helped to destroy a portion of a natural resource.

Loss in production is a distinct loss to the county, state, and nation. After a farm is lost to production, additional burdens are placed on other farms and industries assuming the tax load once carried by that farm.

Since 1900 the area of improved land in farms in Benton county has been reduced from 100 acres to 57 acres. This emphasizes the need of following management practices permitting full utilization of the soil resources in order to maintain large enough per-acre yields to permit farm families to maintain a satisfactory standard of living from the smaller acreage.

The soil utilization and conservation problem is treated under the general classifications of soil fertility, drainage, erosion, and irrigation.

Individual Soils Require Individual Attention

Crops should be grown only on soils adapted to their growth. A soil survey report of Benton county is available and every farmer should consult it to determine what crops will do best in his soil. This particularly is important when planning on growing long-time crops such as orchards. Orchards never should be set without first carefully checking the soil as to drainage, depth, and soil fertility. Newcomers are urged to consult this soil survey report in order to pick out a farm having a soil type adapted to the type of farming which they are particularly anxious to follow.

Conserve Soil Fertility

If farming is to continue on a permanent basis, it is absolutely necessary that every precaution be taken to conserve the fertility in the soil. The best possilbe way of conserving the soil is to follow farming practices that keep up the organic matter supply in the soil. On the general farm, the best means of keeping up the organic matter supply is to follow a crop rotation including some legume crop. This legume crop not only builds up the supply of organic matter but also adds a valuable supply of nitrogen to the soil. Other means of supplying fertility are:

Lime. On many of the soils in Benton county, it may be necessary to add lime in order to grow legumes. Whether lime is necessary or not may be determined by a simple soil test. This testing service is available free-of-charge in the office of the county agricultural agent.

Cover crops. With orchards or with other permanently cultivated crops, the best method of maintaining the organic matter supply in the soil is to follow the practice of growing cover crops every winter. The variety of crop to grow will be determined largely by the farmer's soil type. A legume should be included with the crop sown, although if the soil is not adapted to the growth of legume crops

some other crop may be more desirable.

Crop residues. The proper conservation of soil fertility requires that all crop residue be returned to the soil. In this connection, the practice of burning straw stacks, combine rows, and stubble is a wasteful practice. Not only is plant food wasted but also a valuable source of organic matter is lost. In this connection further study is needed on methods of spreading straw and adaptable tillage implements that will plow straw under without too much additional labor. Further investigation is also needed on the possibility of adding nitrogenous fertilizer to straw in order to hasten its decomposition and make better use of the organic matter in the straw. Present knowledge indicates that the addition of 20 pounds of nitrogen (100 pounds of 20 per cent nitrogen fertilizer) will greatly increase the value of straw added to the soil. On farms with livestock, a loafing shed is recommended as a means of making the best possible use of this straw.

Barnyard manure. To prevent the loss of valuable plant food, it is desirable that all barnyard manure be conserved in such a manner as to prevent the waste of plant foods. The manure also should be returned to the soil in such a manner that the best possible use will be made of the plant food it contains. As suggested above, the loafing shed is one of the most economical methods of conserving a good portion of the plant food in manure. Manure there is not subjugated to leaching by winter rains and the continual tramping by the livestock prevents loss from heating.

On dairy farms the liquid tank method of handling manure should be more widely adopted. This method of handling manure prevents any possible waste of plant food, and also permits the handling of manure with a minimum of labor, and the necessary equipment is not expensive. When used in combination with a loafing shed, the result will be the saving of all available manure produced on the farm. Further information in liquid tanks is available through the county agent's office.

Best use may be made of manure by applying it to the soil at a time when growing crops will utilize the available plant food. This means that ordinarily the proper time is early in the spring previous to seeding. On most farms greater benefit could be secured from manure by spreading it on the land in comparatively small amounts, if possible not over eight to ten tons per acre. A greater increase in yield per ton of manure applied will be secured in this manner than where heavier applications are used.

Because use of lime causes a loss of a good portion of the nitrogen supply of manure, it is recommended that superphosphate rather than lime be used as a deodorant and disinfectant around the dairy barn. Superphosphate assists in holding the nitrogen in the manure and prevents it from being fermented way. Manure also is very low in phosphorus as compared to other plant foods, and the addition of this phosphorus would result in securing better results from the use of manure.

The state department of agriculture should be asked to approve the use of superphosphate in dairy barns instead of lime.

Permanent pastures. Where there is any amount of livestock on a farm the use of a permanent pas-

ture in a regular rotation is recommended as being an economical method of rebuilding the organic matter supply of the soil. A rotation should be worked out so that every field in the farm would be a permanent pasture once every 10 to 20 years.

Commercial fertilizers. If the productivity of a soil is to be maintained a time eventually will come when more general use of commercial fertilizers will be necessary. Results secured in Benton county so far have not been consistant enough for any general recommendations except that the application of landplaster to legume crops generally is considered a profitable practice throughout the county. In the future it may be desirable to further try the use of superphosphate on these legumes instead of landplaster since the Benton county soils generally have a lower supply of phosphorus than other plant foods. It is logical to expect an increased yield from the use of phosphorus before the use of other plant foods is necessary. The use of phosphate fertilizers should be based on the results of a test for available phosphorous which may be made in the county agent's office. Fertilizer trials with possible expansion are recommended to determine which fertilizer may be needed first.

On the individual farm no practical program of commercial fertilizer use can be worked out without a certain amount of experimenting by that farm. Before making any large purchases of commercial fertilizer individual farmers first should try them out in a small way before spending any great amount of money. Purchases of commercial fertilizers should be based on the amount of plant food contained in the fertilizer.

Soil Erosion Active

Soil erosion in Benton county is a greater problem from the farmer's standpoint than most people realize. Losses by erosion that occur in this area are so gradual that they generally are not noticed.

Nevertheless there are many farms in Benton county where the loss of soil from erosion has been so serious that these farms can no longer be farmed profitably. It is extremely important that losses from erosion be prevented as much as possible since soils once washed away can never be replaced. Under average conditions ordinary good farming practices which maintain a good organic matter supply in the soil and provide a good cover for the soil during the winter months will largely prevent erosion losses. On any sloping soil, farming practices should be followed that will not leave the soil unprotected during the winter months. If possible some system of farming should be worked out that will make it unnecessary to plow land in the fall or winter leaving it exposed to washing previous to spring seeding.

From the standpoint of long time return and prevention of losses by erosion, many of the steeper hill soils could better be seeded to permanent pasture rather than farmed continuously.

The loss of soil by erosion is particularly serious in orchards. To prevent this loss it is absolutely necessary that the soil be protected with a cover crop during the rainy winter months.

Drainage Important Factor

According to the soil survey report, there are 51,800 acres in Benton county that need drainage. The full utilization of the soil resources will require that this land be drained.

The actual method of tiling will depend greatly on conditions encountered on the individual farm. Anyone installing tile should secure the services of some experienced person in determining the depth to place the tile, the distance between the laterals, and the different sizes of tile to use. The proper depth and distance will vary greatly with the type of soil. It is well to have a drainage plan for the entire farm worked out before laying any tiling. This will permit the installation of the small amount of tile at a time, knowing that this tiling will become part of the future system and that it will not be necessary to dig up and relay the tile at a future date.

It is not economical to use any tile smaller than four inches in diameter and unless exceptional conditions are encountered the tile should be placed at a depth of at least 24 inches.

There are conditions where it is impossible to install tile drainage through lack of finances on the part of the individual farmer, an outlet that will not permit the tile to be placed at an adequate depth, or a soil type in which drain tile will not work. Where such conditions are encountered, open ditches should be used to carry off the surface water.

In some sections of the county community organizations will be necessary to provide adequate drainage outlets for individual farms. These organizations should be completed in order to construct and maintain these outlet ditches.

Irrigation Is Gaining

Because of the lack of summer rainfall in Benton county irrigation is a sound practice considering the economy feature. Weather records at Corvallis for the past 45 years indicate that there never has been an adequate supply of moisture to maintain crops expected to grow throughout the summer months. Contrary to popular belief these records do not indicate that the summers are drier at the present time than they were 20 or 30 years ago, indicating that one may start irrigation with the idea that it will be a permanent enterprise.

Application of irrigation water should be of benefit to any crops expected to grow through the summer months but the actual expense one can afford for irrigation can be told only after a careful consideration of the cost of irrigation as compared to the increased returns from irrigation. Experience has shown that under proper management yields of many crops may be doubled with water.

According to the soil survey report of Benton county there is an area of 110,710 acres to be irrigated, 53,504 acres of which are soils of the Willamette, Chehalis, Newberg, and similar free-working soil series upon which horticultural crops, vegetables, potatoes, alfalfa, and clover may be grown under irrigation. The remaining area of 46,858 acres of Amity, Dayton, Wapato, and similar heavier soils are adapted to pastures and field crops under irrigation.

Supply Could Be Increased

At the present time water is available for only a small percentage of this area, being limited to the natural flow in the streams and in a very limited area to that by pumping from wells. Irrigation of a much larger area of land than permitted by present water supply is a sound development and the program of the United States Army engineers in studying storage sights to provide a more adequate supply of water during the summer

months is commended. These storage sites also would reduce annual loss from floods. Findings of the engineers on ground water should be made available to the public as soon as possible to assist persons contemplating irrigation from wells.

Because of the fact that any large number of new settlers brought into Benton county would mean further subdivisions of already established farms, the committee feels that a development of irrigation is especially important since it will permit and adequate income to provide a satisfactory standard of living from a much smaller acreage than where the land is not irrigated.

Crops grown successfully under irrigation have included Ladino clover pasture, red clover for hay and seed, alfalfa, potatoes, berries, and a wide variety of vegetable crops.

Clover Crop Good

For general farming, irrigated Ladino clover is recommended as being a very profitable crop wherever livestock is produced. Experiences in this county have shown that this irrigated pasture will have a capacity of two to four cows per acre for six months out of the year and other stock can be carried in this proportion. This means that this number of cows will receive most all of the feed from this pasture during this period of time. Probably no other feed crop can be grown that will produce a greater return per acre.

A south Benton county dairyman has carried 30 head of cows on 12 acres for six to seven months out of the year. This has enabled him to produce butterfat with the lowest feed cost of any other member of the Linn-Benton Dairy Herd Improvement association. The cost during the period while the cows were on pasture was 13 cents per pound.

Study Irrigation Systems

Because irrigation problems will vary greatly on individual farms it is recommended that each farmer planning installation of an irrigation project have the plant designed carefully to fit the individual conditions. Such assistance is available through the county agent's office. Because of the increased interest in irrigation the extension service at Oregon State Agricultural College should make available more technical assistance on irrigation so individuals may avoid costly mistakes.

Any person starting an irrigation project must file an application for a water right with the state engineer's office at Salem. Work necessary to secure this right should be completed as soon as possible. This water right is for the individual's own protection. If he does not file, the water could be taken away and money invested in the irrigation system would be a loss.

Some type of surface irrigation generally is recommended, although there are many places where rough land, soil type, water supply, or nature of the crop might mean some form of sprinkler system would be more desirable. Where flood irrigation is contemplated, the importance of properly levelling the land before seeding cannot be too strongly emphasized. Where it can be used, the strip-border method of irrigation is recommended. Experience has shown that the expense of properly levelling the land is repaid by the saving in water and labor of application.

Preparation Important

If Ladino clover is to be sown, the land should be prepared for ir-

rigation in the fall or early in the spring. While successful plantings have been secured by seeding at many different times of the year, probably most of the successful seedings have been made early in April. Seedings are made at the rate of three to five pounds of seed per acre on a well-prepared, firm seed bed. Better returns may be secured from this clover if it can be handled so stock may be kept off of the land immediately after irrigation. Best results have been secured by dividing the pasture into at least three fields and rotating the stock.

Where it is necessary to irrigate by pumping, the pumping plant should be carefully picked out to fit the individual requirements. In most cases ,the centrifugal type of pump seems to be the most economical. Every centrifugal pump is constructed to fill a certain requirement and if placed under conditions other than those for which it was designed it will not be an efficient piece of machinery. For this reason the pump should be purchased on the basis of the water required, the total pumping head against which the pump most operate, the water available, and the type of power available. The beginner in irrigation is urged to determine these conditions, turn the information over to a reliable pump dealer and let the dealer select the pump best suited to the job. Pumps offered by dealers may be compared on the basis of the amount of water delivered with a given horse power. Pump purchasers are entitled to a guarantee of performance from the dealer. After every pump is installed it should be checked to determine whether it lives up to its guarantee. Because of the variation in construction of centrifugal pumps and outward appearances they may all look the same yet have entirely different performance. Second-hand pumps should be avoided, unless one has absolute assurance that the pump is fitted to his individual requirements.

Time Water Applications Properly

To achieve the best results from irrigation, crops should be irrigated as soon as they show signs of needing water. Past experience has shown that many people do not get full value out of irrigation because of the fact that too long a time elapses between irrigations, allowing the crops to stop their growth from lack of moisture. Another mistake often made is that the first irrigation is delayed too long. It is good insurance to have the irrigation equipment ready for use by May 1 to 15, since in many years it is necessary to start irrigation by May 15.

Further work should be done by the Oregon State Agricultural College experiment station as to the actual amount of water to apply on different soil types and for different crops. Experimental work also is needed concerning the best methods of applying water in order to achieve the most economical use. Further investigation might be done to find additional crops and best varieties of crops to be grown under irrigation.