

Oregon's Agricultural **PROGRESS**

**Once Thought Harmless,
These Beetles Now Pests**

Story, Page 15



Winter • 1954

OREGON STATE COLLEGE • CORVALLIS

Oregon's Agricultural
PROGRESS

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Cover photo by Frank P. McWhorter, OSC plant pathologist. Beetles are four times actual size.

Wheat
Barley
what



HOW ARE Oregon farmers going to handle the barley they plan to raise this year? If you are a grain farmer and have not answered this question yet, there is still time to plan wisely.

Why a barley problem?

It is almost certain that there will be more grain on hand next summer than ever before.

Wheat is not moving out of storage as fast as it did a year ago. Exports are dwindling. Shipments during the first half of the season have been much below last year and prospects for the remainder of the season are far from bright.

The increase in old wheat stored in elevators and bins next summer seems likely to equal, and may exceed, the reduction in the new crop likely to result from planting restrictions.

Even in 1953, there was not enough storage room for all our wheat at harvest time. Some had to be left outside.



to do in 1954

But barley will be an even bigger problem in 1954.

A big increase in barley plantings is expected on land held out of wheat. No official surveys are scheduled before March, but opinions range all the way that from 20 to 90 per cent will be planted to barley. Past experience indicates that an increase of at least 50 per cent in Oregon's barley acreage is a safe guess for 1954. This probably means about 6 million additional bushels of barley to store and feed—about twice as much after brewers' needs are met.

Most of this increase will come in Oregon's wheat belt, the Columbia Basin counties. This will be largely feed barley. But some of the increase will come in other counties, too.

This large barley crop probably will come on top of a little larger carry-over of old barley in the state.

Considerably more barley was on farms and in warehouses in western Oregon at the end of 1953 than a year earlier. This barley has been a good feed buy and is being used faster than last year. Yet, it will take an even greater step-up in feeding to bring stocks down to last year's above-average level by next July.

Malting barley buyers are not likely to purchase and store more barley at harvest time in 1954 than they did in 1953.

Altogether, the supply of wheat, barley, and oats which will be handled and stored adds up to a 10 per cent increase over 1953. If all this increase were stored on Oregon farms, it would

require 30 per cent more space than used in 1953—when too little suitable storage was available.

That is why it is important to start thinking and doing something before you are in a jam.

What to do

There are several things you can do.

If you are a grain grower, you might:

► **SELL WHEAT.** This will help create more room for a new crop. Sales postponed may be sales lost. Sell whenever market prices approximate the return that can be netted from government loans. Chances for wheat prices to edge much above loan values in 1954 are slim.

► **DOUBLE-CHECK STORAGE.** Determine the amount of commercial elevator and warehouse space you can expect for all kinds of grain. Including your farm storage, will this be enough?

► **CONSTRUCT NEW FARM STORAGE.** Adequate storage is necessary whether you expect to qualify for government loans on your grain or plan to feed later. Government support prices on '54 barley nationally will be \$3.75 a ton below '53 levels. County rates have not been announced, but they probably will net an average of \$45 a ton to Oregon farmers. To become eligible for a support loan, adequate storage must be provided—either by warehouse or elevator—or on your farm. If you cannot line up adequate storage, it may pay to build a sealable bin. Sec your county Agricultural Marketing Committee (PMA) representative for

sealing requirements before you begin building.

If you are a livestock or poultry producer, you might:

► **SUBSTITUTE BARLEY.** You may save money by replacing some or all of the corn, oats, or wheat in your ration. Barley is already a good feed buy. It may be an even better buy next fall. Barley in the fall of 1953 cost Oregon feeders and feed mixers no more than corn cost in the Midwest. It has usually cost \$10 to \$20 more.

► **RAISE MORE TURKEYS AND CHICKENS.** Lower-priced barley puts you in a much better position to compete with producers in other areas where feed grains have been cheaper. We do not produce as many eggs and broilers as we use in Oregon. Prices are higher here than many other states.

► **FEED MORE BEEF AND LAMBS.** Oregon has shipped out many cattle and sheep for feeding and finishing elsewhere. Larger supplies and lower prices of barley now put you in a better position to feed here.

► **RAISE MORE HOGS.** Oregon ships in most of its pork. Lower barley prices will help you compete, but hog prices will be much less attractive in a year or two. Be careful not to jump from a barley problem to a hog problem.

► **STORE FOR FEEDING.** Grain raisers may be willing to sell barley and other grains at harvest time at prices that will make storage on your farm attractive and profitable. You may want to convert some space for temporary storage or to build some new bins.

Farm Outlook

By Agricultural Economist M. D. Thomas

THE FARM price-cost squeeze is not likely to get much tighter for Oregon farmers the year ahead. But don't be too surprised if the parity ratio drops below 90 during the first part of 1954. It slipped to that level this November for the first time since May 1941. Barring bad weather or an unlikely break in food buying, most Oregon farm families should have about as much spending money in 1954 as in 1953. Even so, be careful about new debts and over-use of credit.

Grain

WHEAT FARMERS have probably seen the last of the lush years for awhile. Neither high support prices with acreage controls, income certificates, nor other proposals now in sight will rate the \$73,000,000 value placed on the 1953 crop from more than a million acres of Oregon's land in wheat. Be set to store barley and other grains to benefit from Government loans and avoid low harvest-time prices.

Livestock

DAIRYMEN can expect lower feed costs. Seeds needed for improving pastures are cheapest in a long time. New ways of handling silage are being found, too, but don't invest too much in gadgets and gimmicks until they are proven.

POULTRYMEN may run into trouble by the end of the year. The favorable egg-feed ratio has been too good to last. There is real danger that too

many chickens will be raised in 1954, even though Oregon farmers still don't produce all the eggs used in the state. Better stay big or stay small in the egg business—jockeying for a new position is likely to bring trouble. It is a poor time to get started. Next year should be better.

TURKEYS. Wait before making final decisions on turkeys. The U. S. Department of Agriculture will gather and report much new information during the next three months. Meanwhile, take good care of your breeder hens. December markets and smaller cold storage holdings are likely to encourage poult buyers in other states. Any increase in turkeys raised is almost certain to mean lower prices next September. More hams will be in sight by that time, too.

HOG numbers are expected to increase. Here again the favorable feed-hog price ratio has lasted long enough to have its customary effect. The U. S. Department of Agriculture pig-crop report released December 22 reveals plans for a 6 per cent increase in the national pig crop in the next six months. This means 12 to 15 per cent lower hog prices next fall and a downward trend for two or three years, other things being equal.

BEEF. The larger pig crop will not hurt beef prices this spring. Lower beef prices will come later. The indicated increase in pigs might lower

cattle prices slightly next fall. Actually, the supply of pork this spring will be smaller than last spring.

Cattle marketings have held close to the gains of one-third over 1952 that were expected earlier. This means about 36 million head of cattle and calves have been slaughtered this year. And most of the meat has been eaten, too. Stocks of frozen beef are smaller than a year ago, but more is in cans as a result of Government purchase programs.

Cattle numbers may show a slight drop when the figures are released about mid-February. Slaughter has about equaled the 1953 calf crop and fewer feeders are in feed lots. Fed cattle prices may weaken, but are not likely to stay down long this spring. Watch markets closely when selecting the time and place to move.

LAMBS. Creep-feeding western Oregon lambs this spring should pay even better than usual. Barley and millrun are priced right for this job. Your neighbor may have some barley to sell if you do not have what you need. Lamb prices this spring should equal the first half of 1953, but it will be good business to market by July or before a new run of grass cattle starts pushing cattle and lamb prices down.

Grass and legume seed

SEED CROPS have been in trouble. Adjustments were needed, but growers may have been getting out of tall fescue too fast. It looked good in last fall's southern drouth and big cuts have already been made in seed acreage. Check-up on newcomers like Merion bluegrass and annual bromegrass. They will sell for less money in a year or two, but may be better doers than other seed crops. Red clover is likely to look better next year. Fine fescues prices are threatened by large Canadian crops, but much depends on U. S. bluegrass which may have been hurt by drouth.

STRAWBERRIES are still a good bet for growers who boost yields. California plants froze more berries than ever before and growers are planning another acreage increase in 1954. Boosting yields, even if it means planting something besides Marshall's, is important. Housewives have not been so fussy about quality and many are taking more and more of the pack.

Cattle numbers may show a slight drop when the figures are released about mid-February.



Think Through Your Farm Program

FARMERS, farm leaders, various agricultural industry advisory committees, and other groups have been closely examining our national farm program these past months. Our present agricultural legislation, which has grown out of our experiences over more than a quarter of a century, has made many important contributions to agriculture. Contrary to what many folks believe, our present program—the Agricultural Act of 1949—has not been changed this past year.

Farm programs cannot serve agriculture well without changes from time to time. Farm programs should never become static. The development of an effective farm program is an evolutionary process and the critical review of the past year is a part of this evolutionary process. When Congress reconvenes, farm legislation will undoubtedly be a major item of business. Many proposals will be submitted. It is likely that compromises will be reached and some changes will be made to the present legislation.

Five "rules of thumb"

How can farmers better understand the trend and significance of discussion on farm policy? Perhaps a few "rules of thumb" may help serve as guides for appraising farm program proposals. The five guides listed below are not inclusive. Some people may give them interpretations that are different from those given here. These are offered, however, with the hope that you will think through these proposals from the standpoint of farm and national welfare.

▶ DOES THE PROGRAM ENCOURAGE INDIVIDUAL FARM INITIATIVE?

Most people feel that every individual most contribute something to his economic security. In fact, our country has become great because individuals have been encouraged to improve their own welfare through the strength of their personal efforts. The

desire of the individual in this country to produce—the will to work—has been a major human resource that has aided both farm and national prosperity.

Does the program stimulate the individual to do his best as a farmer? Does he have a free choice in the crop and livestock enterprises which he may follow on the farm? Does the program help the individual farmer plan his own farm operation to improve the level of living for his family? Does the program shift decision-making from him? These are important considerations in appraising any farm program.

▶ DOES THE PROGRAM CONTRIBUTE TO IMPROVEMENTS IN PRODUCTION AND DISTRIBUTION OF FARM PRODUCTS?

Agricultural production is about 40 per cent greater than before the war. We are producing 80 per cent more wheat, 90 per cent more corn, 30 per cent more milk and 40 per cent more eggs per hour of labor than we did in the 1930's. We are doing things on farms today that nature could never have done alone. Ours has been termed the "Golden Age of Agriculture."

Our farm programs over the years have encouraged farmers to adopt scientific improvements which have revolutionized agricultural production and distribution. Improvements in farm equipment, in fertilizer use, in pest and disease control, and in plant and animal breeding have contributed greatly to the abundance of our agricultural production.

Any change or modification of our present farm program should continue this freedom, plus the incentive to adapt new ideas quickly into our production and distribution patterns.

▶ DOES THE PROGRAM CONTRIBUTE TO WISEST RESOURCE USE?

Our agricultural resources in this country are limited. Today we are using approximately the same crop acreage we used 40 years ago. We may be using the same crop acreage 25 years

hence. As a growing nation, it is important that we manage and use our resources wisely.

Farm programs that do not encourage the wise management of our resources simply borrow from tomorrow's production. As our population grows, the pressure on our food production becomes greater. A desirable program must achieve a reasonable balance between the conservation of our resources and the use of those resources. A program which encourages the production of food which is not needed and is ultimately wasted does not reflect the wisest resource use.

▶ DOES THE PROGRAM ASSURE CONSUMERS AN ADEQUATE FOOD SUPPLY AT REASONABLE PRICES?

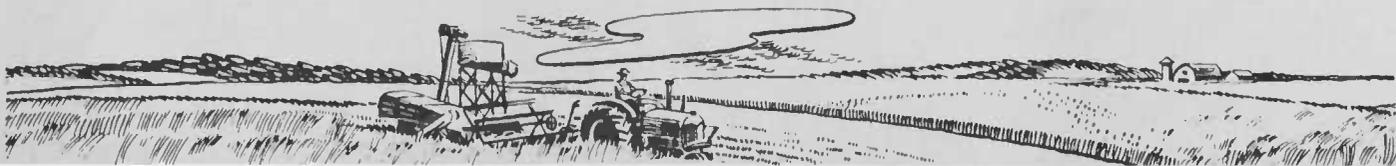
The consumer has an important stake in having an adequate diet at reasonable prices. If our nation is to continue strong and if the will to work is to be preserved, it is important that nutritional levels be high.

Any farm program that tends to encourage monopoly in agriculture can place farmers in a vulnerable position. The maintenance of high farm prices (and high food prices) through restricted production will ultimately be attacked vigorously by consumers, since the cost of food is one of the big items in the average family's budget. But consumers must realize that farm prices must maintain an income for farmers that will stimulate abundant food production.

▶ DOES THE PROGRAM ADD STABILITY TO BOTH PRICES AND INCOME?

Agricultural prices and income often vary widely from year to year. In periods of inflation farm prices rise faster and to greater heights than do farm costs. In periods of deflation prices fall rapidly while costs are slow to decline. This latter situation results in excessive hardship to agriculture during periods of falling farm prices. It is important that farm programs

(Continued, page 20)



Nematodes

Microscopic Now Trouble

ABOUT 5 years ago, a Multnomah County daffodil grower proudly showed a Portlander his acreage of golden-tipped plantings. Wandering through the rows, the visitor asked: "What's the matter with those over there?" A 30-foot circle of plants looked sick. Stems were pale green, some brown and yellow. All were stunted.

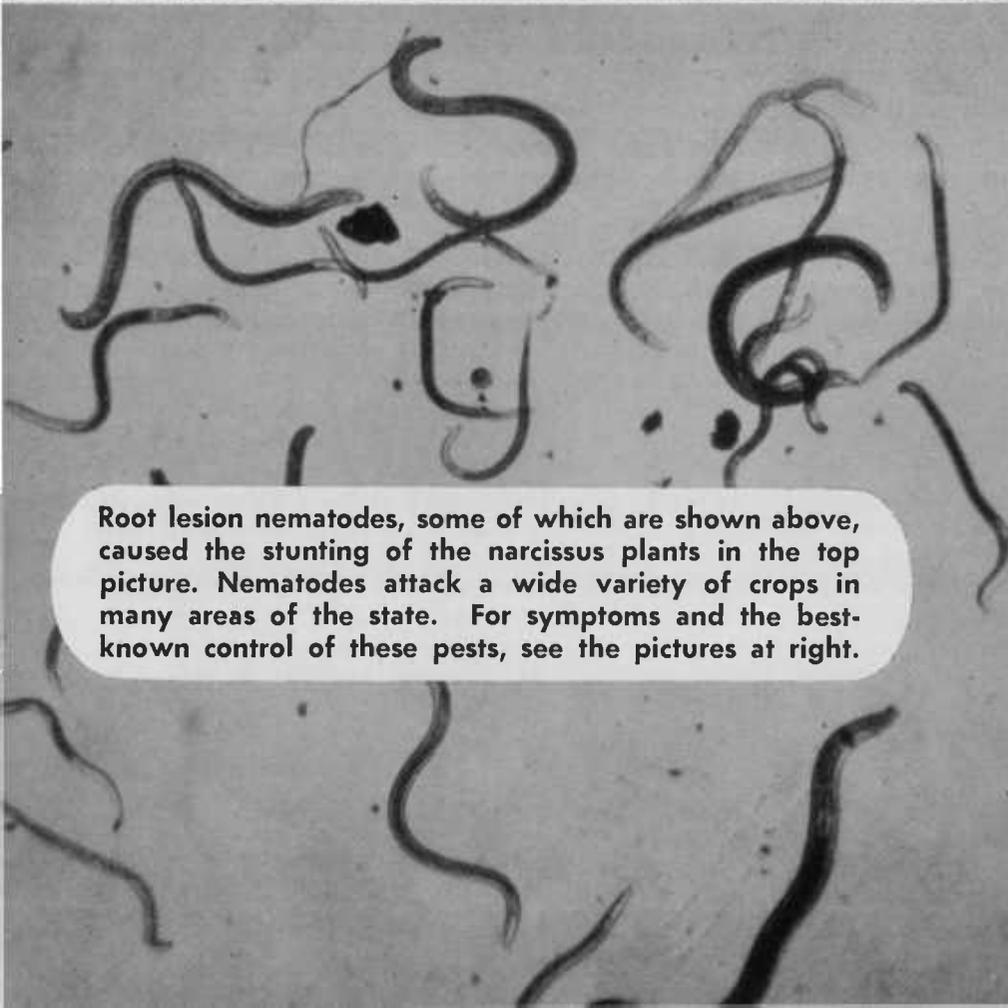
"Don't know," the grower replied. "Been there for a couple of years. Shot of fertilizer oughta perk 'em up."

But fertilizer didn't work. The circle of sick and dying plants grew. Last year this grower quit raising daffodils.

His flowers didn't lack essential fertilizers. They were victims of nematodes—microscopic, thread-like worms—distant cousins to the hookworms and intestinal worms that have plagued man for centuries. Only recently have

Seed nematode. Symptoms: right is infected seed head of Astoria bentgrass. Left seed head is normal. Possible control in Astoria bentgrass: prevent seed formation for one year. Control in Chewings fescue: burn stubble thoroughly. Seed nematodes attack mostly seed, cereal crops.

Root lesion nematodes, some of which are shown above, caused the stunting of the narcissus plants in the top picture. Nematodes attack a wide variety of crops in many areas of the state. For symptoms and the best-known control of these pests, see the pictures at right.



Pests

Oregon Farmers

they seriously crippled plant production in Oregon.

OSC nematologist Harold Jensen has found that nematodes have attacked these crops in the following counties:

- BENTON, Ladino clover.
- CLACKAMAS, Regal lilies, strawberries, narcissus, carrots, parsnips.
- CLATSOP, narcissus, strawberries, Croft lilies, Seaside and Astoria bentgrass.
- COLUMBIA, Astoria bentgrass, strawberries.
- COOS, iris.
- CROOK, potatoes.
- CURRY, Easter lilies, narcissus.
- DESCHUTES, Alsike clover.
- DOUGLAS, cyclamen, Christmas begonia, narcissus.
- HOOD RIVER, pansies.
- JACKSON, strawberries, peonies.
- JOSEPHINE, narcissus, gladiolus, cyclamen, carrots, Ladino clover.
- KLAMATH, potatoes.
- LAKE, snapdragons.

LANE, Christmas begonia, narcissus, chrysanthemums, Croft lilies, cucumbers, tomatoes.

LINCOLN, Speciosum lilies.
 LINN, coleus, cyclamen.
 MALHEUR, potatoes.
 MARION, Parsnips, strawberries, celery, boxwood, gooseberries, chrysanthemums, Chewings fescue, cyclamen.

MULTNOMAH, juniper, boxwood, cherry, pyramidalis, Alwoods cypress, clematis, narcissus, astilbe, Christmas begonia, Croft lilies, chrysanthemums, African violets, onions, carrots, parsnips, lettuce.

UMATILLA, peonies, snapdragons, cucumbers.

WASCO, cyclamen.
 WASHINGTON, narcissus, strawberries.
 YAMHILL, Croft lilies, Christmas begonia, snapdragons.

Many nematodes are plant parasites—usually living within the plant. One type, however, lives entirely outside the plant. It spears the plant with a needle-like mouth part, which sucks plant juices for food. Most nematodes live within the plant tissue cell, feeding from their mouth parts on nearby cells.

They're so small that 50 stacked end to end would almost equal an inch. It takes from 1 to 3 months to complete an egg-to-egg life cycle.

Nematodes injure three ways

Jensen says nematodes injure plants three ways: (1) They suck juices needed for plant growth. (2) The punctures made by the nematode's feeding mechanism provide openings for plant diseases. (3) The punctured

or infected tissues become malformed and do not function as they should.

Any one or combinations of the three types of injuries will limit plant growth. Nematodes seldom kill plants, according to Jensen, but directly or indirectly, they sap a plant's strength until it's stunted, or until more fertilizer, water, and care are needed for proper growth. And even after that, plants usually will remain unproductive and unprofitable.

Man, more than any other agency, has helped to spread nematodes from crop to crop and from area to area. The nematologist says planting the same crop year after year encourages rapid increases on host plants. Also, land clearing, irrigation, cultivation, and other soil-moving practices have helped spread the pests. So has shipping of infected bulbs, tubers, roots, and plants.

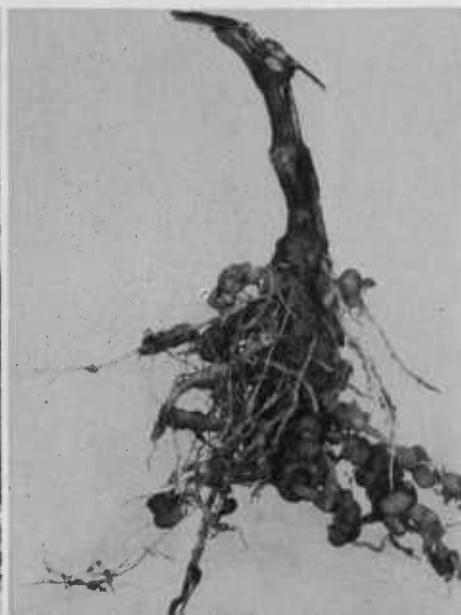
But all nematodes aren't bad. According to Jensen, there are hundreds of beneficial species for every harmful one. Some are breaking down organic matter into plant food, while others prey on harmful soil microorganisms—including other nematodes.

You can class the several kinds of nematodes attacking crops in Oregon into four groups according to type of damage. How you can spot them, and a suggested control, are shown or listed below. If in doubt, Jensen advises seeing your county agent.

Leaf nematode. **Symptom on Easter lily below: leaf dieback.** Control: put bulbs in 111° F. water-formaldehyde bath for one hour. **Symptom on Christmas begonia and chrysanthemum: brown leaf blotches.** Control: spray a phosphate insecticide on leaves. Be sure to follow directions.

Stem nematode. **Symptom: Enlargement of stem and fruiting stalk as on Marshall strawberry plant below.** Best control for strawberries: never seed red clover in a rotation, buy only disease-free plants; for narcissus: use standard hot water-formaldehyde bulb bath for nematode control.

Root-knot nematode. **Symptom: Galls on plant roots, like those on cucumber plant below.** Best control: fumigate soil with either Ethylene dibromide or Dichloropropane-Dichloropropene. These materials are sold under several brand names. Be sure to follow directions on container.



TRY BIRDSFOOT TREFOIL



a long-lived legume for Oregon

NEED a long-lived legume that will grow on heavy, wet soils? That will yield high quality hay? Or that isn't known to cause bloat?

Then try birdsfoot trefoil. Because it grows well on many soils that won't produce alfalfa, this lotus is often called a "poor land" legume. But it responds to fertilizing, liming, drainage, irrigation, and proper management.

Two catches: Birdsfoot trefoil is often hard to get started, since seedlings are low in vigor. Also, seed is hard to harvest, and certified seed acreages of improved varieties are limited.

But research at Oregon State College may help unravel the knotty problems which keep this legume from becoming a favorite among Oregon farmers.

Up to now, the experiment station has released one variety—Granger. Until "how to plant," "how to manage," and "how to harvest seed" research findings are completed, recommendations on how to handle the legume are based primarily on observations and reports from county extension agents and from farmers who have raised it successfully.

Six kinds of birdsfoot trefoil (*Lotus corniculatus*) are known in Oregon.

► **GRANGER**, developed by U. S. Department of Agriculture agronomists H. A. Schoth and H. H. Rampton, was

released by the OSC agricultural experiment station in 1951. It originated from stocks imported from northern Europe. It was chosen from many strains for its rapid scedling growth (compared to other varieties), and for its long life, high forage yields, long growing season, and wide adaptation. It was tested for 10 years before being released by the station.

► **DOUGLAS, OR PARKER**, was developed by J. R. Parker, Douglas County extension agent. It's being grown on 3,500 to 4,000 Douglas County acres. From commercial stock of unknown origin, Parker selected superior plants for the variety. It's similar to Granger, but isn't certified because a permanent source of Foundation seed stock has not yet been established.

► **CASCADE** was recently released by the Washington agricultural experiment station. Plantings in Oregon are limited. It's also similar to Granger.

► **EMPIRE** is a New York variety which yields well, but hasn't the long growth season of Granger or Douglas.

► **SOUTHERN OREGON NARROWLEAF** probably was introduced accidentally in other crop seed. It is grown primarily on about 3,300 acres in Jackson County.

► **EUROPEAN BROADLEAF** is imported. It's not as reliable a performer as local varieties.

Granger, Douglas, Cascade, and European broadleaf all look about the same. They are broadleaved and upright. Southern Oregon narrowleaf tends to lie flat along the ground. Empire is a broadleaf, but is intermediate in growth—some plants are upright, some prostrate. It's also denser than other broadleaf varieties.

Stems of birdsfoot trefoil are smooth and fine; they vary from six inches to three feet in length. Pea-like flowers are greenish yellow or orange in the bud, turning to yellow or yellow streaked with red at full bloom. They appear in clusters of 3 to 7 at flower stem tips. The flower develops a seed pod. Pod clusters resemble toes of a bird's foot—hence the name, birdsfoot trefoil.

Seed pods usually contain up to 12 or more seeds. When mature, pods shatter open, scattering seed several feet. Seed is round, greenish brown to black, and slightly smaller than red clover seed. Seed weighs slightly more than 60 pounds per bushel, with a pound containing from 350,000 to 400,000 seeds.

It's often been tagged as a "poor land" legume, since it will produce better than most legumes on poor soils. But Rampton says that although it does tolerate acid or alkaline land, birdsfoot trefoil is most productive on highly fertile, well-drained neutral

soils. Under such favorable conditions, however, such legumes as alfalfa and Ladino clover are also more productive.

The legume is at home near sea level or on Oregon's cultivated mountain lands. It needs at least 16 inches of rain a year to survive, although forage production is low at that moisture figure. Plants tolerate cold and hot weather, but seedlings are easily killed by drought and freezing. Slugs, a common legume pest, haven't been reported as attacking birdsfoot trefoil.

Seed bed preparation important

How to get a good stand of any lotus isn't completely understood. Experimental evidence and farmer experience indicate the following four steps need special attention: 1. seedbed preparation. 2. inoculation. 3. seeding. 4. pasturing and other use.

Here are specific suggestions:

► Seedbed preparation. It's best to fall-plow and leave the soil rough. Then disk, harrow, and pack several times in the spring to kill weeds and to get a fine, firm seedbed. Lotus has low seedling vigor, thus needs favorable seedbed conditions.

► Seed inoculation. Birdsfoot trefoil requires a special bacteria to insure root nodulation and healthy plant growth. If commercial and "home made" inoculants are available, Rampton advises using both. First, apply the commercial inoculant, following the directions on the package. For a "home made" inoculant, take some soil from around a healthy lotus plant. Dry at room temperature and screen until it's powder-fine, and mix $\frac{1}{2}$ pound of soil to 10 pounds of seed. Moisten seeds slightly with skim milk before treating, so that soil will stick better to seed coats.

► Seeding. Roll the finished seedbed with a corrugated roller; then broadcast seed (about six pounds per acre) and roll again. New packer-seeders do this in one operation. Applying 20 to 30 pounds of actual nitrogen per acre at seeding time will speed up seedling growth on most soils. Irrigation generally will help, too.

Plant in the spring—April to early June. With irrigation, summer fallowing and planting as late as September 1 have worked well. Don't seed early

in the spring. Seedlings won't grow much until warm air and soil temperatures encourage growth. Also, heavy spring rains after planting usually crust the soil, preventing seedling emergence. Crusted soil later cracks, causing summer moisture loss.

If using lotus in a pasture mixture, delay planting grasses and other legumes until your birdsfoot trefoil has been established. Grasses usually will hold back lotus seedlings. The Southern Oregon narrowleaf, however, seems to grow well with Ladino clover in Jackson County irrigated pastures. Farmers usually mix $2\frac{1}{2}$ to 3 pounds of each per acre.

► Harvesting or pasturing. Don't try to harvest or pasture birdsfoot trefoil the planting year, unless there's at least 12 inches of top growth. Give your plants a chance to get started.

Lotus produces excellent hay and silage. Livestock like its fine, leafy, soft stems. Douglas County dairymen reportedly prefer it to alfalfa, and will pay a premium for it. It also is preferred because of its reported non-bloating qualities. There never has been a known case of bloat caused by this legume.

Birdsfoot trefoil is different from other legumes in another way. It holds its leaves as it nears maturity, provided there's enough soil moisture for plant growth. Thus, if the weather isn't right you can delay harvesting lotus hay without losing quality. Yields vary from 1 to 3 tons per acre per cutting, depending again on moisture and soil fertility. You can usually take two cuttings on irrigated lands. Although alfalfa often produces more forage, birdsfoot trefoil will live longer—5 to 10 or more years—and will thrive on land that will not produce alfalfa.

Because of the upright growth habit of broadleaf lotus, Rampton recommends a rotational grazing system when pasturing, allowing the crop to come into bloom once each year. Southern Oregon narrowleaf and Empire do not need rotational grazing for survival but will yield more forage under that management.

Harvesting seed difficult

Harvesting lotus seed is difficult. Since it ripens unevenly and shatters,

yields vary from less than 50 pounds to more than 400 pounds per acre, depending on growth conditions, weather at harvest time, harvesting methods, and grower experience.

Some growers have netted high yields on small acreages by cutting the crop when it's ripe, then shocking for curing on paper or canvas to recover shattered seeds. After curing, seed is easily threshed.

Other methods have been reported, too. One is to tie a wilted crop in round bales which are stood on end to cure. After curing, the bales are threshed. It's difficult, however, to unroll bales. Direct combining after killing topgrowth with chemicals is another method, but hasn't found favor in Oregon. Chemical spraying ruins the crop as forage. Recently, direct combining of the green crop has been tried with some success. With this method, the threshed seed is spread out to dry, then rethreshed to claim seed from unopened pods. Forage after combining usually makes excellent hay.

Most seed growers take the first crop as hay, silage, or pasture. Then regrowth matures for seed. Blossom production is usually heavier on the second crop, and weeds and grasses are less a problem. More bees visit lotus fields then, since there's less competition from other crop flowers, and spittle bugs aren't a problem then, although they can cause blossom drop the first cutting.

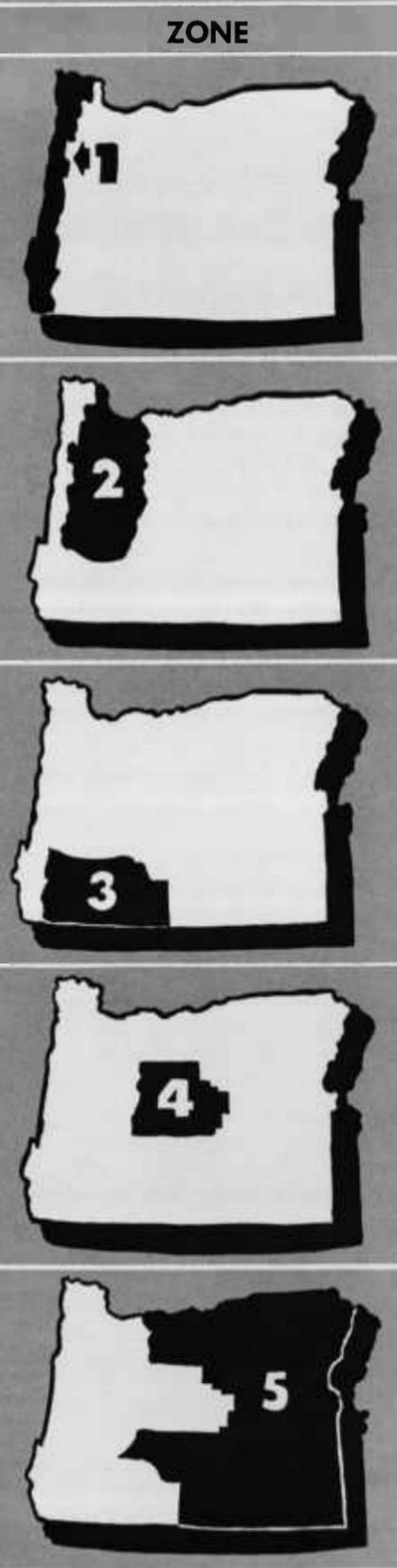
Most seed growers cut a forage crop in late May or early June. This leaves plenty of time for seed crop development. Delaying the first cutting until July often means a production loss, since fall rains may prevent seed-crop harvesting.

About 150 acres will be growing certified Granger birdsfoot trefoil seed in 1954. This is expected to produce at least 15,000 pounds for 1955 plantings. Some 25,000 pounds of Douglas lotus seed will be available this spring. County extension agents know the nearest seed sources in your area. Present supplies aren't enough for Pacific Northwest demand. More is needed. When enough Granger and Douglas lotus seed is available, Rampton thinks these two varieties will replace other broadleaf lotus varieties in Oregon.

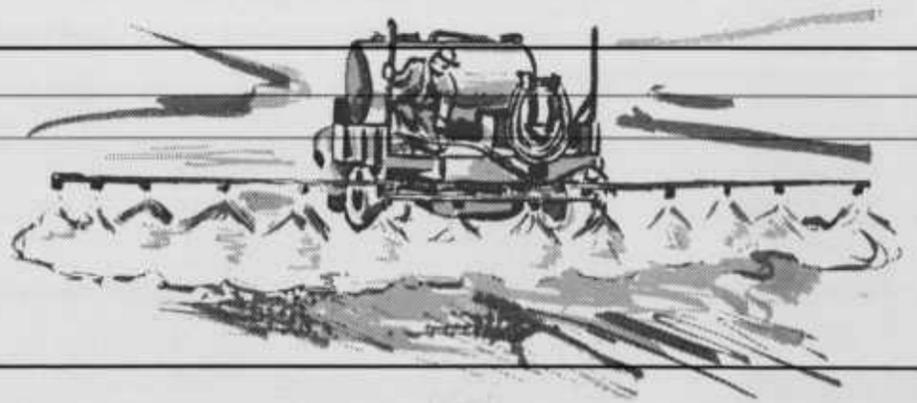


HERE IS YOUR SPRING SPRAY CHART

Compiled by Agronomists Bill Furtick and Roland Laning, these recommendations are based on past and current research findings.



ZONE	WEEDS CONTROLLED	CHEMICALS	RATE PER ACRE	REMARKS
1	Brush	2,4-D, 2,4,5-T	3-4 pounds acid in 100 gallons of water	Spray to wet when in full leaf
	Tussock	2,4-D ester	3-5 pounds acid, 5 gallons diesel oil, emulsifier and water to make 100 gallons	Apply until thoroughly wet; May-June
	Tansy ragwort	2,4-D ester	3 pounds acid in 100 gallons of water	Spray before flower stalks form
2	Broadleaf weeds in small grain	2,4-D or 2,4-D-2,4,5-T	1/2-1 pound amine or LV ester in enough water to cover	Spray after 6" tall but before boot stage
	Canada thistle	2,4-D or MCP	1-1 1/2 pounds acid	Early bud stage
	Weeds in beans and sweet corn	Dinitro amine	3-6 pounds in enough water to cover	3 pounds for sandy soil; 6 pounds for heavier soils. Apply one day before crop emergence.
	Carrots	Carrot or selective oil	60-80 gallons	Apply after carrot has one true leaf and before root is size of lead pencil
	Brush	See Zone 1		
	Tansy ragwort	See Zone 1		
3	Weeds in small grain	See Zone 2		
	Broadleaf weeds in Ladino clover	2,4-D or MCP	3/4 pounds amine in enough water to cover	
	Brush control	See Zone 1		
	Weeds in beans and sweet corn	See Zone 2		Not a complete recommendation, but only on a trial basis
4	Weeds in small grain	See Zone 2		
	Brush	See Zone 1		
	Weeds in beans and sweet corn	See Zone 3		
5	Weeds in small grain	See Zone 2		
	Brush	See Zone 1		
	Weeds in beans and sweet corn	See Zone 3		
	Wild oats in peas	1PC	4 pounds in enough water to cover	Apply ten days before planting and work into soil
	Broadleaf weeds in peas	Dinitro selective	3/4 pounds in enough water to cover	Apply when peas are 3 to 4 inches high when temperature is high.





Lower Winter Feed Costs!

EXPENSIVE winter feeding often takes the profit from cattle raising, especially when feed costs are up and cattle prices are down—like right now.

Feeding isn't as much a problem in other seasons. It's in the winter, when you have to carry cattle through to spring pasture that feeding takes a big chunk of total costs. And cheap or expensive gains will usually separate profit from loss. With feed and cattle prices the way they are now, "guessing" is a poor way to insure profitable cattle gains, so here's a roundup of some cattle feeding research results from OSC and elsewhere, compiled by animal husbandman J. E. Oldfield, which may help in taking much of the guess from successful feeding.

Oregon farmers carry out three main types of winter feeding operations:

▶ **FEEDLOT FINISHING:** Cattle come off grass in the fall with most of their growth, but lacking finish to grade Good or better. Cattle should put on rapid gains—about 2 pounds per day. Rations should produce fat, and should be high in "digestible nutrients," such as those found in grain. Protein is not as important in the fattening ration as it is in the next two. Other feedlot feeding suggestions were reported in the fall issue of "Oregon's Agricultural Progress."

▶ **WINTERING THE BREEDING HERD:** Cows in calf are carried through the

winter to maintain health and vigor, not necessarily to put on weight. If cows are in good flesh in the fall, increasing the weight of the unborn calf may offset some loss in condition of the cow. If cows are thin when they go into the winter, feeding like this won't work. You'll have to feed extra to put some weight on them, too. Pregnant heifers, since they're still growing, should usually gain through the winter. So Oldfield recommends figuring their rations accordingly. Proteins are important for growth—whether for the unborn calf, the growing heifer, or the thin cows in calf. You'll need to emphasize proteins.

▶ **WINTERING CALVES:** Calves in winter are fed for growth, but not necessarily for fat. Calves usually can gain cheaply by feeding on spring grass. There's been a lot of guessing on the best level for feeding winter calves or yearlings. Oldfield says early studies at the Eastern Oregon Livestock Branch Experiment Station at Union indicate that high level winter feeding was neither necessary nor desirable. Studies showed that animals which were fed primarily for slight gains in winter outgained others which had been fed heavily when the two lots were turned out on grass the following spring. This does not mean calves should be "starved into gaining." It means feeding just enough for growth—enough to gain $\frac{3}{4}$ to 1 pound a day.

When figuring winter rations, Oldfield recommends considering four points:

▶ Nutritional requirements outlined above.

▶ Available feeding material. This usually is built around hay and silage.

▶ Price of purchased feeds. Often cheap feeds won't bring cheap gains. You'll need to consider nutritional value, as well as substitutes that will give you a balanced ration.

▶ Acceptance of feed by cattle. No ration—no matter how expensive—is good if livestock won't eat it. This is especially important when feeding synthetic byproducts or other unnatural feeds.

"Total Digestible Nutrients" important

The animal can't use every scrap of its feed for building tissue. Much is eliminated, therefore wasted. This makes it important that in its ration there's enough of what the animal needs. Animal nutritionists call these useful parts of an animal's ration "Total Digestible Nutrients" (TDN). Each stalk of hay, each kernel of grain, contains some TDN, plus a lot of nonusable extras.

What's included in TDN? Officially, it's digestible crude protein, fat, digestible nitrogen-free extract, digestible parts of fiber, vitamins, and minerals. Many of these items are adequately supplied in the usual hay-grain combination. But extra feeding of one important item is often necessary. The

Several methods of feeding your cattle enough proteins this winter are suggested. This is the second of four cattle feeding articles by researchers and specialists at OSC.

item: protein. And careful protein feed buying is one place where you can save money.

Roughages grown in Oregon often don't contain enough protein for winter feeding. Grass hay, for example, and straw from the grass seed industry are low in this important product. Analysis by OSC's agricultural chemists shows that many dried grasses contain less than 5 per cent crude protein. At least 8 per cent is recommended. Supplementing low-protein forages thus becomes an important problem.

Proteins may be added in many ways. And Oldfield says it's important to compare them carefully, since proteins probably are the most costly nutrient you'll have to buy. Several on the market include oil meals and cakes, field peas, and high-protein hay.

Many cattlemen feed small amounts of high-protein meal such as cottonseed, linseed, or soybean oil meals (at 1 pound per head daily) as a supplement to grass hay or straw. Better cattlemen buy them on pounds of actual protein they supply. For example, 40 per cent protein cottonseed meal at \$90 a ton would supply actual protein cheaper than 33 per cent protein linseed meal at \$80 a ton.

Livestock like oil meals

Livestock like oil meals, and it may be a problem of feeding them so all animals get their fair share. Recent experiments in Oklahoma and Wash-

ington have helped solve the problem. Researchers found that you can self-feed protein concentrates by mixing the daily amount with 20 to 40 per cent coarse ground stock salt. High salt consumption tends to limit protein feeding to the desired level.

Austrian field peas practical

A practical protein supplement among Oregon feeders may be Austrian field peas, since prices the past few years have favored this home-grown protein. Peas aren't as high in protein as are the oil meals—they usually test around 20 per cent digestible protein. But they are one of the few high-protein feeds grown in Oregon, and cracked peas have been fed successfully in both fattening and growing rations at the Union station. Generally, they've been fed in combination with other grains and make up about one-fifth the total mixture. Cattle like cracked peas, and Oldfield thinks it's probable that if you're feeding only a pound or two of grain, peas might make up more than one-fifth of the total mix.

Alfalfa, clover, and other legume hays are naturally rich in protein. If full-fed, additional protein supplements are seldom needed. Grass and peavine silages also are high in natural

protein. These materials are often used to supplement coarse grass, hay, or straw. Such feeds are also good sources of vitamin A—needed by cows in late pregnancy.

Besides directly providing essential nutrients to a ration, protein supplements have another important advantage—added to low-quality hays, they increase the palatability of the whole ration.

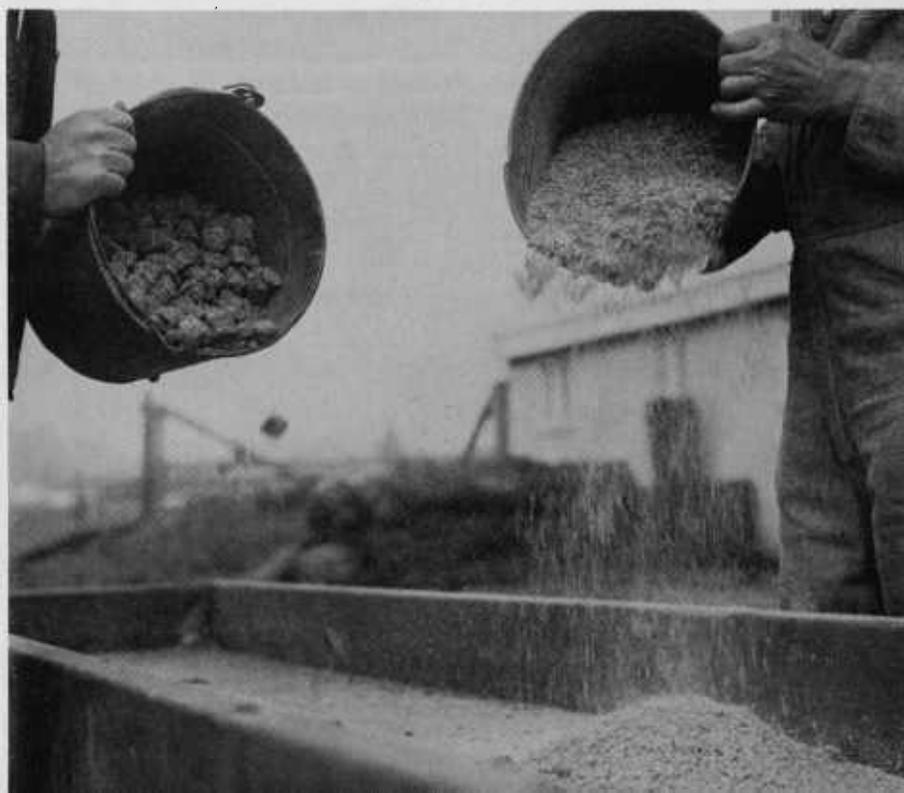
Research at the Squaw Butte-Harney branch station near Burns has shown that wintering animals will eat more low quality hay if it's supplemented with small amounts of oil meal. This means you might increase intake of low-protein, low quality feeds by raising their palatability with small amounts of high protein concentrates, and save by feeding little high cost protein. Animals would then receive the needed nutrients by eating more low quality roughage.

Synthetic protein supplements

Since World War II, there's been considerable interest in synthetic or "artificial" protein supplements. These work because bacteria and other microorganisms in a cow's rumen can take ammonia or urea and build proteins. These micro-organisms are digested

(Continued next page)

None of the finer—and more valuable—ingredients will blow out of these pelleted feeds being dumped at left. Note finer materials are sifting out at right. With pelleted feeds, cattle get right mix.



(Continued from page 13)

after they pass from the rumen to the true stomach, and the animal uses the manufactured proteins to build body tissue.

But Oldfield says "manufactured" protein-nitrogen compounds have little energy value. That means you must feed some energy-rich feed, such as grain, with them.

A modification of the widely publicized "Purdue supplement A"—which contains urea—includes adding enough corn as an energy feed so that urea, as a protein supplement, will work when fed with low quality roughage such as corncobs or grain or grass straw.

It's difficult to say whether natural protein feeds or nonprotein-nitrogen chemicals are the cheapest protein source for winter supplemental feeding. Oldfield thinks that natural proteins usually supply other needed "extras" such as phosphorus and vitamin A. When home-grown or locally cheap protein supplements are available, they will be hard to beat for putting on cheap gains.

Vitamin A, phosphorus important

Proteins aren't the only nutrients that may be lacking in a winter ration. Home grown hays often may be low sources of vitamin A, phosphorus, and other essentials.

You can usually tell whether hay or silage will supply any vitamin A by its "greenness." The vitamin is destroyed when exposed to the air, and stacks of loose hay stored more than a year usually are poor sources of vitamin A.

Range operators must carry over some hay from one year to another. So for better nutrition, Oldfield recommends feeding carry-over hay in the fall, then feed newer, greener hay in the months just before calving—when vitamin A is needed most.

Phosphorus is an essential element that may become deficient in winter feeding, especially when you're feeding low quality roughage with little or no grain or oil meal. Animals lacking this element usually chew old bones, and they'll eat steamed bone meal if it's offered. In fact, steamed bone meal, fed free choice is the recommended method of making up phosphorus deficiencies. If fed free choice, animals will usually eat enough to balance their own ration.

Something new in cattle feeding is pelleted feed. Although cubing is an extra processing step, Oldfield says pelleted feeds have certain advantages which may outweigh extra costs. When a balanced feed is put in pelleted form, animals will get the right mixture. Finer—and usually the most valuable—ingredients won't sift out. Pellets also are practical when you're feeding in windy areas. OSC experiment station research shows you can

get good gains by using pelleted feeds.

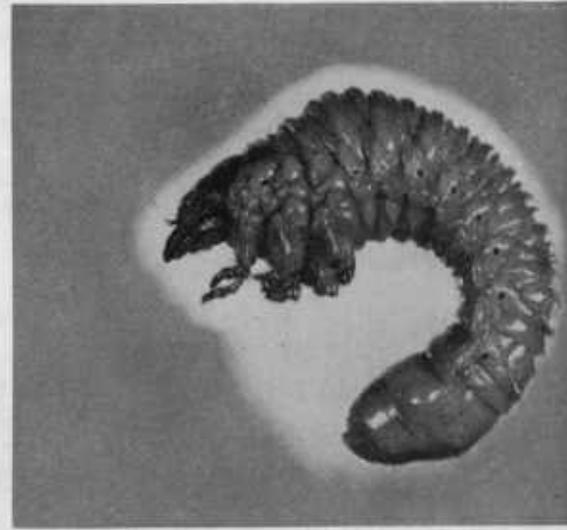
Successful winter feeding means using as much home-grown feeds as possible. But Oldfield recommends purchasing supplemental feeds to carry your cattle to the needed nutrition level. This is true for feedlot finishing, wintering a breeding herd, or wintering calves. Listed below are some suggested winter feeding rations, based on the nutritional needs outlined above, plus today's "best buys."

Here are some suggested winter feeding rations. Oldfield says they aren't the best possible, since they cite only three of the hundreds of possible feeding combinations in Oregon. Also, the amounts recommended are averages. That is, feed smaller amounts at the start of a feeding period, then increase as animals get larger. Total feed per animal includes TDN, digestible protein, phosphorus.

Type of Production	Total Feed Per Animal	Total Feed per Animal includes—		
		Total Digestible Nutrients	Digestible Protein	Phosphorus (453.5 g = 1 lb)
	Pounds	Pounds	Pounds	Grams
Winter Fattening of Yearling Cattle in Feedlot				
<i>(Expected daily gain: 2.2 pounds)</i>				
Suggested Daily Ration:				
Alfalfa-Grass Hay	15	6.72	1.02	14.07
Barley	8	6.26	.62	14.88
Field Peas	2	1.56	.40	4.54
Total Supplied	25	14.54	2.04	33.49
Recommended Daily Allowance	18-27	11.5-17.5	1.3-1.7	17.20
Wintering Pregnant Cows, Initial Weight 900 Pounds				
<i>(Expected daily gain: 1 pound)</i>				
Suggested Daily Ration:				
Grass Straw	15	6.00	0.61	6.84
Alfalfa Hay	5	2.51	0.53	5.45
Cane Molasses	2	1.48	0.72
Steamed Bone Meal	0.06	3.78
Total Supplied	22.06	9.99	1.14	16.79
Recommended Daily Allowance	20	10.00	0.90	16.00
Wintering Calves, Initial Weight 400 Pounds				
<i>(Expected daily gain: 1 pound)</i>				
Suggested Daily Ration:				
Mixed Grass Hay	10	5.17	0.35	9.50
Barley	1	0.78	0.08	1.86
Soybean Meal	1	0.79	0.36	2.77
Total Supplied	12	6.74	0.79	14.13
Recommended Daily Allowance	11	6.00	0.70	12.00

Rain beetles:

**for years
adults were a collector's item.
grubs now found
to girdle apple tree roots.**



ARARE, once-thought harmless beetle—sought by scientists because it has remained virtually unchanged since prehistoric time—has emerged as a killer of apple trees in the Hood River Valley.

Finding that the rain beetle *Plecoma minor* has been the cause of vigor loss in apple trees has partially solved the mysterious decline of apple production in parts of the area.

David McKeown, Odell grower, and Vernon Olney, OSC research entomologist at the Mid-Columbia branch station, found that beetle grubs were limiting apple production by girdling tree roots. Production from some of McKeown's trees had been cut 80 per cent. Trees that should yield 20 to 25 boxes produced only 3 to 8 boxes. Also, affected trees were low in vigor, thin in foliage.

Gouged roots tell more of the story. It is amazing that trees survive, say the entomologists. In severe cases, most of the root surface and trunk underground has been completely scoured by the voracious grub's strong mouth parts. Olney has found from two to four grubs per square foot around tree roots. This means that from 1,000 to 2,500 grubs were feeding on roots of a single tree!

So far, grubs have attacked Newtowns and a few Delicious. Pears seem almost immune. Damage has been found in at least 23 orchards.

Beetle was a collector's item

Up to now, beetles of this group have been a collector's item. They're

found only on mountain slopes in the three Pacific Coast states, lower California, British Columbia, and Alaska. Scientists figure that they existed in the Miocene age (about 28 million years ago) when the Cascade range was the Oregon coast line. Weather was semi-tropical then, with the balmy period continuing through the Pliocene age (about 12 million years ago) and until the ice age began about a million years ago.

The Cascades were just emerging in the Miocene age, and continued building up in the Pliocene age. Insects are believed to have lived atop isolated mountain slopes. If you map the area where the insects have been found in California, place that map atop another showing the land area during the Pliocene age, you'll note a striking similarity between present beetle occurrence and exposed land masses of that age.

Since the beetles can stand both cold and hot weather, invading glacial sheets of the ice age didn't kill them.

At present, rain beetles have rarely been found far from mountain slopes. Why? The answer lies in their unusual life and reproductive cycle.

Females cannot fly

According to OSC entomologist P. O. Ritcher, the female can't fly and she rarely leaves her dirt burrow. In November, OSC researchers have observed male rain beetles flying about in the early morning darkness. Females open their burrows, probably spread a scent to attract flying males, and

settle in their burrows to await a visiting male.

After mating, the female digs deeper—13 to 17 inches—lays her eggs the following summer, then dies. Each female usually produces 20 to 25 larvae.

Adults are oval and slightly over an inch long. Males are hairy and have wings, with wing covers a darker brown than the rest of their brown body. Females are tan. Grubs look like any other white grub. When full grown, they are almost the size of a man's index finger, somewhat U-shaped, creamy white with tan heads.

Grubs have been found to reach several distinct sizes, indicating this part of their life cycle takes several years. In this stage, they gnaw on apple roots.

The entomologists don't know when grubs pupate—the next step before emerging as adults. They think it's before September 15, since adults have been dug up after that date.

In the fall—just before heavy rains—new adults begin burrowing toward the surface. In November, the mating cycle begins.

The fact that females can't fly is the reason why beetles rarely wander from their birthplace. Only grubs can be expected to move. And they do not move far. Also, the fact that females are close to the soil surface at mating time offers a possible control. Rotocultivating at the time of fall beetle flights should kill most female beetles—and McKeown is trying it this year in his orchard.



Livestock

Cure Sheep Pinkeye With New Antibiotic

One of the new antibiotics—chloromycetin—looks like a quick cure for sheep pinkeye, according to OSC veterinarian J. N. Shaw.

Used as a one per cent ointment, he has found that it often will clear up pinkeye with one application.

Sheep pinkeye usually occurs before or during lambing. Sheepmen often first note it when infected sheep can't find their way to a feed shed. The eyeball is covered with a thick, white scum, which later turns red. If left untreated, ulcers form and the eyeball ruptures, causing blindness. Other symptoms are matted wool below the eyes, reddened eyelids, and some loss of condition, since the sheep can't see.

Dr. Shaw reports that chloromycetin ointment is put up in $\frac{1}{8}$ -ounce tubes. This is enough for treating 20 head. Tubes are sold by prescription and cost about one dollar.

In past years, sheep pinkeye was treated with 15 per cent solution of fresh argyrol, but some cases were hard to cure.

Dr. Shaw reports that workers in England have found that cured sheep often become carriers—spreading the infection to healthy sheep. They have found that the organism causing the disease will remain in sheep as long as 20 months after symptoms have disappeared.

The organism causing sheep pinkeye is different from the one causing pink-eye in cattle and other animals. But Dr. Shaw adds that chloromycetin holds promise for clearing up pink-eye in cattle in some cases.

Silage Can Replace Hay In Fat Lamb Ration

GRASS silage can replace dry alfalfa hay as the roughage in a fat lamb ration, if supplemental dry feed, or grain, is fed with it, according to animal husbandmen E. E. Hardie, J. B. Johnson, and J. E. Oldfield.

The researchers fed three rations 18 weeks to equal groups of lambs. The ration fed daily to each lamb in one group contained 0.6 pounds oats, 0.6 pounds barley, and 1.5 pounds alfalfa hay. A ration fed to the second group had the same amount of grain plus 3.6 pounds grass silage. The third group of lambs received only $6\frac{1}{2}$ pounds grass silage daily. This equaled the dry matter of the other two rations.

These daily amounts were increased as lambs' appetites increased, but rations were always in proportion, so the dry matter intake of the three groups was the same.

Lambs fed the first two rations gained about one-third pound a day, while those fed silage alone gained less than one-tenth pound per day.

Half the lambs fed the first and second rations graded prime, the other half choice. Fifty-seven per cent fed only grass silage graded choice, 43 per cent graded good.

The researchers suggest two reasons why lambs fed only silage gained slower and finished lower:

1. Grass silage contained about two-thirds moisture, and lambs eating it would have to take in almost one and a half times the amount of feed they would normally eat to get the same amount of dry matter in the alfalfa-grain ration. Lambs on grass silage alone repeatedly refused some silage, indicating the high amounts needed to equal alfalfa hay limited intake.

2. Lambs fed silage ate a high amount of water in their feed, and re-

"Infertile" Cows Found Pregnant

Guessing that a dairy cow is infertile doesn't always mean she is.

In fact, a survey of dairy cows sold for slaughter because they were thought infertile revealed that one-third were pregnant, and a sixth had no diseases or abnormalities that would prevent them from becoming pregnant.

In other words, about half the cows were needlessly slaughtered—they were fertile.

That's one finding of an infertility study of dairy cows conducted by OSC veterinarian J. F. Bone.

Dr. Bone also checked the ovaries and reproductive tract of OSC dairy cows slaughtered for infertility reasons the same time he was surveying animals at Willamette Valley slaughter houses. College herds are routinely examined by veterinarians. Only 13 per cent of those slaughtered were potentially fertile.

Loss in production, in blood lines, and in money from "guessing wrong" would have more than repaid veterinarian costs, says Dr. Bone.

searchers think that much of their energy was used to raise this water to body temperature.

Lambs like these gained more when fed grain with grass silage. Lambs fed only silage gained less, finished lower. Grass silage was found a good replacement of alfalfa hay in a fat-lamb ration.



Provide 1 Square Foot If Floor-Brooding Poult

Provide 1 square foot of floor space per bird when floor brooding turkey poults the first 8 weeks, advises poultryman J. A. Harper. With wire floor brooding, $\frac{3}{4}$ square foot per bird will give good results, if you use forced hot air heat.

Three year's research comparing different brood room floor spacing and heating methods has shown that the above figure will result in faster and cheaper growth rates, higher livability, quicker feathering, and lower brooding costs.

Harper tested 1, $\frac{3}{4}$, and $\frac{1}{2}$ square foot floor spacings, comparing them with different heating methods, including electric hovers, infra-red heat lamps, electric radiant heating, hot-water radiant heating, and forced hot air.

For solid floor brooders, type of heat did not affect growth rate, livability, feathering, or brooding costs. Only floor space affected growth rate, etc.

Some of Harper's floor space figures: After 8 weeks of brooding with 1 square foot per bird, he reports poults gained 3.6 pounds. Three-fourths square foot per bird, 3.4 pounds; $\frac{1}{2}$ square foot, 3.2 pounds.



Can Replace Some Grain With Molasses

Replacing $7\frac{1}{2}$ per cent of the grain with wood sugar molasses will bring an increase in egg production, according to tests by poultrymen W. T. Cooney and J. E. Parker.

The poultrymen used molasses prepared from wood waste—a by-product of the Douglas-fir lumber industry—in three years of testing. As yet, the material isn't commercially available, but may be sold in the future if cheaper production methods are found. But the results are practical to Oregon poultrymen for another reason: this work would indicate that you can safely replace $7\frac{1}{2}$ per cent of the grain with cane or beet molasses if the price is favorable. The product tested contained 50 per cent water—and molasses you might buy probably will contain that much water.

In one trial, the molasses was mixed

with the mash and made up 4.4 per cent of the total ration. After 11 months of feeding, the molasses-fed birds averaged a 7 per cent increase (or 23 eggs) in egg production over those not fed molasses.

Those fed the molasses ration ate more, too, but their higher egg production offset any higher feed consumption. It took molasses-fed birds 4.9 pounds of feed to produce one dozen eggs, compared to 5 pounds of feed for birds not fed any molasses.

The poultrymen also report no difference in livability, hatchability, nor in wet litter between the two groups. The molasses resulted in a slight laxative effect at first, but it soon left.

Cooney and Parker also tested wood molasses as 15 per cent replacement of grain, but it failed to increase egg production and caused stickier litter.

Box, Mechanical, or Trough Feeders? Broilers Will Gain About as Fast with Any One —

Type of broiler feeder doesn't greatly affect how fast or how much your broilers will gain—as long as you provide proper feeding space.

After testing four types of feeders for ten weeks, poultryman Larry Johnson says broilers feeding from each type gained about the same.

He tested the chain type mechanical feeder, large box feeder (1 square foot per 10 birds), small box feeder (1 square foot per 20 birds), and the usual trough feeder. Both the mechanical and trough feeders were adjusted so that each chick would have 1 inch feed space the first 2 weeks, 1 to $1\frac{1}{2}$ inches the next 2 weeks, and 3 inches the last 6 weeks. Two hundred forty chicks from the same New Hampshire strain were used to test each feeder.

It took about 2.75 pounds of feed to put on a pound of gain. Each broiler averaged 3.03 pounds at the end of

10 weeks, regardless of type of feeder.

Chicks mechanically fed gained 3.18 pounds; large box fed, 2.88 pounds; small box fed, 3.06 pounds; and trough fed, 3.01 pounds.

When deciding which type of feeder to use, Johnson recommends considering original cost, labor saving, and ease of management. Mechanical feeders cost more, but cut labor costs. Box feeders are easy to build and require less labor than the usual trough feeder. Gains from small box feeders, however, dropped the last two weeks of feeding, indicating more space was needed. Also, more litter and droppings accumulated in the large box feeder, probably because more chicks crowded into the box at night. More droppings meant a dilution of feed. So, box feeders may prove difficult if poultrymen allow too little or too much space per chick, says Johnson.



Feed in this small box feeder remained clean throughout a 10-week feeding trial. Gains, however, dropped off last two weeks of feeding indicating more space was needed. But type of broiler feeder did not greatly affect total gains.



Orchard & Garden

Increase Blackberry Size With Growth Regulating Spray

Two distant relatives of the weed killer 2,4-D will increase evergreen blackberry size if sprayed at the right time and at the right strength, and if there is adequate soil moisture.

Horticulturists Quentin Zielinski and Ralph Garren report that they have increased yields 10 to 15 per cent. Active ingredients—listed on labels—are both beta-naphthoxyacetic acid and para-chlorophenoxyacetic acid. The material is sold under several brand names.

It is sold in easy-to-mix liquids which contain a spreading agent.

After three years testing and two years of tryout on commercial berry fields, the two researchers say it's important to apply the first spray 14 days after full bloom or when fruits from the first blossoms are about one-third grown. Apply the mixture again 7 to 10 days later. Use spray equipment that will give you 50 to 100 pounds pressure, but the horticulturists recommend not using sprayers that are regularly used for applying 2,4-D or 2,4,5-T.

There is some evidence that the growth regulators will not be as effective

if there is a lack of soil moisture.

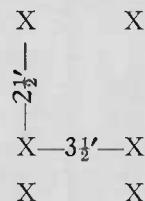
Don't expect yield or berry size increases the first picking after spraying. According to the researchers, the effects of spraying will show up the third picking. A Marion County berry grower—Pete Taranoff of Salem—reports highest increases the last three pickings after spraying the first of the season.

How about cost? Zielinski and Garren estimate chemical and application costs may be less than \$5 an acre—rarely above that figure. A 10 or 15 per cent increase in yields means a large return on a small investment. Figuring if a field normally yields 6 tons per acre, a 10 per cent increase would mean 1,200 pounds. At 10 cents a pound, the increased yield would bring in \$120—compared to \$5 for cost of buying and applying materials!

If you want to experiment with growth-increasing chemicals, the workers recommend spraying only a few vines or rows the first year, leaving unsprayed plants for comparison. They figure this is a safe way to find if the growth regulators will work under your growing conditions.

Proper Row Spacing Ups Berry Yields

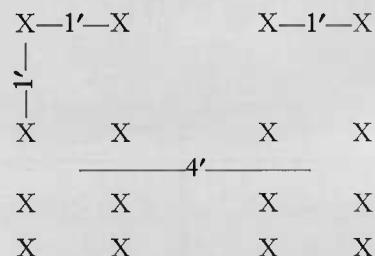
A California system of spacing strawberry plants for increased yields looks promising for Oregon growers. Most Oregon strawberries are grown in wide rows, with runners matting within rows:



When thick mattings begin to decrease yields, most growers reduce row width to insure better yields.

But U. S. Department of Agriculture horticulturist George Waldo reports that you probably can get a 40-per cent yield increase just by spacing plants at planting time in narrow rows, then clipping all runners.

In a two year test, Waldo used the following spacing:



The spaced plantings yielded an average 13,391 pounds of berries per acre per year for the two years. Matted row spacings averaged 9,294 pounds an acre each year. The yield increase was much greater the first season than in the second.

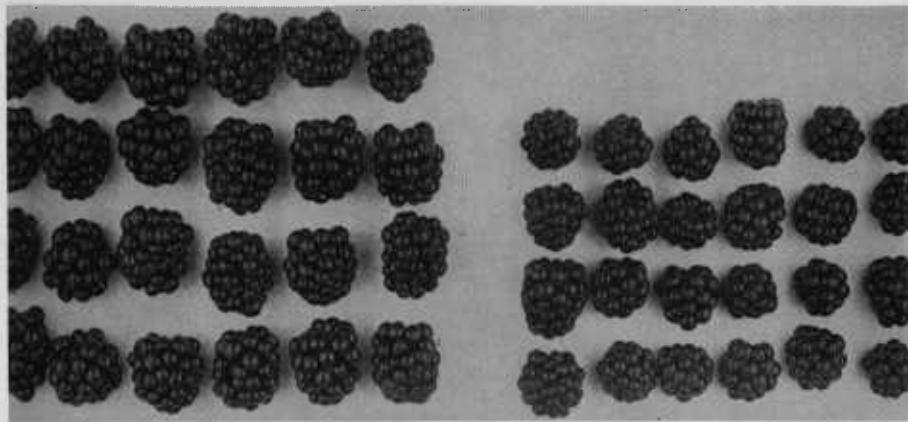
There also was a difference in berry size. First year berries were larger on spaced rows. But they were larger in matted rows the second year. The horticulturist says this is because matted row plants were smaller the first year, larger the second.

Use space better

Reason for the increased yield, according to Waldo, is better use of space. You can get larger yields by filling up an area with as many well

(Continued next page)

Growth regulators applied at the right time resulted in this increase in berry size. Berries left were sprayed, those at right, unsprayed. Spray materials, sold under brand names, are relatives of 2,4-D.



New Way to Kill Corn, Bean Weeds

Killing annual weeds before they break through the soil looks promising for snap bean and sweet corn growers.

OSC agronomist Roland Laning reports that a "pre-emergence" spray of dinitro amine will effectively kill broadleaf weeds and won't reduce crop yields—if correctly applied. It's sold under several brand names.

The chemical is in a family of "dinitro" compounds that have been used successfully as wood preservatives, as selective weed killers in grain and peas, and in oil sprays to increase plant kill.

Research at OSC indicates that 3 pounds of the amine salt per acre is the rate to use on sandy soil for controlling weeds that might emerge in or between crop rows. Up to six pounds is recommended for spraying on heavy soils. If spraying directly only over the plant row, cut spraying rates about two-thirds.

Spray smooth seedbed

Mix the chemical in enough water for adequate coverage—usually 20 to 50 gallons per acre. Spraying a slightly moist, smooth seedbed will insure a better weed kill.

Laning recommends spraying bush beans about 2 days before they break through the soil. You can delay spraying sweet corn until plants begin to emerge. Any small weeds breaking through the surface at spraying time will be killed.

The researcher says the dinitro material keeps weeds from emerging for 3 or 4 weeks, depending on soil moisture and temperature. If cultivating, don't throw soil into the row. This may put weed seeds where they'll germinate.

The weed killer has been tested only on sweet corn and snap beans, and Laning cautions against trying it on other vegetable crops.

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developed plants as will use the available soil moisture and fertility. In most cases in Oregon, this means spaced plantings. There must be enough soil moisture during the dry summer months. This usually means irrigation.

Paper Mulch Found to Triple Melon Yields

Want earlier muskmelons that will yield more than they have in past years?

Then try a paper mulch.

That's the recommendation OSC horticulturist W. A. Frazier has for western Oregon melon growers.

After 3 years of testing different paper mulches, he reports one kind has more than tripled melon yields on experimental plots near Corvallis. They are 36-inch wide strips of Flintkote pineapple paper laid over melon hills. Rectangular slits—2 by 4 inches—are cut in the paper above hills so seeds can be planted and vines grown.

Weather unfavorable

Weather favors melon production in eastern and southern Oregon, but wet springs and dry cool summers have caused harvesting delays and lower yields in western Oregon. It would be several years before a breeding program would result in a variety adapted to western Oregon weather, so Frazier tested paper mulches as a stop-gap substitute.

Paper mulches are used in Hawaii for conserving water in low rainfall pineapple areas. They also keep down weeds and warm up the soil. So Frazier reasoned they might work for western Oregon muskmelon growers.

He also tested mulches with and without plastic "hothouse caps." Untreated plots averaged only 5.6 tons for three years; plots with plastic caps, 9.3 tons; mulch paper, no caps, 19.5 tons; and mulch paper with caps, 21 tons.

Mulch paper brings best yields

Highest increases were from mulch paper without plastic caps, and Frazier says this process should work in many western Oregon melon patches. Use other types of paper with caution. Some contain plant-injuring materials. A 600-foot roll of Flintkote paper costs about a cent a foot, and may be worth it to the melon enthusiast. County extension agents have the address of the Los Angeles, California, firm manufacturing the paper.

Besides increasing yields, fruit from paper mulch-treated plots was harvested a week to 10 days earlier.

Before laying the paper, Frazier

banded from 500 to 600 pounds per acre of 10-16-8 fertilizer one inch to the side and three inches deeper than the seed at planting time. Plantings were watered every two weeks.

Weeds were kept under control in all plots, but the horticulturist noticed that the area under paper mulches wasn't as much a weed problem. Few were able to break through the paper.

Melon quality not improved

The paper didn't improve melon quality. Sugar analysis and taste tests indicated no difference between mulched melons and those from other plots.

Why the increased yield from mulched melons? Frazier isn't sure. His best guess is that higher temperatures and better moisture control under the paper are important.

Control Scab on Glads With Corm Treating Mix

A corm-treating mixture of an insecticide and a fungicide promises a better control of bacterial scab on gladiolus, according to plant pathologist Roy Young.

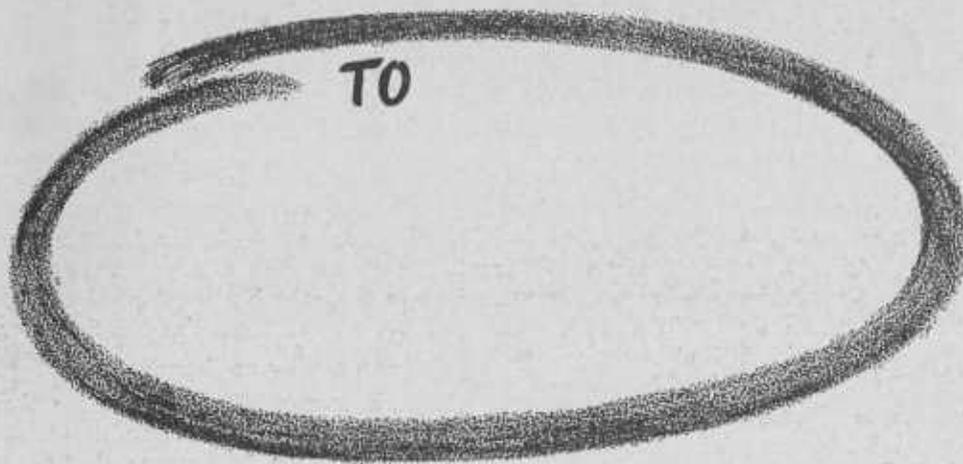
The scab is common on glads. It does not limit corm yields, but the lesions are unsightly, thus limiting sales.

Plant pathologists don't know all the ways the scab is spread. Scab-free corms may produce scabby corms in one area, while scabby corms will yield scab-free corms in another area.

Soil type has little effect, but scabby corms are often found in soils infested with wireworms. Since such insects might wound corm surfaces—providing a disease entry—Young tested an insecticide-fungicide mix along with the usual fungicides.

Here's what he found:

Two pounds of either aldrin or heptachlor in 100 gallons of water mixed with 2 pounds of new improved cersan in 100 gallons of water gave best control. Sixty per cent of all treated corms were scab-free, compared with only 25 per cent scab-free in untreated plots. More than half the corms treated only with new improved cersan were infected.



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Experiment Station Releases New Prune Variety

TREES of Milton Early Italian—a new prune variety released by the OSC experiment station—are available at a number of Oregon nurseries. County extension agents can give you a list of nurserymen selling the new variety.

Milton promises to become a favorite among prune growers for three reasons, according to horticulturist Quentin Zielinski and plant pathologist J. A. Milbrath: (1) Fruit ripens 10 to 14 days earlier; (2) Milton is free from viruses that attack other Italian prune varieties; and (3) it is apparently winter-hardy.

The variety looks like any other Italian prune—both in fruit and in tree. The fruit is medium to large and purple-black; it is similar to other Italians in shape, flavor, texture, firmness, and in processing and shipping quality. Twelve to 14 prunes weigh a pound. Nurserymen propagating this selection have reported good stands of buds.

Trees are vigorous, productive, and hardy. They were not injured by sub-zero weather of the past few winters. So far, the researchers haven't noticed any weaknesses in the variety, but some may appear as Milton Early Italian gets older. It has been on test since 1943.

Milton is expected to fill a need of growers who want a virus and winter-hardy, early prune. Italian prunes make up 85 per cent of Oregon's prune acreage, but late ripening and winter and virus injury has limited production.

The variety has been tested in the Milton-Freewater area and in the Willamette Valley. The researchers do not know if it will grow well in other areas.

Propagating buds were originally collected by the late S. M. Zeller, OSC plant pathologist, from a tree growing on plots at the horticulture experimental farm at Wenatchee, Washington.

Your Farm Program . . .

(Continued from page 5)

contribute to the stability of agricultural prices and income.

Agricultural production should be encouraged to adjust upward and downward in line with changing domestic and world demand conditions. A farm program that does not permit this ready adjustment may contribute to a greater instability within agriculture.

A BASIC conflict in the development of farm programs is whether or not the legislation should give greater emphasis to present problems or to

what is in the best interest of all farmers in the long run. Individuals are confronted with this same decision of balancing present objectives with future objectives. The purchase of a TV set, for example, may provide present enjoyment at the sacrifice of a long-run financial program that includes a new home, retirement income, or other future benefits.

There is no easy answer to the present farm problem. Our problem, whether we like to face it or not, is that we are producing more food and fiber from our farms than can be sold at prices that are satisfactory to farmers. The adjustments necessary to

bring this supply-and-demand relationship into balance are not easy to make. It sometimes seems easier to postpone the adjustment, hoping that something will happen to dissolve the burden of abundant or surplus supplies.

The challenge ahead to farm people is to think through the problems that confront agriculture. It has been through the democratic process and an understanding of basic issues that our present farm legislation has developed to its present level of effectiveness. Through our democratic process, farm people can contribute much to the legislative improvement in the years ahead.