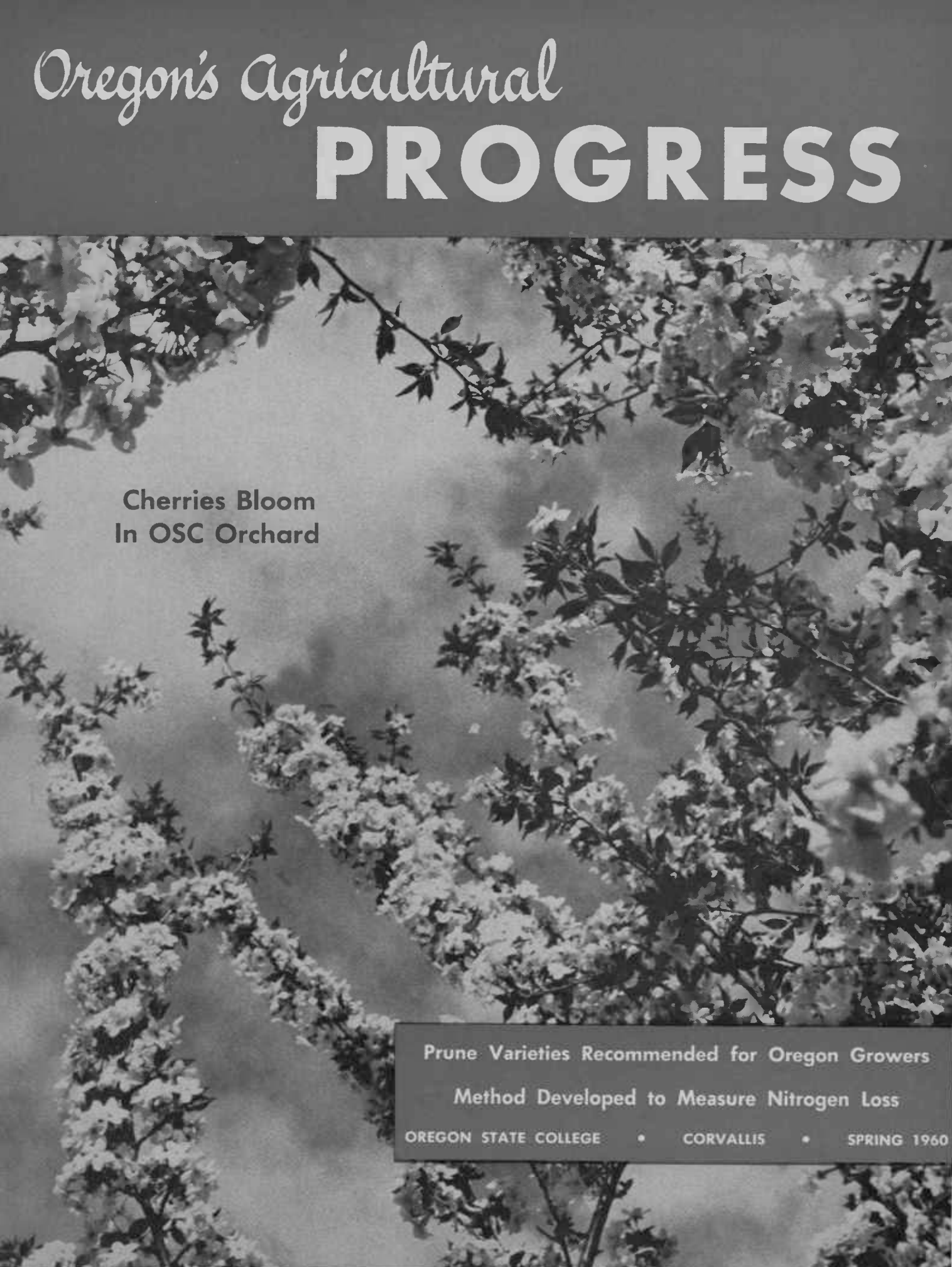


Oregon's Agricultural **PROGRESS**



Cherries Bloom
In OSC Orchard

Prune Varieties Recommended for Oregon Growers

Method Developed to Measure Nitrogen Loss

OREGON STATE COLLEGE

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CORVALLIS

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SPRING 1960

Oregon's Agricultural PROGRESS

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COVER STORY: Fruit-bearing cherries may be in danger from virus-carrying ornamentals. Virus on ornamentals can be identified only by careful examination, but damage on sweet and sour trees shows up in deformed fruit. See story page 7.

UNLESS SPRING puts more bounce into the state and national economy than usual, 1960 will be a good year but not a boom year.

Employment and income will hit new highs, but gains may be less than last year. Factory and farm goods will be plentiful. Factory production has recovered sharply from steel-strike cuts. Automobile inventories have been rebuilt. There are no shortages of other durable goods for home or farm use. This is helping to keep inflation out of prices. Main upward pressure appears to be on medical and other professional services.

Pressure has eased in the money markets. Interest charges on short-term funds are off from late 1959 highs. This should check the rise in costs of farmers' credit and could bring some relief if demands for money continue to ease.

Already the higher interest rates, plus the continuing squeeze on farm incomes, have caused a leveling off in farm property values in the main farming areas. In other areas demands for industrial, recreational, residential, and other uses are holding property values up.

Back among Oregon's farm enterprises, it's clear that a variety of economic changes is coming.

Hogs

Hog prices performed even better than we expected during the first quarter of the year, and we were among the more optimistic as the year started. There should be further gains before the market begins a seasonal decline this fall, when the spring crop starts moving in volume.

The March pig crop report removed any doubts about a sharp reduction in the pig crop this spring. True, the number bred for farrowing in March, April, and May is 1% more than intentions indicated in December; but the total for these months is still 10% less than a year earlier. The really sharp cutback—19%—was in December, January, and February pigs that will furnish most of the fresh pork this summer. This means the year's best prices should come in July and August.

Farrowings promise to lag this summer, too. Breeding intentions indicated

Cattle production on the upswing, no 1960 price break seen . . . wool prices may slip . . . egg price boom ahead . . .

Farm Outlook

By Agricultural Economist M. D. Thomas

4% fewer than last June, July, August.

The Oregon farmer who is in hogs on an efficient basis should be "sitting pretty" for the longer pull. Those who get in this year will be starting with market trends in their favor. By next spring, the best time to start probably will be past for awhile.

Cattle

Cattle numbers in Oregon and the U. S. are starting the 1960's at the expected all-time high. Nationally, the January 1 total topped 100 million head for the first time in history—fully 20 million more than a decade earlier. All of the increase is in beef cattle.

The end of the current upswing in cattle numbers is not in sight, either. Feed is plentiful; prices are encouraging although off some from 1959 highs.

No one sees a sharp price break in 1960. What happens later depends more on producers than anyone else. There is little doubt that prices will go lower unless the rapid production buildup is checked.

While the early 1960's may be disappointing to some, the longer-run looks promising for Oregon beef producers with the right resources. They are close to one of the fastest-growing, highest-paid consuming areas in the world stretching up and down the Pacific Coast from Mexico to Canada and extending offshore to Hawaii.

Sheep

Lamb prices this spring seem likely to hold close to last year's levels. Undoubtedly the best prices as usual will be past by the middle of June. In view of the gradual increase in ewe numbers, the lamb supply probably will be

up a little. Unless imports rise sharply, this increase in domestic supply is likely to offset other price-boosting forces such as less pork and high consumer income.

To grade Prime this year, lambs will not need to be as fat as in the past. To some extent, the same is true for Choice grade. These are the net results, to date, of the federal lamb-grading debate. The changes recognize consumers' growing preference for more lean, less fat, in their lamb.

Wool

The record shows that use of wool by U. S. mills rose sharply as 1960 started. How much of the resulting yarns and woolen goods were for firm orders and how much was being stockpiled for future orders is not known. Past experience would suggest that recent rates of spinning and weaving cannot be maintained without a buildup in stocks. This, in turn, suggests mills will become less anxious for raw wools later in 1960.

Meanwhile, early sales of Oregon's 1960 clips have been bringing about a fourth to a third more than a year ago. This higher price level reflects continuing confidence growing out of the strong domestic and foreign demand in 1959. Wool sales made in April and May stand good chances of bringing the biggest incentive payments as well as highest prices in 1960.

Poultry

The boom that often follows a bust in egg prices is now in the making.

In the wake of last year's terrific

(Continued, page 16)

Lamb supply probably will be up a little this year because of gradual increase in ewe numbers. Prices for lambs seem likely to hold close to last

year's levels. Best prices will be past by mid-June. To grade Prime or Choice this year, lambs will not need to be as fat as they have been in past.

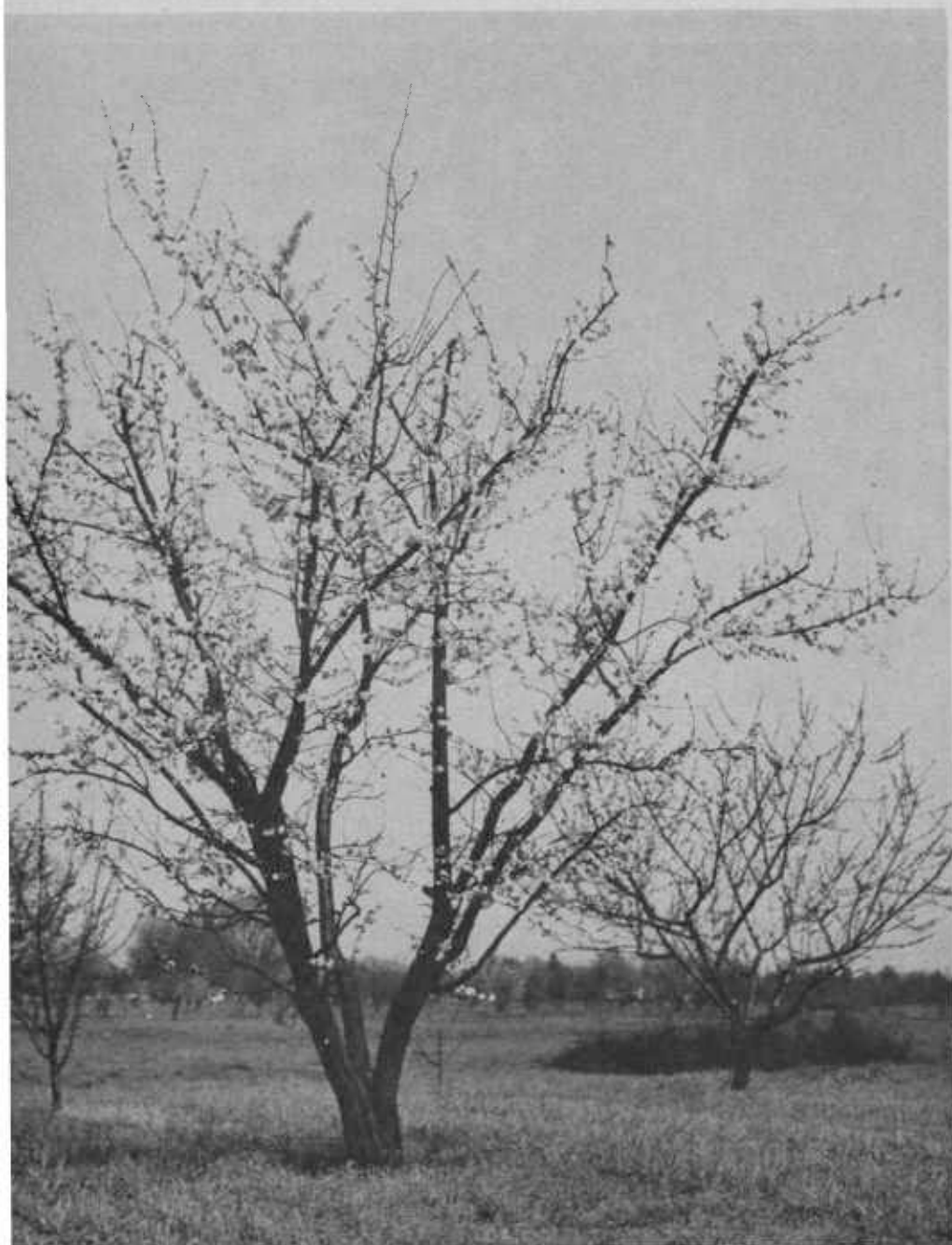


Research finds . . .

Best Prune Varieties for Oregon

Prune varieties recently tested at OSC point to more profit for growers.
Early ripening, sweetness, size, drying ratios, analyzed by researchers.

PRUNES in Corvallis research orchard bloomed about April first this year. OSC also has test orchard in Milton-Freewater where trees are tested for performance in and resistance to colder winters.



PRUNES FOR BREAKFAST this morning? Or for dessert after dinner?

If so, you were probably helping eat part of the 42,000 tons of prunes grown in Oregon last year.

Prunes are becoming an increasingly popular fruit, and new varieties being tested at OSC will add up to more profits for growers and better tasting products for consumers, says OSC Horticulturist Quentin Zielinski.

Chances are the prunes you've grown or purchased in past years belonged to the popular, dual-purpose Italian variety—some 80% to 90% of all prunes grown in the Willamette Valley during the past 50 years were Italian.

While this successful variety has been a mainstay of the Oregon prune industry, it has certain disadvantages which have plagued growers for years.

Italian prunes usually ripen in late September when pickers are scarce, and after fall rains set in. Rains, in addition to making orchards muddy, encourage brown rot—a fungus disease which invades the whole fruit.

Also, Italian prunes tend to have a rather acid flavor—many consumers prefer a sweeter taste—and fruit often clings tightly to the seed.

In an effort to overcome these disadvantages, scientists have been on the watch for a prune with these characteristics . . .

- Sweetness and palatability.
- Early ripening—preferably about September 1.
- Meat which is easily freed from the stone.
- Fungus resistance.



ITALIAN variety accounts for 80% to 90% of all prunes grown in the Willamette Valley during past fifty years. Late ripening is a disadvantage.



IMPERIAL variety was among those rated by OSC taste panel (see Table 1). It is a sweet prune, ripens about September 10, has good drying ratio.

- Good drying ratio.

Drying ratio is of prime importance to processors. The ideal prune variety would probably be about 3 pounds fresh prunes to 1 pound dried. Prunes with lots of sugar and comparatively low water content tend to hold their weight well.

Taste and processing characteristics of the prune varieties were graded by a group of OSC staff members. Fresh, canned, and dried prunes were rated

on the basis of four quality factors—flavor, texture, juice color, and general appearance (Table 1). Food Technologist W. O. Sistrunk, who worked with this phase of the research, says additional processing and tasting tests are planned for the future.

Many of the 75 varieties tested produce delicious prunes. Some outstanding ones which, according to researchers, probably will grow in popularity are . . .

Parson . . . a sweet prune which horticulturists and growers think of as a “single purpose” variety—because it is delicious dried but not so tasty fresh. Parson ripens about 10 days earlier than the usual Italian prune, has a thin skin, and a drying ratio of 3.7 pounds fresh to 1 pound dried.

Stanley . . . a sweet, dark blue, hardy and productive variety exceptionally good for canning. Stanley, out-

Table 1. Quality Evaluation of Fresh, Canned, and Dried Prune Varieties

| Variety | Approximate ripening date | Fresh plums | Canned plums | | Dried prunes | |
|----------------|---------------------------|--------------|----------------|-------------|--------------|-----------------|
| | | Drying ratio | Eating quality | Appearance | Flavor | Quality ranking |
| Merton | 9/1 | 4.5:1 | fair | fair | acid | 3.5 |
| Parson | 9/1 | 3.7:1 | poor | fair | subacid | 3.6 |
| Stanley | 9/10 | 4.2:1 | good | outstanding | sweet | 2.3 |
| Miller Sweet | 9/5 | 3.8:1 | poor | fair | sweet | 2.6 |
| Milton Early | | | | | | |
| Italian | 9/5 | 4.3:1 | very good | very good | acid | 2.5 |
| Demaris | 9/10 | 3.9:1 | fair | fair | acid | 2.9 |
| Richard Early | | | | | | |
| Italian | 9/10 | 3.5:1 | poor | poor | acid | 1.9 |
| Brooks | 9/15 | 4.1:1 | fair | poor | acid | 3.1 |
| Noble | 9/12 | 3.3:1 | ----- | ----- | sweet | 2.2 |
| Moyer Perfecto | 9/30 | 3.3:1 | ----- | ----- | sweet | 2.5 |
| Imperial | 9/10 | 2.8:1 | ----- | ----- | sweet | 2.1 |
| Italian | 9/20 | 3.5:1 | good | very good | acid | 2.3 |



FLOWERING branch of prune growing in Corvallis. Prunes are big business in Oregon, and in 1959 brought in nearly \$3,000,000 for processors. Most Oregon prunes are dried or canned for market.

standing for consistently good quality, ripens about a week ahead of Italian prunes and has a drying ratio of 4.2 to 1.

Moyer-Perfecto . . . a promising variety, large, blue, good for drying, ripens 7 to 10 days later than Italian. Moyer-Perfecto originated near Roseburg and has excellent potential for growth in the warmer southern Oregon summers, but isn't good, because of its lateness, for the Valley. Drying ratio is 3.3 to 1.

Richards and Milton . . . "early

Italian types," mature 7 to 14 days before the Italian variety and usually beat the fall rains. At least five "early Italians" have been developed, but Zielinski suggests Richards and Milton are most promising. These varieties are quite similar and many commercial plantings are being made.

Since dried prunes are sold on a size basis, large prunes are desirable for both growers and consumers. Several giant varieties have been developed recently.

Brooks . . . a firm, blue, slightly

acid prune about $1\frac{1}{2}$ inches in diameter originated near LaFayette, Oregon. Brooks is quite similar to the Italian prune and ripens about the same time. The OSC taste test panel rated it as having "fair" eating quality when canned, and it has a drying ratio of 4.1 to 1.

Edwards . . . a blue, semi-free-stone, sweet prune with early ripening characteristics, originated in California and usually produces fruit $1\frac{1}{4}$ inches in diameter. Edwards is good for fresh use and the taste test panel rated it as good to excellent on overall eating quality. More research is ahead on Edwards, and little processing data is available.

Prune processing is big business in Oregon. An average of 52,020 tons of prunes was grown annually in Oregon between 1948 and 1957, and the total cash receipts for Oregon prune processors was nearly \$3,000,000 in 1959. Elvera Horrell, OSC agricultural economist, points out that the 1959 production of 42,000 tons was a bit below the 10-year average—probably because of unfavorable growing conditions.

Oregon's 1959 prune crop was used this way . . .

| | |
|----------|-------------|
| Dried | 18,700 tons |
| Canned | 17,550 " |
| Fresh | 3,300 " |
| Home use | 1,950 " |
| Frozen | 500 " |

OSC test orchards are located in Corvallis and also in Milton-Freewater. Most prunes grown near Milton-Freewater are shipped east and to California to be sold as fresh fruits, so growers are interested in a large, sweet, early prune. The Milton-Freewater test orchard also helps horticulturists test varieties which grow well in cold weather.

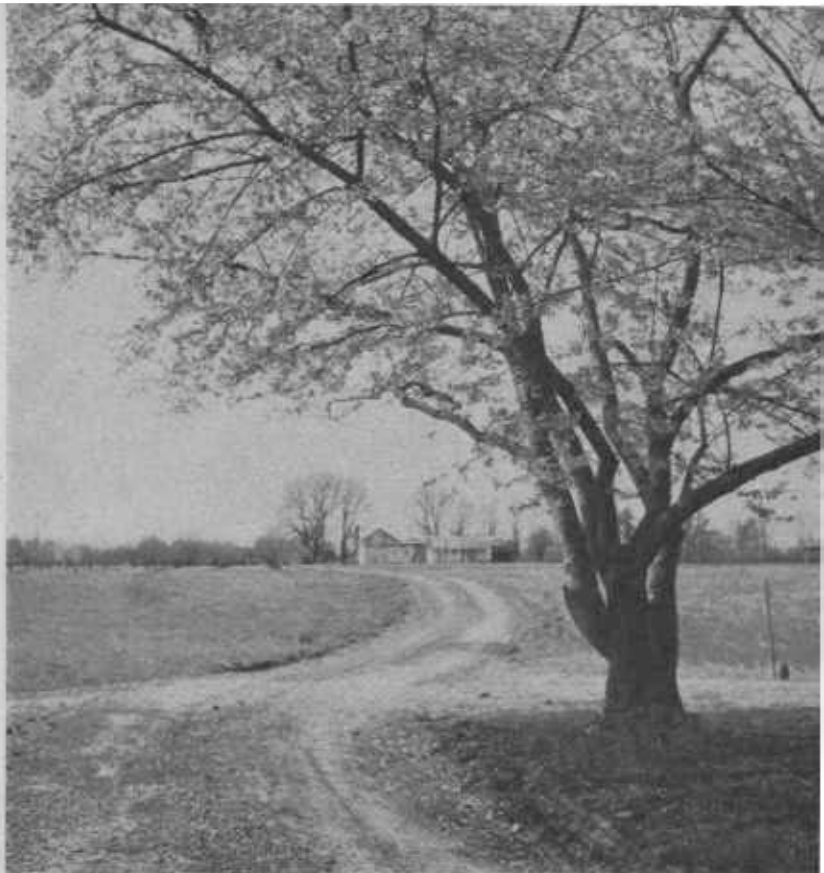
ITALIAN, Stanley, and Brooks varieties pictured left to right. Stanley is outstanding for consistently good quality, and ripens about a week ahead of

Italian prunes. Brooks is a firm, blue, slightly acid prune which measures about $1\frac{1}{2}$ inches in diameter, and answers market demand for giant fruit.



Fruit-bearing cherry trees may be damaged
says an OSC scientist, because . . .

Flowering Cherries Carry Virus



ORNAMENTAL cherry trees are nearly all infected with a virus disease which damages fruit bearing trees. The virus is usually harmless to ornamentals.

THAT BEAUTIFUL flowering cherry tree in your back yard may be doomed—particularly if fruit bearing cherry trees grow nearby.

Flowering cherries are nearly all infected with a virus disease which damages and eventually ruins fruit-bearing cherries, according to OSC plant pathologist J. A. Milbrath.

Most ornamental cherries in Oregon belong to the Japanese variety Kwanzen and produce glorious double pink blossoms during spring months. Shirofugen, another Japanese variety grown on OSC experimental farms for research and testing, blooms with frothy white flowers. Both these varieties are infected.

Virus widespread

The virus is so widespread that Milbrath believes original stock brought from Japan carried the disease. Trees planted in parks in Washington, D. C., Seattle, and other cities around the country are affected.

Flowering cherries are completely

unharmful by the virus—in fact, without extensive research it is impossible to tell whether or not they are infected—but sweet and sour cherries are seriously damaged.

An insect seems to be to blame for transferring the virus from flowering to bearing trees. K. G. Swenson, OSC entomologist, points out that a common leafhopper is the prime suspect.

First spotted on Oregon pie-cherry trees in the early 50's, the virus causes general tree decline. Early stages of the disease are difficult to identify, but severely infected trees have short, sparse foliage and little or no new growth.

Fruit shows severity

Fruit is the best indicator of severity of the disease—trees recently infected may have late-ripening cherries somewhat smaller than normal, while trees in advanced stages of the disease bear orange-pink, irregularly shaped, and insipid tasting cherries about half normal size.

Sweet cherries—Bings and Lamberts—have the same fruit symptoms, but the trees don't show general decline as clearly as do sour cherries.

Hard hit areas in Oregon include Polk County where, three years ago, 22 different orchards were infected with the virus. Another commercial growing area severely infected is the Kootenay area of British Columbia.

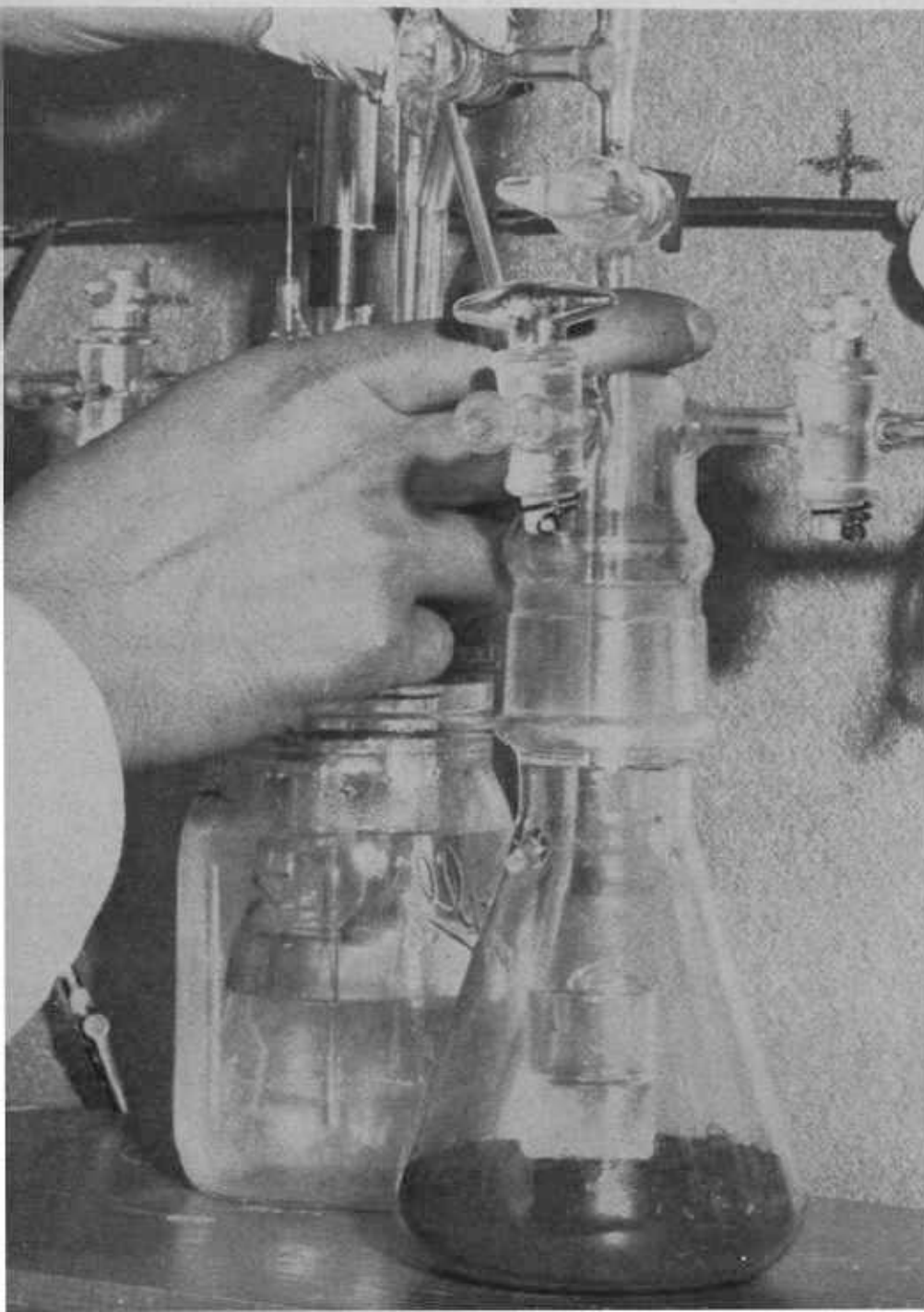
Since ornamental cherry trees are so widespread throughout the country, and since the virus itself doesn't damage the flowering tree, Milbrath's long-range research is aimed at developing a fruiting tree which is virus-resistant. Milbrath emphasizes that flowering cherries should be removed from the vicinity of bearing orchards and certainly from the neighborhood of nurseries where budwood is selected and stock propagated.

Flowering trees may have to be banned in some areas where cherry production is a major part of the economy—at least until resistant stock is developed, according to Milbrath.

New Way to Measure Nitrogen Loss

Practical method for measuring loss of nitrogen into the air has been developed by OSC scientists. Apparatus will help Oregon growers save on fertilizer.

RESPIROMETER measures gas escaping from soil and gives clues to conditions which produce the gas and cause it to escape. Will help growers choose most economic farm fertilizing practices.



HOW MUCH of the nitrogen fertilizer on your fields goes up into thin air?

Much talk is going the rounds these days about nitrogen loss—denitrification—and OSC scientists have discovered a practical method for helping growers measure exactly how much nitrogen they are losing.

This new method—which depends on a lab apparatus called a Respirometer—actually measures the escaping gas and also gives clues to the conditions which produce the gas and cause it to escape.

The Respirometer also will help growers decide which fertilizer and which specific agricultural practices are best to prevent denitrification, according to OSC Microbiologists C. M. Gilmour and W. B. Bollen.

Nitrogen volatilizes—disappears into thin air—in two main ways. Ammonia volatilizes when . . .

- Anhydrous ammonia or aqua ammonia is improperly applied.
- Ammonium sources of nitrogen are broadcast and left on the surface of alkaline or calcareous soils.
- Urea is broadcast on some soil surfaces under certain temperature, moisture, and vegetative cover conditions.
- Fertilizers which supply the ammonium source of nitrogen are surface applied with limestone.
- Ammonium and aqua ammonia are applied through sprinkler systems.

But this particular research is not concerned with ammonia volatilization.

Gilmour's research is concerned with the other aspect of volatilization—denitrification of nitrate. Scientists point out that some nitrogen loss is bound to happen under the best conditions—but certain conditions make this type

of loss more likely to occur and even encourage it.

These conditions include . . .

- Soggy, poorly drained soil.
- Crop remains, such as stubble or straw, which will decay quickly.
- Warm temperatures.

All soil contains bacteria which work on plant remains and, under warm, moist conditions, encourage nitrogen loss.

Gilmour's lab experiments show that only slight amounts of nitrogen are lost when soil is well aerated and not water-logged (Table 1).

On the other hand, these same experiments show that when nitrate fertilizer is added to wet, poorly aerated soil—such as soggy pasture areas—much of the nitrogen is lost into the air (Table 2).

Nitrogen loss shown in Table 1 is minor—and the grower wouldn't lose money on his fertilizer investment. A good crop yield, with normal profits, would cover this small loss.

Losses in Table 2 are major—and a grower probably could not cover these unless he had extremely high yields and profits.

Gilmour emphasizes that these high losses can be avoided by not applying nitrate nitrogen to water saturated soils containing plant remains.

Next step in this research is to discover exactly which farm practices tend to help or hinder nitrogen loss.

Trashy fallow, for instance, retards erosion and improves soil structure. Yet, trash left lying on wet, warm, soil encourages nitrogen loss—and the question for researchers to decide is just how much trash should be left and under exactly what conditions.

Additional research with the Respirometer will help a grower decide whether to shift from one practice to another and thus save considerably in fertilizer costs.

Gilmour points out that most Oregon growers are getting more than their money's worth from their investment in nitrogen fertilizer.

Oregon farmers spend over \$10 million annually for nitrogen fertilizers—and this money returns about \$30 million, or \$3 for every \$1 spent, through increased crop yields.



MOST Oregon growers are getting more than their money's worth from their investment in nitrogen fertilizer. Expenditure of \$10,000,000 yearly returns \$30,000,000 in increased crop yields.

So OSC scientists are vitally concerned with helping growers determine how best to plan fertilizer programs to maintain and increase this return.

Oregon growers aren't the only ones who have problems with escaping nitrogen. The situation is worldwide and

may become more severe as populations grow and greater yields become necessary. Several other agencies in the United States are now using the Respirometer to measure nitrogen loss—and the method will undoubtedly spread to other agricultural countries.

Table 1. Observed Nitrogen Losses Under Well Aerated Conditions with 10 Tons Wheat Straw per Acre *

| Soil | % N lost | lbs. N lost |
|------------------------|----------|-------------|
| Willamette silt loam | 0.9 | 3.8 |
| Chehalis silt loam | 0.1 | 0.5 |
| Cove clay | 4.3 | 17.9 |
| Dayton silty clay loam | 0.8 | 3.4 |
| Newport sand | 0.6 | 2.3 |
| Aiken clay loam | 0.6 | 2.7 |
| Palouse silt loam | 4.2 | 16.8 |

* Nitrate fertilizer 400 lbs. N per acre.

Table 2. Observed Nitrogen Losses Under Poorly Aerated Conditions with 10 Tons Wheat Straw per Acre *

| Nitrate N added lbs. per acre | % N lost | lbs. N lost |
|----------------------------------|----------|-------------|
| 400 | 45.0 | 180.0 |
| 800 | 65.0 | 520.0 |

* Palouse silt loam soil. Measurements made at end of 14 days.



TWO carloads of U. S. No. 1 Jumbo onions were packed in boxes and shipped from Ontario in this experiment. Each car weighed over 43,000

pounds. Carload going to New York arrived in excellent condition, and carload for Atlanta was slightly bruised on floor layer—didn't affect grade.

Boxes Good for Shipping Onions

Onions shipped from eastern Oregon to New York market arrived in "nearly perfect" shape when packed in boxes rather than in the traditional mesh bags.

THE BIG juicy Jumbo onions you slice for hamburgers soon may be arriving at the supermarket packed in corrugated boxes rather than in the traditional mesh bags.

Onions shipped in corrugated boxes arrive in better shape, suffer less bruising, and probably cost the packer less to ship than onions packed in the familiar mesh bags, according to a report from Agricultural Economists G. B. Davis and F. H. Dickmann.

Two carloads of U. S. No. 1 Jumbos, each car weighing more than 43,000 pounds, were packed in boxes and shipped out of Ontario recently with these results . . .

- Carload going to New York arrived in "practically perfect" shape, according to USDA specialists who examined the load.

- Carload going to Atlanta suffered slight bruising on the floor layer of the car but not enough to affect grade or appearance.

- Overall cost to packer using boxes was less because cars could be packed heavily enough to take advantage of lower freight rates.

Davis points out that original packing costs were 11 cents per hundredweight higher for boxes than for bags, but this higher cost was more than offset by lower freight rates and low transit damage.

Boxes were filled both by hand and by machine in this experiment and these methods had an effect on the final rates shown (Table 1). Crew size for either method could be reduced by one worker if a conveyer belt were set up for carloading. Also, development and use of an automatic filler would eliminate an additional man in the machine filled method.

(Mechanical box fillers tested lacked the capacity to fill boxes as rapidly as necessary—sorting and packing about 240 hundredweight per hour. A ma-

chine capable of handling this volume sells for about \$1,200.)

Since all packing was done by hand, labor estimates for machine packing are based on performance standards obtained in other studies, the research team reports.

New freight rates effective last November (Ontario to New York) encourage packers to send heavy loads:

| Minimum load per pound | Rate per hundredweight |
|------------------------|------------------------|
| 40,000 | \$1.85 |
| 36,000 | 1.93 |
| 30,000 | 2.05 |

The heavy load of 40,000 pounds has been used for bags, but Davis points out that some onions shipped this way have been excessively damaged—particularly those packed on floor layers. Some packers report loss of up to 40 bags of onions per car.

This research shows that if boxes are shipped in 40,000 pound loads, total packing and shipping costs would favor boxes over bags in 30,000 pound loads by about 9 cents per hundredweight. Bags in 36,000 pound loads would have a slight advantage over the 40,000 pound box load. But transit damage isn't taken into consideration in either of these cases—and bruising would undoubtedly be less in box shipments.

If both bags and boxes were shipped in 40,000 pound loads, the damage in boxes would have to amount to only two percentage points less than in bags to offset the difference in packing costs—and the probability is that the loss on onions packed in bags would be much greater than that on onions packed in boxes.

Market people in New York and Atlanta receiving the two carloads from Ontario favor box shipment because of the good arrival condition of the onions. One receiver thinks the boxes somewhat more difficult to handle in truck part-loads because they don't interlock in a stack as do bags. Supermarket operators and other customers receiving large shipments probably will find this no problem.

This research is one step in a long series of experiments designed to assist vegetable packers with their packing and handling problems. Application of modern technological methods will help the producer and packer save money, operate more efficiently, and will provide the consumer with a more satisfactory product.

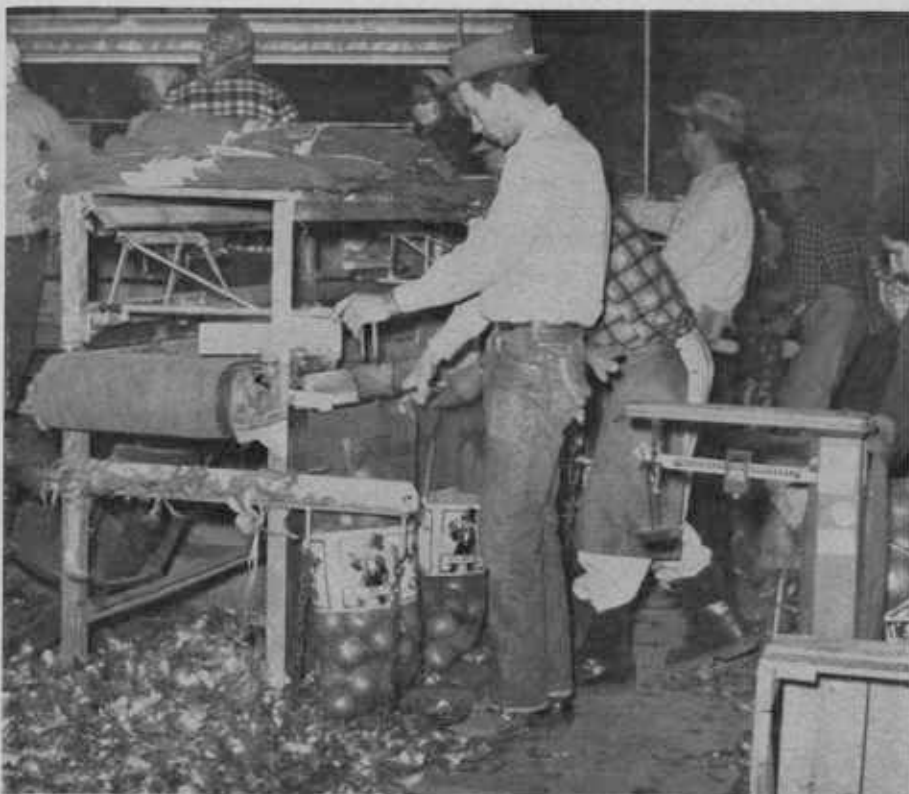
Table 1.
Estimated Costs of Packing U. S. No. 1
Jumbo Size Onions in 50-pound Mesh
Bags and Fiberboard Boxes
(Cost per hundredweight—cents)

| No. in crew | Bags | Boxes | |
|----------------------------|-------------|-------------|----------------|
| | | Hand Filled | Machine Filled |
| | 7 | 11 | 10 |
| Cost item: | | | |
| Labor | 3.5 | 5.5 | 5.0 |
| Equipment | 0.1 | 0.2 | 0.5 |
| Container | 42.0 | 51.0 | 51.0 |
| Total Packing Costs | 45.6 | 56.7 | 56.5 |



OVERALL costs to packer using fiberboard boxes was less because car could be packed heavily enough to take advantage of lower freight rates. Market people prefer to receive onions packed in boxes.

ORIGINAL packing costs were 11 cents per hundredweight higher for boxes than for bags. This higher cost was more than offset by lower freight rates and low transit damage to Jumbo onions.

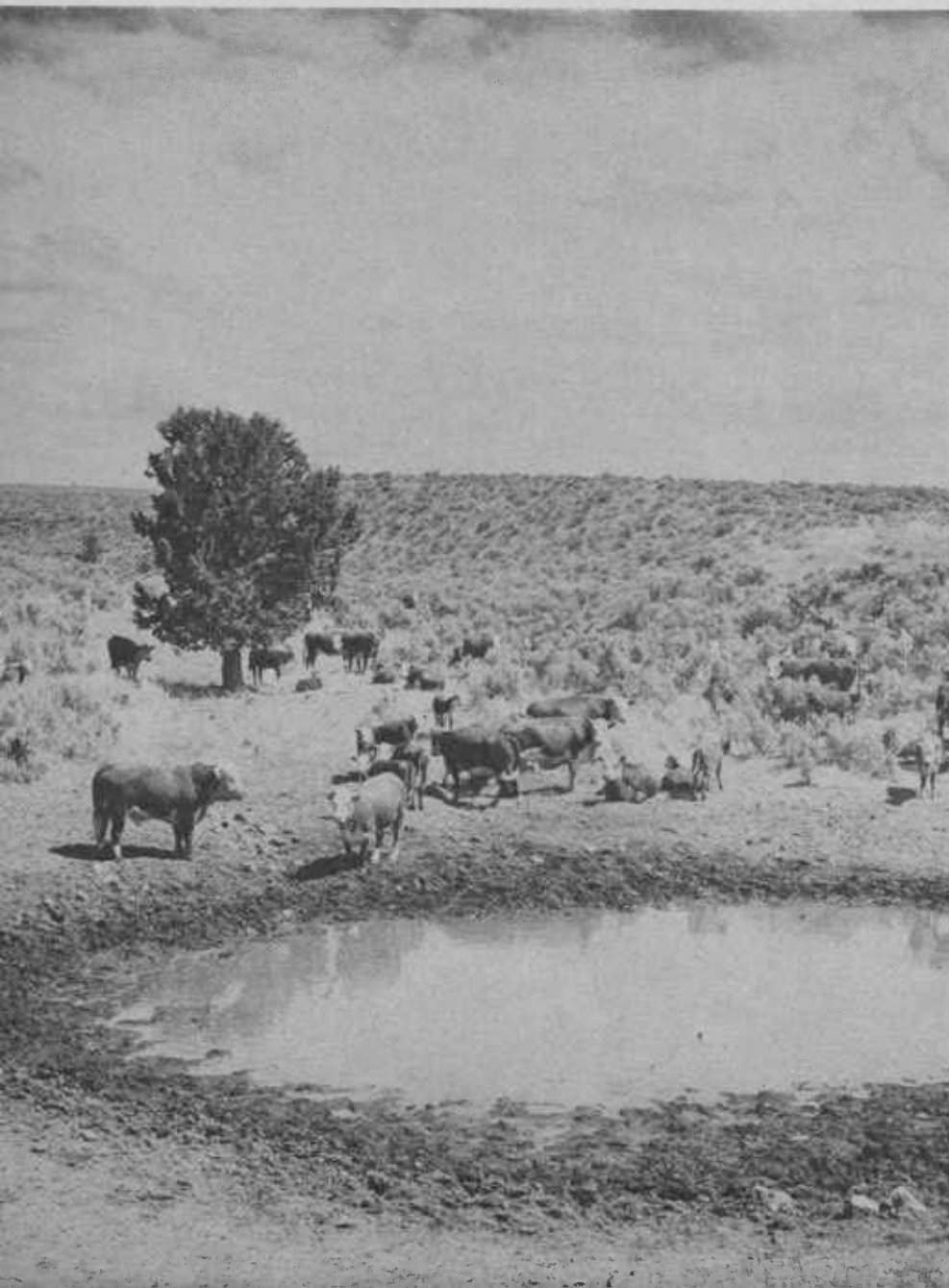


Latest Report on . . .

Anaplasmosis in Oregon

Common sagebrush tick, found in all eleven western states and in Canada, is probably to blame for spread of anaplasmosis throughout most of Oregon.

TICK found consistently on cattle in much of Oregon's infected sagebrush is *D. andersoni*. Anaplasmosis, probably carried by this tick, may be costing Oregon cattlemen as much as \$3 million yearly.



OREGON CATTLEMEN may be losing as much as 3 million dollars annually because of anaplasmosis—also known as yellow bag, tick fever, and gall sickness—according to OSC Veterinarian O. H. Muth.

This disease, which may have been brought to America by the Spanish conquistadors, does serious damage to beef and dairy herds all over the world.

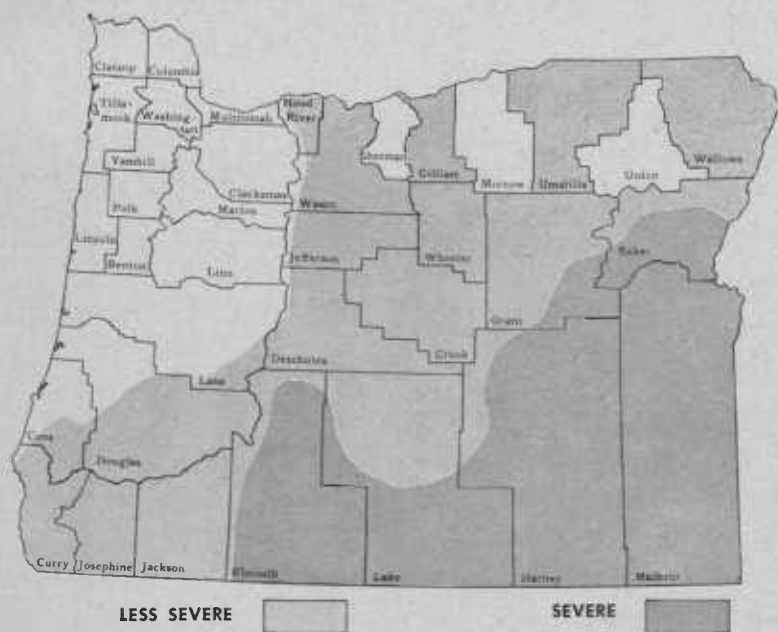
Animals suffering from anaplasmosis usually quit eating, run high temperatures, and sometimes may become violent. White-faced animals may show yellow color in unpigmented skin areas around eyes and udders. Blood of infected cattle usually is thin and watery.

First found in Oregon in 1936, the disease has since appeared in Idaho (1937), Montana (1943), and Washington (1952). So the spread has been fairly consistent and rapid.

The first case recognized scientifically in the United States appeared in the South in 1913, and until the 1930's anaplasmosis was thought to be a disease common to the southern states bordering the Gulf of Mexico. But the spread into the western Mountain states and Pacific Coast areas shows that anaplasmosis is not confined to a semitropical climate.

A common sagebrush tick seems to be the villain in the Pacific Northwest. Research by Muth and R. L. Goulding, entomologist, points to *Dermacentor andersoni*, a tick found in all or part of the eleven western states and even in Canada.

D. andersoni is probably the carrier because . . .



ANAPLASMOSIS IN OREGON

¶ Pacific Northwest is its natural habitat, and at certain times of year ticks occur thickly throughout the area.

¶ This insect is very adaptable, and can live on many different animals. Research at OSC shows it has been found on more than 50 different mammals in Oregon alone.

¶ *D. andersoni* has a long life span. An adult, failing to find an animal to which it can attach itself for feeding, can live as long as three years without food.

¶ This tick passes the anaplasmosis agent on to its offspring—so a young tick may infect the animal upon which it feeds.

¶ Also, *D. andersoni* is the only tick consistently found on cattle in much of the infected sagebrush area in Oregon. Irrigated areas which are tick free, even though adjacent to the sagebrush area, are also relatively free of anaplasmosis.

¶ Geographic distribution and seasonal incidence of *D. andersoni* correspond closely with the distribution and occurrence of anaplasmosis.

Muth and Goulding are working with selected herds from all parts of Oregon to learn more about the course of anaplasmosis in a specific herd. By using a blood test—called the “complement fixation” test—the researchers can determine the degree of infection

in individual animals, and can also follow the spread of the infection from one animal to another in the herd.

The agent which causes anaplasmosis is somewhere between a bacteria and a virus—it doesn’t fit any definite pattern and isn’t really satisfactorily classified according to Muth.

Since scientists have been unable so far to grow the anaplasmosis organism in a laboratory for experiments, it hasn’t been correctly classified and no inexpensive, sure-fire cure has been developed. Under a microscope the fever-causing organism sometimes has a dumbbell shape and a tail.

An animal which has once been infected probably will retain the disease

in its blood—even though recovery appears to be complete. Anaplasmosis is essentially a blood disease—it attacks and kills the red blood cells which carry oxygen to an animal’s tissues.

Two antibiotics—oxytetracycline and chlortetracycline—can tone down effects of the disease and can rid valuable animals of the infection. But the cost of the treatment is usually about \$60 per head according to Muth. Treatments with lesser amounts of these drugs do not cure the animal—but may prevent death and speed recovery.

An animal infected with anaplasmosis can sometimes be saved by blood transfusions—as much as 2 to 3 gallons of whole blood must be injected for the transfusion to be effective.

Muth recommends that certain precautions be taken to prevent losses from anaplasmosis.

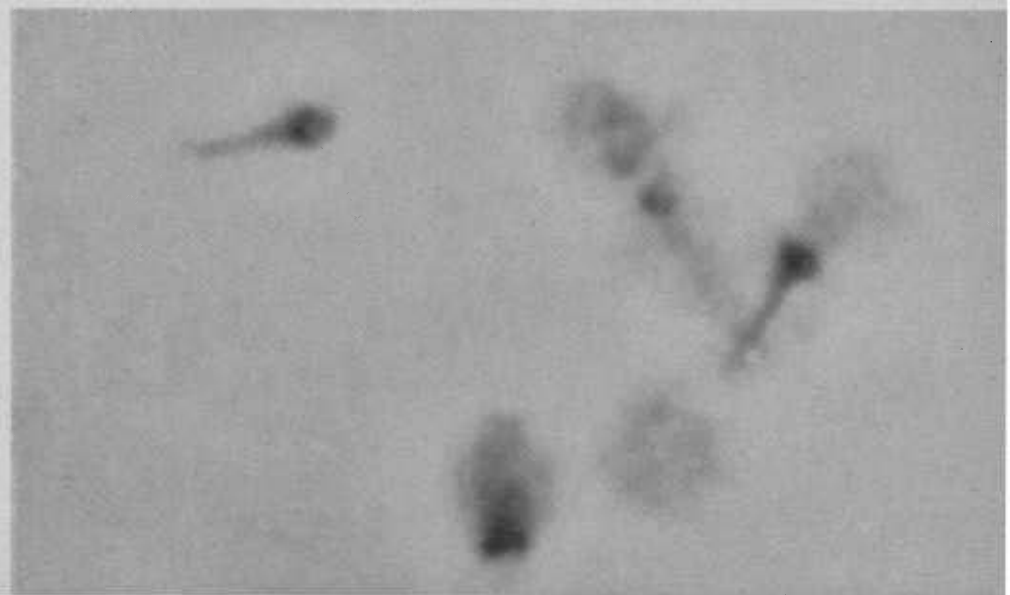
¶ Sick animals should be separated from the herd, protected from the sun if possible, sprayed to prevent transmission of the disease by insects, and given food and water.

¶ All surgical instruments—bleeding needles, vaccinating needles, de-horning and castration instruments—should be sterilized after each use.

¶ Local veterinarian should be consulted.

A research program designed to find a cure for anaplasmosis is underway throughout the United States. OSC scientists Muth and Goulding are working with researchers from California, Oklahoma, Louisiana, Florida, and the United States Department of Agriculture in an all-out effort to find a control for this devastating disease.

FEVER-CAUSING organism which is to blame for anaplasmosis occasionally is shaped like a dumbbell or has a tail. These forms, from the blood of a sick calf, are seen through a phase micro-



Research Briefs

Green bean sticks and fritters taste good

Foliar boron applications good for beets

Disease Resistant Peas Good for Northwest Growers

PEA VARIETIES bred for resistance to pea enation mosaic virus (PEMV) in New York are resistant to this disease in all areas of the Pacific Northwest.

That's the report of a 1959 study of pea producing areas in Oregon, Washington, and Idaho. Geneticist D. W. Barton, while on leave from Cornell University, worked with scientists from OSC, Washington, and Idaho to examine performance of new pea varieties.

These PEMV resistant varieties also

have higher yields where the virus is present—with increased pod set and more peas per pod—than varieties which are susceptible to the virus.

A better understanding of these pea diseases is valuable to both growers and processors. Most of the seed peas in the United States—as well as a high proportion of green peas for processing—are grown in Washington, Oregon, and Idaho. From 300,000 to 350,000 acres of peas are planted in this area each year.

1959 was excellent for this research

in the area south and east of Dayton and near Corvallis, but virus incidence was low in other Pacific Northwest areas. Results show that PEMV is common to all Northwest areas except southern Idaho and streak type viruses are common to all areas.

Varieties resistant to PEMV differ greatly in their response to the streak virus in our area. This gives scientists hope that high level tolerance to the streak viruses may be bred into pea varieties intentionally—but this will require more research in genetics and plant breeding.

Green Bean Sticks---New Aid to Homemakers

LOOKING for something new and different for dinner tonight? How about French fried green bean sticks?

Some day soon, according to Food Technologist Lois Sather, you may be able to pick up a package of frozen

green bean sticks at the corner grocery, bake them in a 400° F. oven for 10 to 15 minutes, and have a new and tasty vegetable dish to serve your family.

In addition to providing the homemaker with a nutritious and conven-

ient food, the green bean sticks give processors a new way to prepare and market green beans.

Beans which are too large or irregularly shaped to be canned or frozen in standard sized packages—but which are still of excellent quality—are pre-cooked, chopped into small pieces, pressed into molds and frozen.

Frozen molded beans are then sliced into sticks, breaded, deep-fat fried, refrozen, and stocked in the grocery—ready for the oven.

While the plain bean sticks have a pleasing taste—rather like French fried eggplant or oysters—Mrs. Sather has added special seasonings such as ham and cheese for added flavor.

Frozen green bean fritters are made by essentially the same process with a fritter batter being added before the deep frying. Fritters are also ready to serve after 10 or 15 minutes in a 400° oven.

Development of these green bean sticks and fritters is one result of an OSC research project now underway to find new and different uses for Oregon grown green beans.

GREEN bean sticks and fritters are made of beans too large or irregularly shaped to be canned or frozen in standard sized packages—but which are still of good quality. Will be on market soon.



Pear, Apple Costs Compared In Hood River Valley

HOOD RIVER COUNTY, between 1947 and 1956, produced about 61% of Oregon's apples, 39% of the winter pears, and approximately 31% of the Bartletts.

That's the report of Agricultural Economist D. Curtis Mumford who has just completed a 10-year analysis of the costs of growing apples and pears in the Hood River Valley.

A group of about 20 orchardists near Hood River cooperated in this study by keeping detailed records of their apple and pear operations.

Results of this 10-year research show . . .

- Apple growers have an average of about 15 acres per farm with an average total capital investment of \$1,157 per acre (includes land, trees, buildings and equipment).
- Total estimated production costs for apples, throughout this 10-year study, averaged 91 cents per loose box (34.8 pounds) to the packing house door. For this loose box, the grower received an average of \$1.02 for orchard run fruit.



BARTLETT pear growers in Hood River Valley had an average of eight acres in orchards and an average total capital investment of \$1,228 per acre. Ten year's data compare costs to Valley fruit growers.

- Growers of winter pears had an average of about 10 acres and an average total capital investment of \$1,297 per acre.
- Total estimated costs of production for winter pears averaged \$1.05 per loose-lug box (45 pounds), and the grower received an average price of \$1.54 per loose-lug box of orchard run fruit.
- Bartlett pear growers had an average of eight acres and an average total

capital investment of \$1,228 per acre.

- Total estimated cost of production of Bartletts, to the cannery door, averaged about \$68 per ton, and the price to the grower was about \$84 per ton.

Charts, graphs, tables, and a suggested method of figuring costs of annual production are included in soon to be published Station Bulletin 573 which outlines and discusses Mumford's research.

Foliar Boron Beneficial to Beet Growth

EVER SINCE growers started adding large amounts of boron to vegetable crops scientists have been concerned about effect of boron buildup on "sensitive" crops.

New research results show that moderately heavy applications of boron, applied in the fall, appear to have no serious effects on spring-planted beans in the Willamette Valley, according to OSC Horticulturist H. J. Mack.

Growth, yields, and boron content of bush beans and table beets to which boron had been applied have been tested for the past two years by Mack and Soil Scientists L. A. Alban and T. L. Jackson. Soil samples were also taken to show boron movement and recovery.

Two sources of boron were compared—agricultural borax and a "slowly available" boron material—on crops grown at Oregon City and col-

lege farms in Corvallis.

When agricultural borax was applied in fall at rates up to 32 pounds of boron per acre, soil samples taken the following spring showed that about 25% could be recovered in the upper 12 inches of soil.

When boron was applied to Puregold wax beans in spring, pod yield and dry weights of bean plants were less than they would have been had the boron been applied in fall.

Spring boron applications appeared to have no marked influence on yield of table beets, though boron content of leaves was increased and beet canker was decreased as boron rates went up.

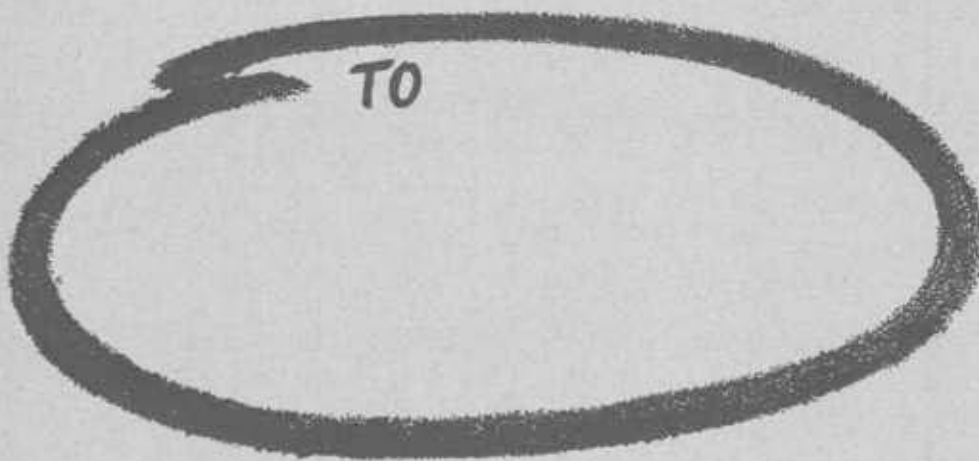
When the "slowly available" boron was added to these same crops, boron content of beans and beets was less than with the agricultural borax applications.

Earlier research indicates that foliar

sprays, used with or without soil applications, are more effective for canker control than soil applications alone. Boron materials applied directly to soil may be ineffective for control of beet canker in soils with severe boron deficiencies.

Danger from carryover of boron into sensitive crops may exist if the soil itself contains more than 1.5 parts per million of boron (as analyzed by the OSC soil testing lab). The researchers emphasize that soil type, irrigation practice, and other fertilizer practices would also influence quantity of boron build-up.

Boron applied just prior to planting or during the growing season will probably be most likely to reduce yields of sensitive crops. Greatest danger arises when boron is included with fertilizer banded at planting time, according to the OSC research team.



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Farm Outlook

(Continued from page 3)

tailspin, which sent egg prices to the lowest levels in nearly 20 years, poultrymen have cut back sharply on their chick orders this spring. The cutback appears to exceed what is needed to put eggs back into the favorable column. The margin between too few and too many eggs is quite narrow. In the short-run, those who stayed with the egg business shouldn't be sorry. In the longer-run, high prices mean larger supplies and more difficult times later.

Broiler supplies could easily step up more than demand in the next few months and take the edge off markets. Otherwise, 1960 could be a fairly good year for the broiler industry. Turkeys seem headed for trouble again this fall if production is increased as much as intentions and hatchery figures indicate. Even so, the optimism has made a good market in recent months for Oregon turkey eggs and poults.

Dairying

Oregon's dairy business appears to have passed a low point in 1959 in terms of numbers and production. With more heifers and heifer calves on farms, some further increase seems likely, although many may go as replacements in California herds. Nationally, the trend is still down in numbers to the lowest level since 1917.

Despite decreases in cow numbers, no shortages of dairy foods are in sight. In fact, consumers are supplied

with an abundance of dairy products probably at the lowest costs in history in terms of working time required to pay for the products. Ten years ago the average Oregon industrial worker earned the money required to pay for a quart of milk in about eight minutes. Now it takes only six minutes.

Wheat

1960 looks like more of the same as far as national wheat acreage and production are concerned. The situation will become clearer as the spring season unfolds. "Free-market" supplies may be tight enough to push prices up this spring. Gains are likely to be lost as harvest approaches and prices adjust to new-crop support levels expected to be 2 to 4 cents under the past year.

Feed Grains

Price-supporting loan rates on 1960 crop barley and oats will be the same as last year but corn may be around 6 cents a bushel lower nationally.

Probably Oregon oat prices will stay above support levels in the coming year. But they may not top the past winter's highs. Other feeds are being substituted for oats, especially milo (sorghum). This tends to hold prices down.

Holding prices up are prospects for a smaller acreage in the Northwest and the smallest oats acreage of record nationally—5% less than last year.

Feed barley prices are feeling the effects of lower-priced corn and milo, even more than oats. Matling pre-

miums are more chancey, too, due to production potential in Montana. All of this makes barley less attractive as an income-producer, especially in western Oregon where yield-reducing viruses are a continuing threat.

Unless corn yields are exceptionally high, the Northwest will still be a deficit area in 1960. Intended cutbacks in Washington plantings more than offset planned increases in Oregon and Idaho. California also shows signs of dropping back some, too.

Hay

Farmers in most western states, including Oregon, are planning modest increases in their hay acreage this year. These could help offset reduced carryovers but are not likely to push 1960 prices below last summer's levels, especially if livestock prices hold up as well as now seems likely.

Potatoes

Late potato growers are showing more restraint than sometimes following a year of favorable prices. Early plans, however, do total out to a slight increase in acreage. This doesn't rule out chances for fair prices, but chances would look much better if other states were following Oregon growers' intentions to cut back 5%.

Growers this past winter showed good strategy in marketing their potatoes. Bargaining from the strength growing out of a moderate supply, they were able to get the most out of the market without pushing retail prices up enough to cut sales.