# Oregon's Agricultural PROGRESS

More Farms for Fort Rock?

More Hogs With Cheap Barley

Where New Zealand White Clover Grows Best

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Oregon's Agricultural
# PROGRESS

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**COVER STORY: Homesteaders may try again to farm the bleak Fort Rock countryside, now that an underground lake can supply irrigation water. Their chances for success are reported on page 12.**

SOIL BANK or no soil bank, 1956 is likely to be another rough year for most Oregon farmers.

Even so, there seems to be much good in the widely discussed "soil bank" idea. It would take out of production 10 to 20 per cent of the nation's cropland and save it until needed in an emergency such as a drought or all-out war, or by our future population. Farmers would receive payments for maintaining this reserve, but these moves wouldn't have much effect on prices and incomes in 1956.

Even if approved by Congress early in the year, it would take time to realize the bank's main income-boosting benefits. If the acreage taken out of crops brought sufficient production cuts, farmers' incomes would improve after awhile. Farm prices probably would be enough better in two or three years to more than offset the decrease in amounts sold.

Meanwhile, large stocks of farm products piled up in recent years would hold prices down. Substantial government payments would be necessary to keep many farmers going while the "bank" is being established.

**Farm income**

Your net from farming in 1956 may be a little more than half of what it was in 1951. It is not likely to be much more unless you are doing better than the average Oregon farm operator.

In other words, if you netted $10,000 in 1951 after paying your operating expenses, you will be doing well to net more than $5,000 in 1956. That's the amount you would have left to put toward living expenses, debt payments, and savings. Of course, most of this cut has already come for the average operator. Some have taken even more.

Actually, the average Oregon farmer's net money income from farming in 1951 was less than $3,000, according to USDA figures. This had dropped below $2,000 by 1954. A further drop came in 1955 with little chance for more than a slow-up in this downtrend in 1956. The average net would be down even more if the number of farm operators in the state had not decreased. The census shows only 54,442 farms in the state in 1954, compared to 59,827 in 1950, and 63,125 in 1945.

The census count includes many small farms. Many families on these places are supplementing their farm

1956 farm income to continue downward. . . Cattle prices may touch low point in current cycle. . . National spring pig crop leveling off.

# Farm Outlook

**By Agricultural Economist M. D. Thomas**

income with off-farm work. In 1954, more than 23,000 of the state's farm operators worked more than 100 days off their own farm. An unknown number of farm women and young people also helped bring in much needed cash.

Oregon farm families may do even more off-farm work in 1956, if jobs prove as plentiful and as rewarding as seems likely. Our mill and factory wage rates have risen steadily for several years. They now average a third higher than in 1949, while farm prices are around 7 per cent lower.

For the country as a whole, the USDA estimates farm people now get about a third of their income from nonfarm sources. This includes income from investments as well as savings.

**Washington report**

In discussing the agricultural outlook at the 33rd annual outlook conference held in Washington, D. C. recently, Fred Waugh, director of the USDA division of agricultural economics, had this to say in part "... we expect the cost-price squeeze to continue in 1956. We expect some further drop in net farm incomes. . . . This leaves out of account any changes in farm programs that may be made in the coming session of Congress. Such changes could affect the long-term outlook very substantially. But I doubt if they would affect the 1956 outlook very decisively."

Waugh continued, saying, "No adjustments in farm programs are likely to make an immediate change in the basic economic facts confronting the farmer. It took several years for American agriculture to get into its present troubles. Economists and statesmen can help to get it out but it will take time to do it."

Then he turned to several charts showing, among other things, the well known facts that. . . .

¶ Farmers have not shared in the general prosperity of recent years.

¶ The purchasing power of farm products is the lowest since 1940.

¶ Gross farm income is down 11 per cent and net is down 28 per cent nationally from 1951 to 1955.

¶ Income per farm is down less than total income since farmers are receiving more from off-farm sources.

¶ Prices paid for farm-produced items have declined since 1951 but most other purchased items now are higher.

¶ Consumer spending for food has risen steadily since the beginning of the war.

¶ Marketing costs have risen even faster.

¶ Farm exports have increased moderately in the past 2 years after a sharp drop earlier.

¶ Carryovers of major farm commodities are very great.

¶ Farm output is continuing to rise.

Most of these trends and conditions are likely to continue into 1956, but there is more and more doubt that general prosperity can long continue with farm income on the decline.

**Livestock**

Production of meat animals in 1956 is likely to stay near the record volume of '55. Strong consumer demand for meat and large supplies and lower feed prices point in that direction.

Cattle prices in 1956 may touch the low point of the current cycle and be-

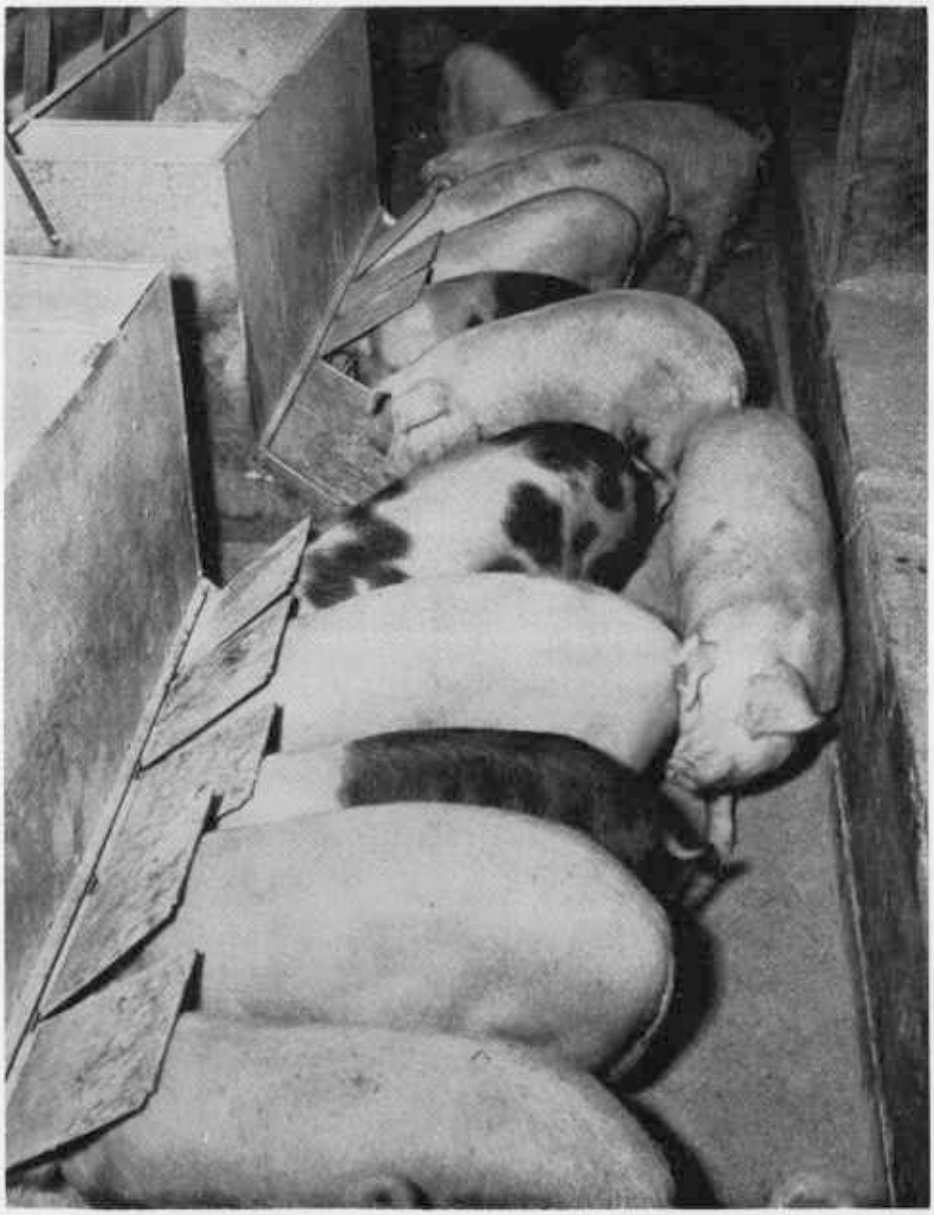
*(Continued on page 16)*

**IT WILL TAKE several years before the new "soil bank" will boost farm incomes. Government payments will be needed to keep many farmers going while bank is being established. Farmer-income in Oregon would be down even further if sales were not supplemented with off-farm work.**

# More Hogs With Cheap Barley

Low hog prices are likely to continue through this spring, but this is not the time to quit the hog business. Cheap barley and higher hog prices here favor Oregon hog raisers over Midwest feeders. We ship in two-thirds of our pork.

**SELF-FEEDERS reduce labor costs for feeding hogs, the second highest cost item for Oregon raisers.**



A MARKET HOG grown and sold in Oregon these days can return more than one raised and sold in the heart of the Corn Belt.

There are several reasons for this, according to agricultural economist Grant Blanch.

¶ Local feed barley can be converted to pork cheaper than corn in the Midwest.

¶ Oregon needs more pork. Two-thirds of our pork supply is shipped in from the Midwest.

¶ Oregon hog growers, on the average, are just as efficient as their Midwest cousins.

These and other facts about Oregon's hog industry, as well as helpful guides for removing some risk from hog raising, were developed after a 1951 cost study of 43 sow-market hog operations in the Willamette Valley, northeastern Oregon, and the irrigated region of central Oregon.

**Oregon producers efficient**

For the 43 hog producers, it took an average of 438 pounds of barley, 18 pounds protein supplement, 3 pounds minerals and salt, 22 hog days of pasture, and 2.7 hours of labor to put on 100 pounds of hog and maintain the breeding herd. Money invested in each sow came to $369. Farms averaged 7 sows, and each sow averaged nearly 2 litters a year. Each sow weaned 7 pigs per litter. These figures compare favorably with average Midwest hog operations.

Feed accounted for more than 75 per cent of the total costs for producing market hogs. Labor was second

**LARGE LITTERS are the start of profitable pork production. Oregon hog producers are just as efficient as Midwest hog raisers, with each sow weaning 7 pigs per litter. Facts about Oregon's hog industry were developed from a 1951 cost study of 43 sow-market hog operations throughout the state.**

with 14 per cent, and capital and other costs, 5 per cent.

Armed with these figures, Blanch has computed "break-even" prices between barley and hogs. For example, barley would be "worth" $48 if marketed through $17 hogs. Put another way, hogs must be worth $14.15 before it pays to feed $35 barley. If hogs won't sell for $14.15 it would pay to sell barley at $35 rather than feed it. The chart shows more break-even barley-hog prices. Labor and other costs based on 1951 figures are included.

### Figure current break-even price

The chart will work, provided labor and other nonfeed costs remain at 1951 levels—$6.50. Right now, that's about the case. And if they change, Blanch says you can easily compute an up-to-date, break-even price. Here's how:

1. Multiply the price *per pound* of grain by 438, the average amount of grain it took to put on 100 pounds of hog.

2. Divide the current index of prices paid by farmers, interest, taxes, and wage rates* by 281 (the 1951 index), then multiply by $6.50 (1951 costs other than grain).

3. Add the two figures together.

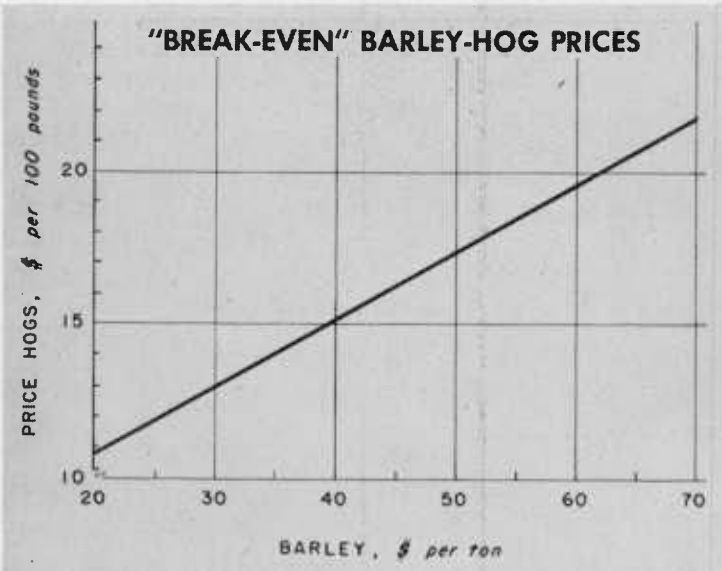
Here's an example:

Let's say that barley sells for $30 a ton, and the parity index is 270. All you do is multiply 438 by 1½ cents per pound ($30/2000), giving you 6.57. Divide 270/281. This gives you .96. Now multiply that by $6.50. Add the figures, 6.57 and 6.24 ($6.50 × .96) for your break-even price of $12.81.

Using this method of computing break-even prices over the past 15 years shows that average Oregon hog producers have lost money only three times—in '40, '44, and '52. After each loss, hog numbers in the state dropped sharply, indicating Blanch's method of computing break-even prices is reasonably realistic with history. Also, years of greatest profit were followed by sharp increases in hog numbers.

The economist emphasizes you must duplicate the average efficiency of the

* Called the parity index, it is reported monthly in a free publication entitled *Agricultural Prices*, by the Agricultural Marketing Service, U. S. Department of Agriculture.



**PASTURES are important for producing pork in some areas of the state. For the 43 producers, it took an average of 22 hog-days of pasture, 438 pounds barley, 18 pounds protein supplement, 3 pounds minerals and salt, and 2.7 hours labor to put on 100 pounds of hog and to maintain the breeding herd.**

43 hog producers before the method can accurately predict your break-even price. If your operation is more efficient than the average, you'll break even at a lower price for hogs; if less efficient, a higher hog price is necessary.

### Reasons for low hog numbers

In 1954, hog numbers in Oregon were the lowest since 1887—101,000. We now have a 2-year surplus of feed grains, primarily barley. The demand for pork in Oregon has always been here. Why then, are hog numbers so low?

The economist cites 4 *historical* reasons.

1. Lack of cheap feed grains. In only 5 out of the past 32 years have Oregon feed grains been priced lower than corn in the Midwest. An Oregon barley grower has averaged nearly 22 cents a hundred pounds more for his grain than a Nebraska farmer has received for his corn. Farmers feeding hogs in Oregon must face this disadvantage, plus the difference in feeding value between barley and corn (for hogs, barley has roughly 95 per cent the value of corn). Government supports have priced wheat out of the feed market, keeping corn in the Corn Belt the lowest cost feed in the country.

2. Hog-feed price ratios have favored Nebraska hog producers 22 out of 32 years from 1923 to 1954. One hundred pounds of hog has bought an average of 32 more pounds of corn in Nebraska than barley in Oregon. Economically, it has been cheaper to ship hogs—live or processed—than to ship in grain to feed hogs locally. Freight rates also favor shipping hogs. Current rates from Omaha are $2 per hundredweight for live hogs, compared to $1 per 100 pounds of grain. If it takes between 400 and 450 pounds of corn to produce 100 pounds of hog you can see it's cheaper to ship hogs than corn.

3. Farm wage rates in the Pacific Coast states have been highest in the nation. Although Oregon hog growers hire little extra labor, their own labor must return the prevailing farm wage in the community growing other farm products. Before 1948, 100 pounds of hog in Nebraska would buy a half day's more labor in Nebraska than in Oregon.

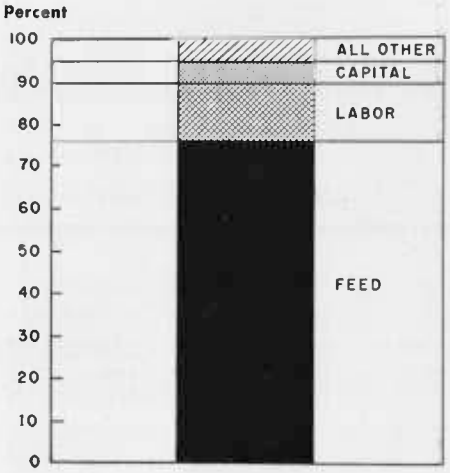
But since 1948, the advantage has shifted to Oregon's favor by one-fifth of a day, because of narrowing wage rates and a widening of the hog price spread between the two states.

4. Competition from other types of farming. Compared to the corn-hog economy of the Midwest, farmers here can profitably grow hundreds of other products besides hogs. No detailed comparison between the Oregon hog enterprise and others has been made, but the continued low numbers in years when hogs would show a profit indicate other types of farming were better competitors.

Blanch points out that farmers look at their total farm income rather than income from a specific product. It isn't enough for hogs to profit. Other types of farming may profit more, and this probably has kept hog numbers down.

Some of the historical reasons for low hog numbers no longer fit the present and perhaps the future picture. Reasonably priced feed barley (or perhaps cheap wheat for feed) favors an expansion in hog numbers. Returns will improve as Midwest hog raisers become discouraged over low prices.

## HOG COSTS



For a high energy broiler ration, an OSC poultryman reports results of. . .

# Replacing Corn With Barley

CHEAP feed barley can partially replace corn.

BARLEY can replace half the corn in a broiler ration without reducing growth or harming feed efficiency, provided a supplement such as 4 per cent stabilized prime tallow (animal fat) is added.

Barley replacing one-fourth the corn without added tallow will give the same results as all corn.

These were the results of a recent broiler-feeding trial for poultryman G. H. Arscott. He was trying to find if cheap feed-barley could replace higher priced corn in high energy broiler rations. In December, 1955, feed barley in the Willamette Valley sold for $46 a ton, corn $63 a ton.

### Fed 256 chicks 10 weeks

Arscott fed 256 day-old, sexed, New Hampshire chicks 10 weeks in batteries. Half received no animal fat, were divided into 4 equal lots. One lot received all corn; a second 75 per cent corn, 25 per cent barley; a third half corn, half barley; and a fourth all barley. A second group receiving 4 per cent animal fat was divided into the same groupings. The rest of the ration was the same, including all the protein, vitamins, minerals, and antibiotics in present commercial rations.

Here are Arscott's results:

**Body Weight**

| Corn | Barley | Animal Fat | |
|---|---|---|---|
| % | % | 0 | 4% |
| | | *Lbs.* | *Lbs.* |
| 100 | 0 | **2.75** | **2.73** |
| 75 | 25 | **2.61** | **2.72** |
| 50 | 50 | **2.74** | **2.85** |
| 0 | 100 | 2.55 | **2.75** |

**Feed Conversion**

| Corn | Barley | Animal Fat | |
|---|---|---|---|
| % | % | 0 | 4% |
| 100 | 0 | **2.33** | **2.18** |
| 75 | 25 | **2.37** | **2.28** |
| 50 | 50 | 2.50 | **2.33** |
| 0 | 100 | 2.97 | 2.63 |

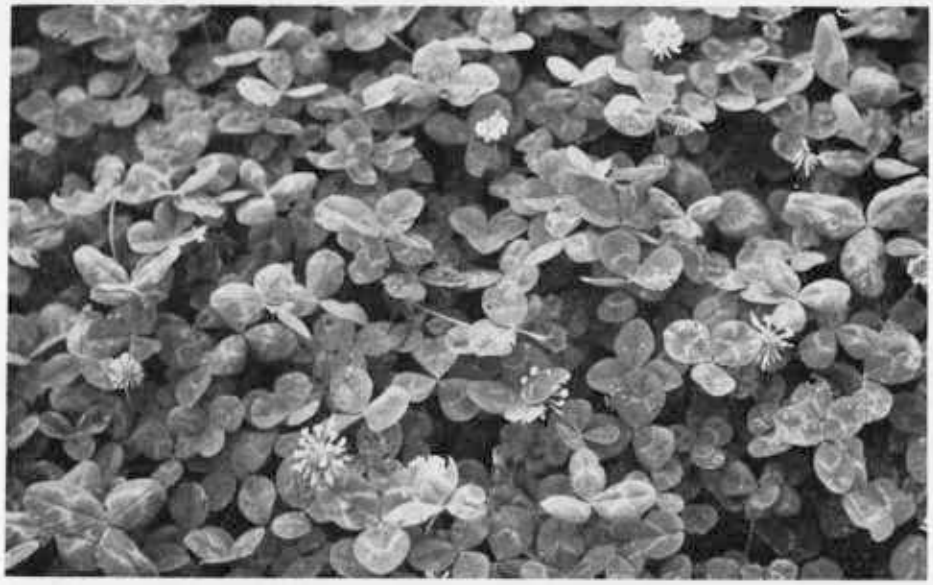
Arscott says the figures in boldface are close enough so they should be considered essentially the same. Those in lightface are different. This is important for comparing rations.

Other interesting sidelights turned up in the experiment, according to the poultryman. One, adding .05% methionine to the corn-barley ration failed to increase growth or improve feed efficiency. Corn contains more methionine than barley. Second, grit failed to up growth or help efficiency in any ration.

BARLEY & CORN-FED chicks gained just as fast as chicks fed all corn in poultryman Arscott's feeding trial. Barley replacing 25 and 50 per cent corn was successful if tallow added to half-barley ration.

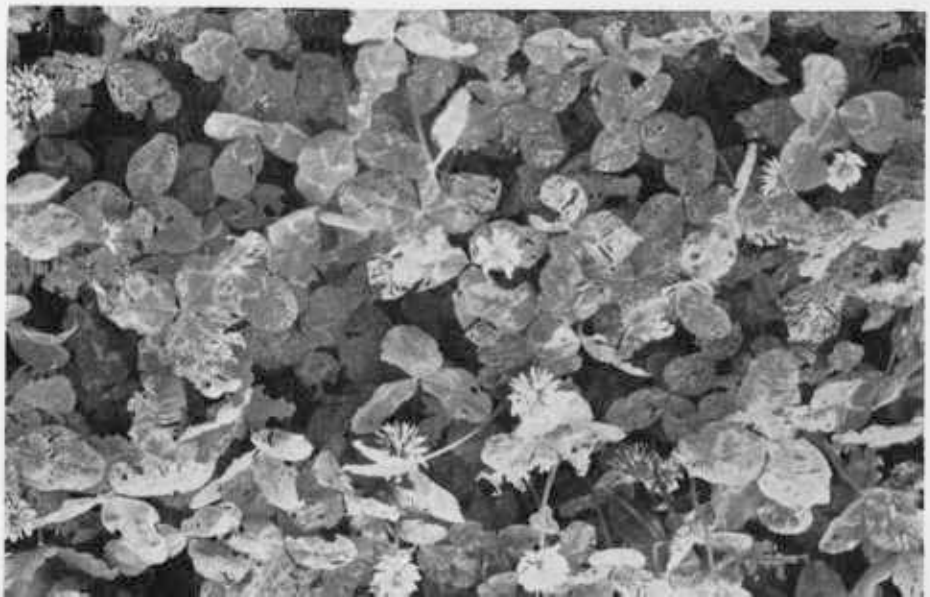
Can't handle those slugs riddling your pasture? OSC agronomists suggest New Zealand white clover. . .

# A Legume That Slugs Leave Alone



**SLUG RESISTANCE of New Zealand white clover shown above. It was growing near slug-infested Ladino plots. Agronomists aren't sure what repels slugs. Hydrocyanic acid in clover may be reason.**

**RIDDLED Ladino clover shows what slugs can do. New Zealand has yielded 40 per cent higher than Ladino in slug-problem areas, primarily along the coast and in some parts of the Willamette Valley.**



ANOTHER CLOVER is promising to replace Ladino where slugs have carved huge slices from once promising pastures along Oregon's coast.

Yield trials for the past three years at the J. J. Astor branch experiment station give New Zealand white clover the nod over other legumes tested—Ladino, Kentish, and Kentucky white clovers and Columbia and Beaver big trefoil.

That and grower-experience indicate it's superior to Ladino along the coast and lower Columbia River counties, and some non-irrigated pastures on good soils in the Willamette Valley.

At Corvallis, yields under irrigation don't measure up with Ladino, but New Zealand white may have a place in irrigated pastures where farmers can't cope with a slug problem.

New Zealand's good showing at Astoria rounds out a 3-year search for a Ladino replacement, by H. B. Howell, station superintendent.

### Slugs a problem

Close to the ocean with mild temperatures, high rainfall, pastures are green the year 'round at the station. But this climate favors garden slugs. Slugs have limited Ladino in pasture mixtures to 2 years.

New Zealand, with a similar climate, faces a problem similar to coastal farmers. New Zealand seed certifiers have maintained low levels of hydrocyanic acid in their white clover.

Hydrocyanic acid at high levels is a livestock killer, but at low levels may repel slugs and doesn't harm livestock. The clover is important in New Zealand's pasture economy, and no stock poisoning has been reported.

It resembles other vigorous, dense white clovers, does not grow as high as Ladino, but is more dense and makes a better ground cover, according to Howell. Because of its density, it keeps a better balance with grasses, tends to keep out weeds, and has consistently yielded higher than any other clover tested at Astoria (see table). Regrowth is about as fast as Ladino at Astoria.

### Seeded like other white clovers

Howell says he seeds it just like any other white clover, in a shallow but firm seedbed. It is generally spring-planted without a nurse crop, 2 to 3 pounds of clover with 12 to 20 pounds of grass per acre. Kinds of grasses

**RESEARCH at Astoria indicates that thrifty stands of New Zealand white clover will fix as much as 250 pounds of nitrogen per year in the soil from the air. Nitrogen fertilizers usually will increase the amount of grass in the mixture. Some bloating has been reported in the Willamette Valley.**

that go well include improved strains of perennial ryegrass, pasture types of orchard grass, or meadow foxtail on wetter soils. Inoculate if soils have not grown white clover.

Lime according to soil test results, with a minimum of 4 tons per acre for the Astoria area. Phosphorus will be needed and potash in some cases unless manure has been added. Nitrogen usually isn't necessary, and often results in increasing the grass in the pasture mixture. Research at Astoria indicates that thrifty stands of the legume will fix as much as 250 pounds of nitrogen per year in the soil from the air.

At Corvallis, yields have favored Ladino (see table). Agronomist H. L. Schudel reports that Ladino yields more before June 1 and from July 15 to September 15 than New Zealand white. From June 1 to July 15 and in late fall, both legumes yield about the same. Fifteen inches of irrigation water was applied during the growing season. Agricultural chemists report protein content for both varieties was the same, about 25 per cent.

New Zealand and other white clovers haven't survived in dry hill pasture tests in the Willamette Valley. So to Howell, other agronomists, and county extension agents, New Zealand white clover has a place along the coast, lower Columbia River areas, and under certain conditions in the Willamette Valley.

East of the Cascades, U. S. Department of Agriculture agronomist C. A. Larson reports New Zealand white has shown up poorly in small scale tests at the Umatilla branch station near Hermiston. The legume isn't adapted to the area's porous, sandy, irrigated soils. Trials are starting at the Malheur and other branch stations.

As a possible seed crop, the U. S. market is limited. USDA has tested the legume nationally, and USDA agronomist H. H. Rampton says the only place in the country where it compares favorably is in the mild, humid areas of the Pacific Northwest.

Seed prices favor Ladino. Only certified seed of New Zealand white clover should be used to prevent substitution of common White Dutch.

## Compare* Ladino, New Zealand White Clover Yields

| Legume | Astoria | Corvallis |
|---|---|---|
| New Zealand white clover | 140 | 89 |
| Columbia big trefoil | 120 | .... |
| Beaver big trefoil | 112 | .... |
| Ladino clover | 100 | 100 |
| Kentish white clover | 102 | 71 |
| Kentucky white clover | 97 | 89 |

* Yields are in per cent of Ladino. It's important not to compare yield percentages between Astoria and Corvallis, since OSC agronomists clipped 6 times compared to 4 at the Astor station. Astoria data is average of 1952, '53, '54 seasons; Corvallis, 1953, '54.

**GRASS is taking over Ladino-grass pasture plots at right, while New Zealand white clover at left remains vigorous and lush. Reason for decline of Ladino is slugs. Trial was at the Astoria station.**

**COMMON HOUSE FLY: His number may be up when scientists know how insecticides kill him.**

# Insects, Weeds, *Better Controlled!*

That's the possibility if basic research by OSC and other agricultural chemists finds the how and why of various chemicals' killing action.

FINDING HOW plant and insect killers disrupt invisible but important chemical changes occurring in living cells may some day give you the ability to *really* control plant growth and keep insects from developing resistance to dusts and sprays.

Those are some of the long range objectives LeMar F. Remmert, an OSC agricultural and enzyme chemist, is working on. Remmert is assisted by Charles Gregg and Irene Pierovich, and gets plenty of advice from insecticide chemist L. C. Terriere and herbicide chemist V. H. Freed. If basic research by this group, and others like it, continues to produce encouraging results, man's control over plants and insects may become real.

Remmert and his associates are getting some interesting results on "how" and "why" 2,4-D and DDT affect enzyme systems of plant and insect cells.

Enzymes are proteins, formed only in living cells. The most important thing about them is that they "grease the skids" for just about every chemical change that occurs in living cells. These chemical changes, or reactions, must happen or the cell—or the whole organism—dies. It's not hard to see, then, that 2,4-D and DDT may kill by stopping enzymes from doing their job. That's what Remmert wants to find out.

Imagine that you're standing on the edge of a huge cell where you can see a few of the important cell parts and the chemical changes going on. Off to the right is a huge, spherical nucleus that takes up about a tenth of the cell. The nucleus acts as a "mother hen" or governor for a lot that happens in the cell. You can see smaller colorless particles, called mitochondria, and still smaller ones, the microsomes, floating around in the cell fluid. Besides this, you see individual or "soluble" enzyme molecules jumping around like popcorn. There might be thousands of mitochondria and microsomes in the one cell, and you can't estimate how many soluble enzyme molecules there are.

Thousands of chemical changes are going on before your eyes. Starch, the storage product of photosynthesis,* is being attacked first by the soluble enzymes; later the mitochondria and microsomes take over. The result is that starch is changed to usable sugar, to fats, and to amino acids, or it is changed to carbon dioxide and water.

The sugars are "burned" by the cell. This process releases energy, the driving force of the cell. Fats may be stored. Later, they too can be burned for energy. Amino acids are the "building blocks" for the proteins and are needed for the cell to enlarge and divide, to make more enzymes, and so on.

These chemical changes are taking place not at random, but in a very orderly fashion. Each kind of unit—the nucleus, the mitochondria, the micro-

* Photosynthesis is the conversion of carbon dioxide from air, and water from the soil, to starch for use by the plant. Oxygen is given off in the process. Chloroplasts, green particles present in plant cells, do this by using the energy from the sun. Enzymes then convert the starch to a multitude of substances needed by the cell.

**MITOCHONDRIA photographed 5,000x by OSC's electron**
**group of enzymes that convert sugar to energy, giving the**

somes, the soluble enzymes—has its particular job to do.

**Watch mitochondria closely**

But it is the mitochondria we watch closely, for they are packed with a group of enzymes that convert sugar to energy.

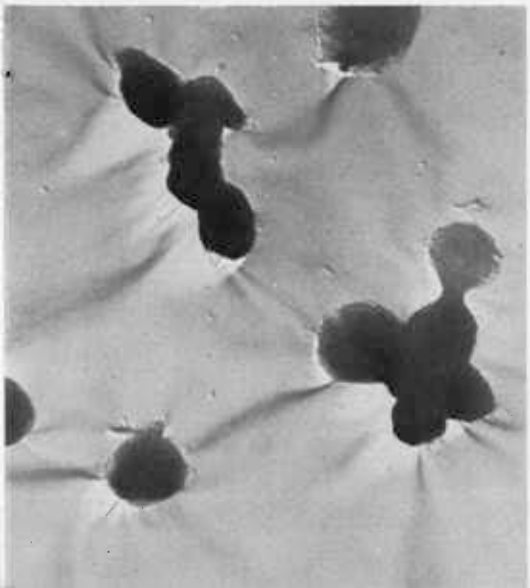
They are like an assembly line working in reverse — each enzyme takes off another part of the sugar molecule, throwing away the carbon dioxide and water—all for the purpose of releasing energy which photosynthesis stored in the starch or sugar. The mitochondria, then, are the power plants of the living cell.

Now what happens if some DDT is added to these mitochondria? That's one thing Remmert's group has been studying. After a few years of painstaking lab work to separate the cell parts in their active or natural condition, they have found that DDT prevents mitochondria from converting carbohydrates to energy. The "power plant" gets turned off! Remmert isn't sure this is how DDT kills an insect, since it takes so little DDT to kill a housefly that it is hard to imagine this effect in all of the fly's body. But he reasons that if this action takes place in a vital spot, such as nerve tissue, normal cell life stops and the insect soon dies.

Further work must be done to decide just where this finding fits into the lethal action of DDT and the development of insect resistance to DDT. Insect organs from thousands of houseflies will be studied separately. Remmert also may have to study nerve function before DDT action on mitochondria can be fully evaluated.

**AGRICULTURAL CHEMISTS Irene Pierovich and LeMar Remmert examine test tubes of extracted fly-cell fluid before placing in high-speed centrifuge. DDT, 2,4-D is added to isolate enzymes to test effect.**

**microscope. These small cell particles are packed with a cell life. DDT stops this important energy-forming process.**



Instead of applying DDT, let's see what happens when 2,4-D is added to plant mitochondria. Remmert's finding: nothing, so far. The mitochondria seem to continue their normal power plant function. But this doesn't settle the matter, says Remmert, because mitochondria must be removed from the cell for this type of study. Many artificial conditions must be used, and these may cover up the usual effect of 2,4-D on plant mitochondria.

But looking at other cell parts, Remmert's group found that at least one of the soluble enzymes is affected by 2,4-D. Normally, this enzyme causes the formation of a plant acid. The group found that 2,4-D prevents the enzyme from continuing its normal job. So far, Remmert doesn't know exactly which enzyme is involved. Because of the several hundred soluble enzymes, more than one could perform this same function.

A lot has yet to be found before Remmert knows the pattern of death from 2,4-D. With his work so far, large doses of 2,4-D have been used (much larger than a farmer puts on his field), and many complicated laboratory procedures need perfecting to separate the multitude of enzymes which are either affected or not affected.

But when scientists know exactly how weed and insect killers exert their action, they will have a better basis for developing better, more specific chemicals for this purpose.

Remmert believes from work so far that scientists and farmers have only begun their war against weeds and harmful insects. With continuing basic research at OSC and other experiment stations, man eventually may be able to achieve almost complete control of plant and insect life through application of chemical sprays and dusts.

# More Farms for Fort Rock?

Successfully working new farms even with pump irrigation will be tough, report two agricultural economists.

**HOMESTEADERS have settled Fort Rock area before—only to try elsewhere.**

HOMESTEADERS in the Fort Rock-Christmas Lake area of northern Lake County face a long, hard pull if they expect to make a "go" of farming.

Unpredictable—usually short—growing seasons,* inability to get allotments on publicly owned grazing lands, and long distances to market will combine to squeeze new irrigation farmers. Needed for success: plenty of money and good management. Even then, things will be tough, say Emery Castle, OSC agricultural economist, and Carroll Dwyer, agricultural economist for the Soil Conservation Service.

### Possible management systems studied

They base this conclusion on a study of possible management schemes for using irrigation water in the area. The U. S. Geological Survey reported in 1952 that an underground lake could probably supply enough water to irrigate 32,000 more acres—about 9 per cent of the area. Much of the area is already privately owned.

Knowledge of this water, and the coming of electricity to the area, raised the question of homesteading the public domain and developing privately held land through pump irrigation.

But which type of farming will return the most money? Answer: irrigating alfalfa for a cow-calf operation—as a few ranchers in the area are already doing.

With a cow-calf system, range land is a must. Grazing rights on public land are all in use. There's no more room.

The economists compared four types of management schemes, estimating

* Killing frosts can and have occurred every month of the year. For a 22-year period the growing season was less than 50 days 5 times—too short for most cultivated crops. The last killing frost in spring has varied from May 28 to July 26; the first frost from August 14 to October 10. Under this situation, irrigation of frost-hardy crops such as alfalfa is the only way of insuring some measure of success. Most growers get only 2 cuttings a year.

**SHORT GROWING SEASON limits the alternatives for profitable farming to a cow-calf operation in the Fort Rock area. With a cow-calf system, range land is necessary, and all available public range is in use. Irrigation may insure winter feed for many existing cattle operations, bringing higher incomes.**

the yearly profit or loss from each. The table gives these figures plus a description of each type of operation.

Costs, yields, and estimated returns were based on past costs and returns of farming operations in other intermountain areas. Spring, 1955 prices and costs were used.

Acreage figures for the three livestock farm organizations described in the table were set at 320—that needed for 100 cows. That size cow-herd would be a minimum for the area.

From the table, it appears that organization 2—raising alfalfa as cash crop—will show a slight profit each year, providing 3 tons of hay can be raised per acre. Local yield figures are not available, but other Lake County farmers average about 2 tons. With good equipment, irrigation, proper management, and a break from the weather, 3 tons or more may be possible, but not a sure thing.

Many crop and livestock possibilities were not considered, either because yields were not available (like Ladino clover seed, for example) or the growing season indicated they were not practical (like seed potatoes).

## Compare Incomes From Four Budgets

| | Farm Organization* | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| **Farm Receipts** | | | | |
| Crop sales | ..... | 10,001 | 866 | 360 |
| Livestock sales | 7,032 | ..... | 9,208 | 12,351 |
| ***Total receipts*** | **7,032** | **10,001** | **10,074** | **12,711** |
| **Farm Expenses** | | | | |
| Crop expenses | 712 | 3,600 | 1,520 | 4,280 |
| Livestock expenses | 127 | ..... | 129 | 122 |
| Feed | 3,380 | ..... | 221 | 821 |
| Hired labor | 276 | 863 | 678 | 1,479 |
| Taxes and misc. | 437 | 337 | 573 | 831 |
| Power costs | ..... | 1,154 | 509 | 1,839 |
| Depreciation | | | | |
| Machinery and equipment | 947 | 1,076 | 1,127 | 1,366 |
| Irrigation system | ..... | 596 | 371 | 996 |
| ***Total expenses*** | **5,879** | **7,626** | **5,128** | **11,734** |
| **Net Farm Income** | **1,153** | **2,375** | **4,946** | **977** |
| **5% interest on real estate** | **560** | **255** | **560** | **660** |
| **7% interest on other investment** | **2,342** | **2,003** | **3,230** | **4,892** |
| ***Operator's Return for Management and Labor*** | **–1,749** | **117** | **1,156** | **–4,575** |

* *Organization 1: cow-yearling.* 320 acres owned, none irrigated. Tillable land used for rye hay. Public range land available, and cow-yearling main souce of income. 100 cows. *Organization 2: irrigated cash crop.* 160 acres. Alfalfa for cash main source of income. No livestock. Barley grown in rotation. *Organization 3: cow-yearling, irrigated alfalfa hay.* Similar to organization 1 except an acreage is irrigated for livestock feed. *Organization 4: cow-yearling, baby beef, irrigated pasture.* Irrigated pasture replaces public rangeland. Calves fed concentrates and sold as baby beef. Besides pasture, alfalfa and barley irrigated to provide feed. 100 cows, 320 acres.

### Other risks described

Risks other than climate rise to darken the homesteading picture further. Longtime yield records with irrigation are not available. Averages are not known, so homesteaders must gamble over the long pull.

Also, well drilling costs may vary. They will depend on depth and type of formation found. If drillers run into sand, costs will soar before a reliable well is sunk.

Just making a living is only one thing. The economists report that getting started is a lot more than staking 160 acres. "Getting-started" costs will vary for real estate, irrigation, livestock, feed and supplies, and machinery, depending on type of organization.

The total estimated investment requirements: cow-yearling (organization 1), $44,600; irrigated cash crop (organization 2), $33,700; cow yearling-irrigated alfalfa hay (organization 3), $57,350; cow-yearling-baby beef, irrigated pasture (organization 4), $83,090. Detailed breakdowns will be published soon in an experiment station publication.

Combining costs and investment requirements, the economists point out that these necessary out-of-pocket costs can mean financial loss in years of low prices or bad weather.

Some ranchers in the area are using their irrigated land to produce roughage for livestock that is wintered somewhere else. In this case, the Fort Rock area serves only to supplement some other operation, and this could be profitable. Other ranchers planning to drill wells figure that irrigating will insure more income from existing cattle operations (much the same as switching from organization 1 to 3). According to the budgets in the table, this too should be successful.

**SOME RANCHERS in the area are using irrigated land for producing hay. This should insure more income from existing cattle operations. Chances for success of raising and selling only hay are small.**

# Research Briefs

**Credit Use for Early Profits • Daphne Hosts Cucumber Virus • "Poly" for Pear Packing**

## Cheapest Way to Handle "Poly" in Pear Pack Found

MOST WINTER PEAR packers agree that polyethylene (poly) bags are a good thing. But there is little agreement on the cheapest way to handle the plastic during the packing operation.

Agricultural economist George Davis and industrial engineer Don Langmo have compared two methods of using poly in 8 Oregon packing plants. Method 1, poly is positioned for the packer by extra labor. Method 2, the packer inserts the plastic.

Their figures show a cost saving for Method 1. The saving is in both total man minutes per box and in increased output per packer.

Method 1 (extra labor positioning poly) averaged .82 man-minutes per box compared to 1.1 man-minutes with Method 2 (packer handling poly). The researchers point out that using packers for poly insertion also lowers output and raises fixed costs, since they are not actually packing pears.

Comparing packer's time between poly and non-poly operations, revealed only small differences in packing time —3.55 man minutes per box, Method 1; 3.48, non-poly.

Only productive work was compared. All rest and waiting periods were excluded.

## *Daphne Found to Carry Cucumber, Alfalfa Viruses*

THAT FRAGRANT daphne plant by your house is probably loaded with a virus that could ruin the cucumber crop in your vegetable garden.

Greenhouse research trials by plant pathologists J. A. Milbrath and Roy Young have shown that *Daphne odora* from 48 different collections contained either cucumber mosaic virus, alfalfa mosaic virus, or both.

Daphne plants that differed in vigor were selected for testing. They ranged from stunted plants with yellow-mottled foliage to vigorous, healthy plants with shiny green leaves. The viruses were recovered from all plants by mashing juice from the young tip leaves and rubbing it on the "seed leaves" (cotyledons) of cucumber or other test plants. The effects of the viruses on cucumber are shown in the picture.

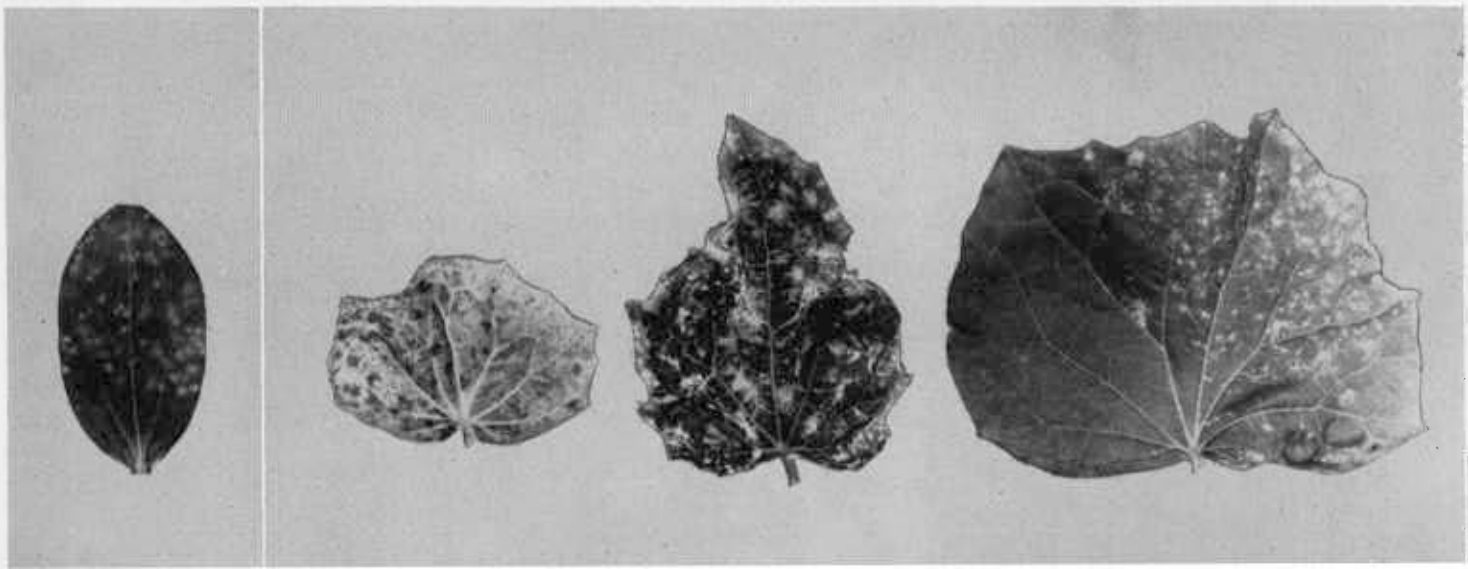
### Viruses attack vegetables

Daphne now joins various other ornamentals that are known to be infected with viruses important to food crops. These viruses frequently affect home vegetable gardens. Occasionally, serious losses have been noted in commercial bean or cucumber fields which could be traced directly to infections from gladiolus fields. Virus carried in dahlias has infected tomatoes.

Aphids that could carry the virus to other plants have been found on daphne. But the few daphne planted about the home probably will never offer the threat to commercial plantings that the larger plantings of gladiolus will.

Researchers have not been able to determine the effect of these viruses on daphne since they have not found a single plant that is not infected. Perhaps the poor color often noted is caused by the virus. Likewise, the loss of plants during transplanting might be due to the virus. Attempts are being made to find clean propagating stock for the nursery trade.

**VIRUS from daphne attacks cucumber leaves. Left is seed leaf, or cotyledon. Other three show various effects of virus. Daphne is one of several ornamentals that host viruses which attack important food crops. All daphne tested so far found infected with virus, although plants appeared healthy.**



# Borrowing Money Can Spell Early Farming Success

THOSE WHO BORROW the money they need for farming in a new irrigation project stand a better chance for success than those who slide along out of debt but on a shoestring.

But credit cannot replace savings. It only pushes a good farmer to higher profits early, says agricultural economist C. V. Plath.

Plath studied the credit use and need of 44 farmers during the first 5 years (1949-54) of operating the north unit Deschutes irrigation project near Madras.

Farmers there had special needs for money—to develop, improve, and operate their new farms. And during the first 3 of the 5 years, prices were high. Then Ladino clover seed prices dropped seriously in 1952. Many switched to beef cattle, only to suffer heavy losses when cattle prices dropped in 1951-52.

**MINT WINDROWER is typical of high-cost machinery necessary for efficient farming. Credit needs of farmers in unit near Madras show that credit with adequate savings boosted farmers to early profits.**

### Borrowing supplements savings

A group of 11 farmers, however, showed how borrowed money can supplement savings, so they could profit just as much as those with twice as much savings. Both groups of farms were the same in type, size, and quality. *The following table shows how it worked out:*

| | Low savings | High savings |
|---|---|---|
| Savings at start 1949.... | $ 6,985 | $13,119 |
| Credit used 1949-1954.. | $42,347 | $29,123 |
| Operator's debts 1953.. | $12,108 | $ 6,746 |
| Acres irrigated 1953.... | 115 | 111 |
| Farm capital 1953..... | $38,272 | $35,579 |
| Operator's assets 1953.. | $26,164 | $28,833 |
| Increase in operator's assets 1949-1953..... | $17,792 | $16,581 |
| Gross income (1952+53) ..... | $25,031 | $26,252 |

But credit can't replace savings, as some farmers found out. Five who began with less than $4,000 stuck it out for the 5 years, and were able to profit.

Those with much greater savings ($10,000 to $17,000) began profiting sooner and ended up in a much better financial position. Again, farms were similar in size, type, and quality. *This table shows their comparisons:*

| | Low savings | High savings |
|---|---|---|
| Savings at start 1949.... | $ 2,318 | $13,119 |
| Credit used 1949-1954.. | $31,419 | $29,123 |
| Operator's debts 1953.. | $ 7,190 | $ 6,746 |
| Acres irrigated 1953.... | 112 | 111 |
| Farm capital 1953..... | $24,657 | $35,579 |
| Operator's assets 1953.. | $17,467 | $28,833 |
| Increase in operator's assets 1949-1954..... | $12,215 | $16,581 |
| Gross income (1952+53) ..... | $19,681 | $26,252 |

Plath points out that farm operations on the irrigation project are examples of credit use in developing new farms during high farm prices. Other comparisons during low prices with different management skill were not made.

He did observe that farms less than 80 acres under irrigation were too small, and those with less than $4,000 saved were slowed along the road of success, but made out all right.

Of the 65 farmers who cooperated in the study when it began in 1949, 4 changed farms before the second year, 11 sold out in 1952, and 6 quit in 1953. The rest stayed the 5 years. Those who didn't stick it out weren't necessarily financial failures. Most sold because there were bad features about their farm. Other reasons: small size, poor financing, low production.

# Effect of Holding Turkey Semen Studied

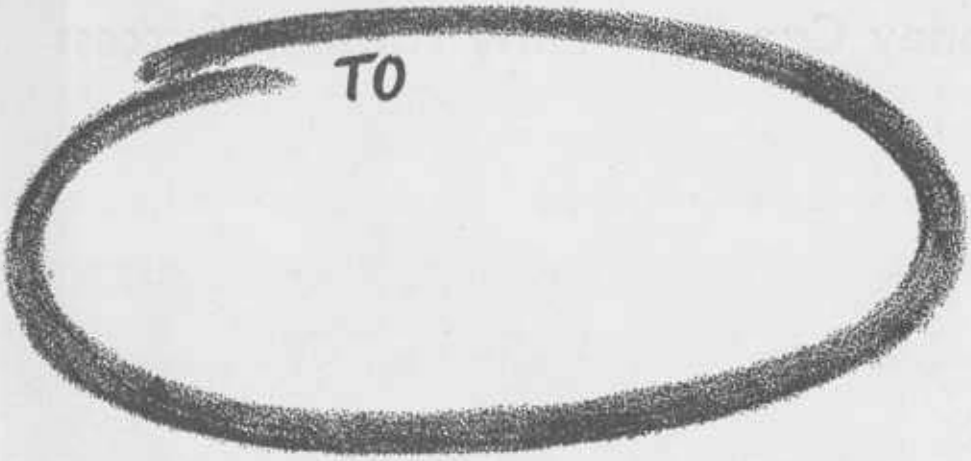
HOLDING TURKEY semen longer than a few minutes after collection before artificially inseminating hens will lower fertility, poultryman J. A. Harper reports.

Semen can be held up to 4 hours at the start of the breeding season in February without lowering fertility, but when semen is held longer than a few minutes during later months the fertility drops sharply.

Harper inseminated 4 groups of 10 Beltsville White turkey hens 5 times from February to May. He used pooled semen collected from 8 males of the same variety. Hens were inseminated with the same amount of semen (.03 cc.) immediately after collection, or after semen was held 1, 2, or 4 hours at the same temperature (55° to 60° F.).

Fertility dropped from 90 to 40 per cent later in the breeding season when semen was held, compared to a fertility range of 90 to 78 per cent with semen used immediately after collection. Fertility was maintained from 80 to 90 per cent in February, even after holding semen 4 hours.

Cause for the marked seasonal decline in semen fertility held longer than a few minutes has not been found, and additional work is being conducted.

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## Farm Outlook. . .

*(Continued from page 3)*

gin a gradual recovery. They have dipped low long enough to start some liquidation in cow herds.

Prices of sheep and lambs may average no lower than 1955. Market prices for wool are likely to be lower than last spring. The support program will be the same. It may pay to have wool graded before selling.

Some recovery in hog prices seems probable during the early part of the year. This is likely to be followed by another slump in March and April as slaughter from the big fall pig crop picks up.

Hog prices, too, have been low long enough to check the rise in numbers raised. A recent survey revealed plans for a national spring pig crop 2 per cent smaller than the large one saved last spring. There are good chances that next fall's crop will be down even more.

Oregon farmers with extra labor and low priced grain are not likely to be disappointed if they get started in hogs this year. Oregon hog prices while none too good this fall have been the highest in the nation. Our barley prices are now no higher than feed grains in many hog-producing states.

### Dairy

More milk from fewer cows seems to be a trend in dairying that is likely to continue for some time. National milk production in 1956 is likely to be greater than the record flow of '55. Oregon production has declined some in 1955 but may hold its own in 1956. Population growth probably will boost milk consumption somewhat in the year ahead. But the supply is likely to again exceed demand at current support levels. Support levels beyond the end of March have not been announced.

### Poultry

More eggs, chickens, and turkeys likely will be produced in 1956 than in 1955. Higher poultry product prices in '55 have made returns above feed costs sufficient to bring expansion in the coming year, especially in turkeys. This could very well lead to disappointing returns next fall unless many producers change their plans. Egg prices probably will compare favorably with 1955 through most of 1956. But a tight squeeze on the egg producer could come by the spring of '57.

### Feed

The nation's supply of feed grains and other concentrates has increased in recent years to a new high of 197 million tons for the current feeding season. That is about 14 per cent more than 1949-53 average.

Big feed supplies this year are the result of record carryovers, large feed grain acreage, and a generally favorable growing season. Feed prices are expected to average lower in the current feeding season then they did in the one just ended.

Here in Oregon feed grain supplies are much larger than usual due to the big increase in barley production. Also considerable Midwest surplus corn has been shipped in for storage. Grain is being used by many livestock producers to stretch our short supply of high priced hay.

### Wheat

The nation's wheat supply for the current marketing season is now estimated at 71 million bushels above last year's. Nearly half of this increase is here in Oregon, Washington, and northern Idaho, where less than 10 per cent of the nation's wheat is produced. With export prospects none too promising, it still looks like some wheat will have to move into feed-grain outlets sooner or later.

Wheat isn't the only food grain that's in trouble. The nation's rice carryover jumped from 380 thousand tons last year to more than 1⅓ million tons last August. As a result, rice acreage allotments in 1956 will be cut 15 per cent below this year's.

### Fruits and nuts

November freeze damage to fruits, nuts, and berries casts a shadow over 1956 income prospects. Prices may be higher for some kinds, but many growers seem likely to have less to sell.

Over the longer pull, prices of apples, winter pears, sweet cherries, filberts, and walnuts are likely to compare more favorably with other crops than they have in the recent past.

Vegetable prices are likely to hold up fairly well, although years of small margin between costs and returns are likely.