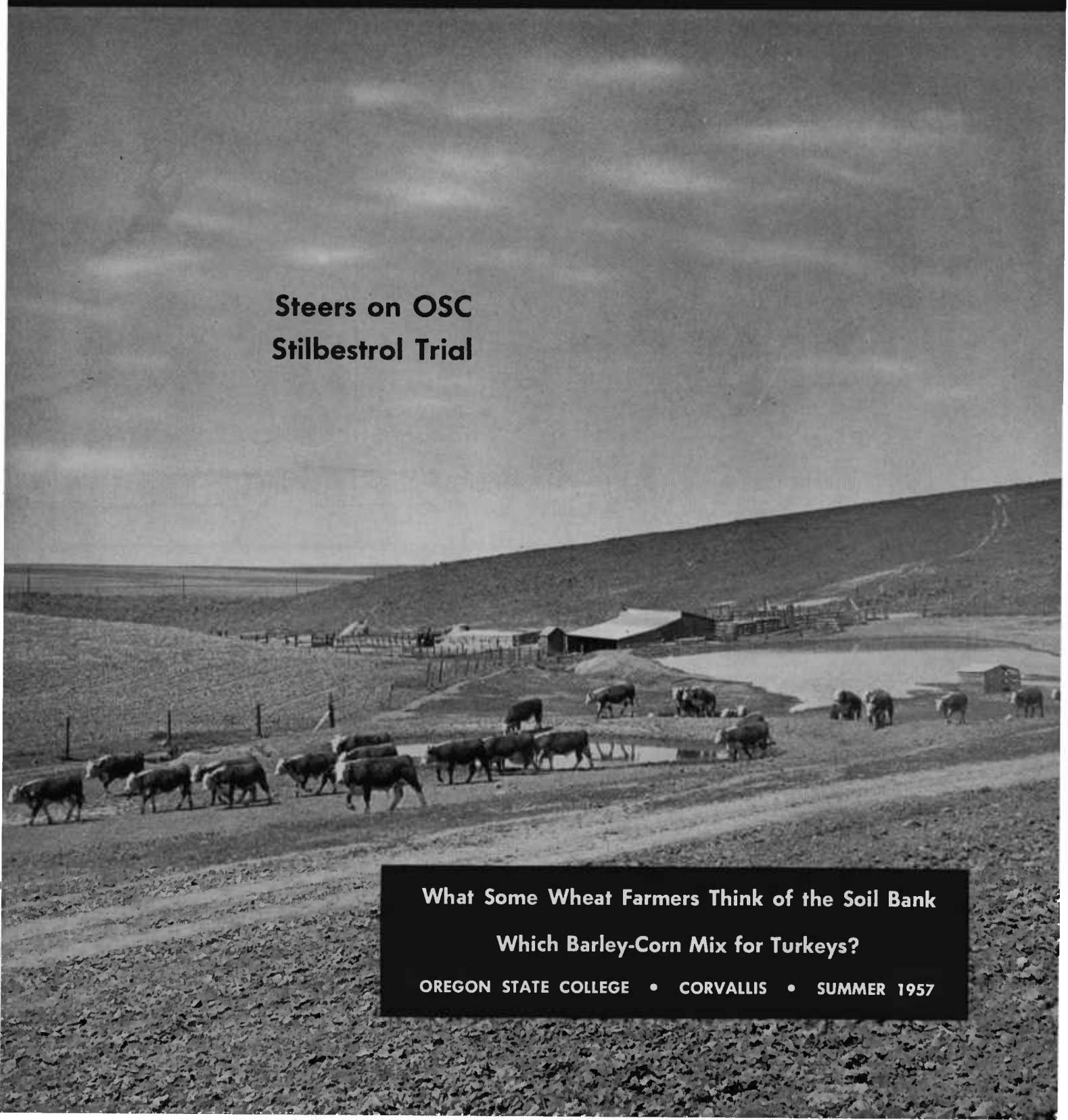
Oregon's Agricultural PROGRESS



Steers on OSC
Stilbestrol Trial

What Some Wheat Farmers Think of the Soil Bank

Which Barley-Corn Mix for Turkeys?

OREGON STATE COLLEGE • CORVALLIS • SUMMER 1957

Oregon's Agricultural PROGRESS

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COVER STORY: Stilbestrol cattle feeding trials are under way with ranchers cooperating with the Experiment Station and County Extension Agents. Cattle on test at the Frank McClintock ranch west of Condon are pictured. Test results of current trials are summarized on page 4.

ECONOMIC FORCES at work on and off farms point toward large supplies and strong demand for most goods and services through the summer and fall.

Off farm, the economy should continue expanding, although probably not as rapidly as in the two previous years. So far in 1957, we have had a slowdown rather than a let-down. Most measures of demand, business activity, and the like, are above a year ago. Yet, they have not increased as much as in 1955 and 1956.

One of the strong points in the national economy has been the 5 per cent rise in consumer income and spending during the past year. Employment has continued at a high level. Factory wage rates are up a dime from a year ago and now average better than $2 an hour. The weekly pay check has not increased quite as fast as the hourly wage due to a little less overtime and a shorter work week.

Many consumers are still borrowing to buy, but consumer debt is not increasing like it was. Business men have also increased their borrowings some and plan record investments in new plants and equipment during the next three months. Likewise, government spending at local and national levels is touching a new peace-time high. All of this is keeping demand strong.

On the supply side, industrial production is down a bit from last December but is still above last spring. Inventories are now being cut a little after building up for nearly three years. Manufacturer's new orders are

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The next issues of *Oregon's Agricultural Progress* are scheduled for January and July of 1958.

Egg prices higher . . . Feeder cattle prices looking better than last year's . . . Contract cattle feeding possible way out for big hay crop.

Farm Outlook

By Agricultural Economist M. D. Thomas

holding about even with last year while food and department store sales are larger. Even new construction is holding up despite the lag in housing starts that has hurt Oregon's lumber business.

Spending for food has been up about 5 per cent in line with the increase in consumer income. About half the increase went to cover higher marketing charges. This left the other half of the increase to add to farm values.

On farms, the stage is set for another large harvest this summer and fall. Harvest of some crops will be later than usual this year, thanks to heavy and continued rains that delayed spring plantings in many areas. But this moisture promises to boost yields. This, in turn, lessens chances for a cut in crop tonnage this year. Yet, the Soil Bank is keeping production below what it might have been. It is slowing the rate of expansion in farm production while demand catches up.

The moisture was good for fall-planted crops, especially grain, hay, and pasture. On the whole, this is proving to be an outstanding forage year from one end of the country to the other. Pasture and range conditions as summer started were the best in many years. A big hay crop was in the making although curing was difficult in many places.

In contrast with crop prospects, meat production is lagging last year a little. This is a definite change from the several years of continuous build-up. With demand at a high level, the change in meat supply is being reflected in higher prices all along the line from consumer to producer.

Meanwhile, the battle between farm income and costs continues. The purchasing power of farm products, as measured by the parity ratio, has changed little in recent months and little change is expected in the months just ahead. On the average, both prices received and prices paid probably will be a little above last summer. By commodities, there are likely to be some important differences.

Potatoes

For instance, prices and purchasing power of potatoes will be under last summer but should improve as months go by. The large late spring crop brought low prices and a dismal finish to the winter marketing season. In turn, it leaves little chance for good potato prices this summer. Watch the markets closely. Dig and sell potatoes that can't be stored whenever track holdings slump a little. Hold others for better prices that will come if late crops fall more in line with last year's production. In time, processed potato products could take much of the seasonal fluctuations out of potato prices.

Fruits and nuts

Strawberries, in a jam in more ways than one this spring, may work part way out of their price difficulties a bit faster than was expected earlier. California sent more than usual to fresh markets this spring. At the same time, bad weather and low prices discouraged harvest in all producing areas. As a result the pack of frozen berries this year may be no larger, and could be smaller, than last year. This would give Oregon processors and co-op members quite a break in marketing this year's crop.

Other fruits and nuts should fare better than strawberries have this year. They aren't plagued with excessive carryovers from last year's crops.

(*Continued on page 16*)

POTATO prices will be under last summer's, but should improve. Large late spring crop leaves little chance for good prices this summer. Whenever track holdings slump, dig and sell those that can't be stored, and hold others for better prices that will come if late crop is smaller than last year's.

TREATED and untreated cattle were fed, handled alike, weighed periodically.

Stilbestrol Works With Several Feeds

Cooperative feeding trials with ranchers also has shown which level of stilbestrol brings highest gains.

STILBESTROL IMPLANTATIONS increased daily gains in 10 cattle-feeding trials underway in eastern Oregon, D. C. England, OSC animal husbandman, reports.

These trials were cooperative with local feeders and County Extension Agents, and were conducted this past year. In all of them, stilbestrol was implanted in the ear, and treated and untreated animals were fed together, handled alike. Synovex also was tested.

From these trials, England found:

¶ In yearlings and 2-year-olds, increased daily gains with 30 milligrams (mg.) of stilbestrol (compared to no hormone) varied from .06 pounds per steer to .99 pounds, averaging .41 pounds. Where 30 mg. and 45 mg. were compared, average daily increases from 30 mg. was .63 pounds per steer, 45 mg., .55 pounds.

Snyovex compared

¶ Comparing Synovex (a combination of two natural female hormones) and 30 mg. implanted stilbestrol (a synthetic hormone) to increased daily gain over controls (no hormone) showed Synovex, .18 pounds per steer, 30 mg. stilbestrol, .22 pounds. In one experiment, animals were fed an average grain ration of 16½ pounds per steer for 116 days. Thirty mg. stilbestrol increased daily gains by .35 pounds per steer, Synovex, .37 pounds.

¶ With steers on potatoes, average daily increases from 30 mg. stilbestrol ranged from .17 to .34 pounds. Both 45 mg. stilbestrol and Synovex gave slightly lower average increases.

¶ For steers fed 8 to 12 pounds grain and hay or silage, increased daily gains from 30 mg. stilbestrol ranged from .17 to .54 pounds per steer.

Comparison of 30 mg. Implanted Stilbestrol vs. Synovex

Feed source	Type of animal	Treatment	Average daily gain	Initial weight	Days on feed
			Pounds/day	*Pounds*	
Barley-wheat, alfalfa hay	Beef steers	Control	2.34	841	116
		30 mg.	2.69	828	116
		Synovex	2.71	784	116
Potatoes, grain straw	Beef steers	Control	2.62	896	57
		30 mg.	2.96	896	57
		Synovex	2.84	893	57
Potatoes, hay, grain	Beef steers	Control	2.01	857	84
		30 mg.	2.18	871	84
		Synovex	2.16	871	84
Grain, meadow hay	Beef steers	Control	1.86	854	81
		30 mg.	2.03	843	81
		Synovex	1.89	836	81
Peavine silage	Beef steers	Control	1.87	661	162
		30 mg.	1.96	661	162
		Synovex	1.98	659	162

¶ Animals fed 4 pounds grain, 2¼ pounds of a molasses-urea mix of 15 per cent protein equivalent, plus a mixture of grass hay and grass-Ladino clover silage also responded to stilbestrol. Increased daily gains from 30 mg. stilbestrol was .65 pounds, 45 mg. stilbestrol, .70 pounds.

Dairy steers gained

¶ Dairy steers implanted with 30 mg. stilbestrol gained an average of .32 pounds per day over those not implanted. Forty-five mg. stilbestrol-implanted steers gained .54 pounds.

¶ Spayed heifers increased average daily gains with 15 mg. stilbestrol—.52 pounds per animal. Thirty mg. stilbestrol, .42 pounds per day. These gains don't mean England endorses heifer spaying. It means that stilbestrol implants probably make up for some of the loss in estrogen production that occurs when ovaries are removed. Nonspayed heifers do not consistently show increased gains from stilbestrol implantation, and may suffer uterine prolapse.

¶ Steers on irrigated pasture with grain increased as much as feedlot steers. Response was greater to 30 mg. than to 45 mg. Additional pasture experiments are underway.

¶ Weaner calves fed out increased about .2 pounds per day with 30 mg. compared to controls. Additional research is underway on dosages and time of implantation.

¶ Few undesirable effects were noted. Some riding occured, but feeders did not consider it serious enough to be objectionable. A few spayed heifers came in heat.

From these results, England concludes:

¶ Beef steers on all rations tested responded to stilbestrol implantations, and use of this hormone is recommended.

¶ Thirty mg. of stilbestrol appears same—and frequently more—increased daily gain than 45 mg. Thirty or 36 mg. appears to give maximum increases in most feeding situations. Large-framed dairy steers may respond better to 45 mg.

¶ Dosages at the levels tested did not produce serious side effects that would cause trouble in the feed lot.

¶ Thirty mg. of stilbestrol appears to produce as much or more increased growth as Synovex. Stilbestrol implants cost less than Synovex.

¶ Spayed heifers respond to stilbestrol, and 15 mg. appears to be enough.

¶ Dairy steers respond as much as beef steers to stilbestrol.

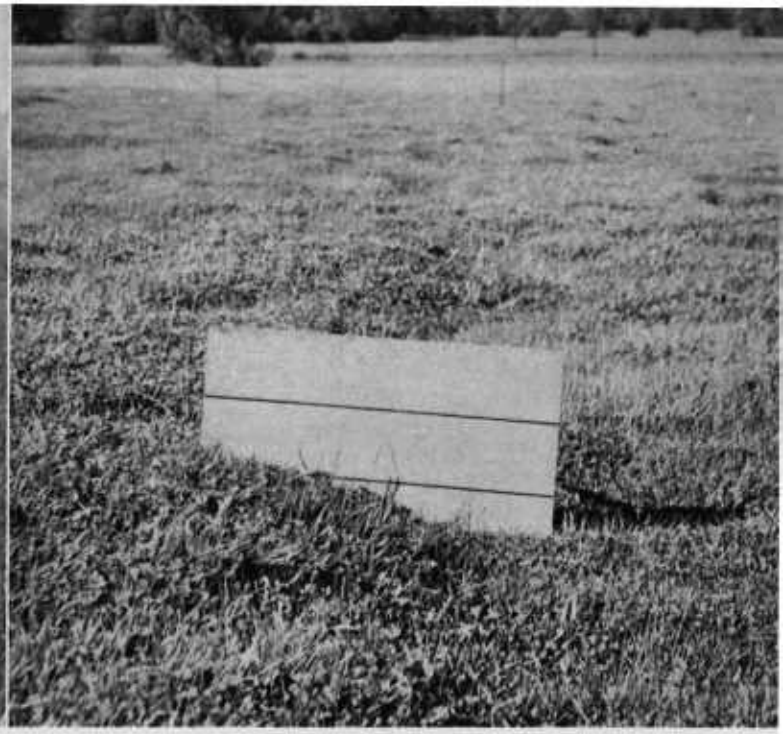
¶ Thirty mg. of stilbestrol is a satisfactory level for weaner calves on a fattening ration. Response occurs on both a high- and low-grain ration.

Comparison of 30 mg. vs. 45 mg. Implanted Stilbestrol

Feed source	Type of animal	Treatment	Average daily gain	Initial weight	Days on feed
			Pounds/day	*Pounds*	
Potatoes, grain, straw	Beef steers	Control	2.62	896	57
		30 mg.	2.96	896	57
		45 mg.	2.92	916	57
4 pounds barley-oats, grass-clover silage, grass hay, 2 pounds protein supplement	Beef steers	Control	1.97	755	65
		30 mg.	2.62	738	65
		45 mg.	2.67	729	65
Grain, protein supplement, wheat-rye hay	Beef steers	Control	1.35	780	56
		30 mg.	1.89	812	56
		45 mg.	2.09	805	56
Irrigated pasture, barley and screenings	Beef steers	Control	2.08	850	51
		30 mg.	3.07	869	51
		45 mg.	2.58	850	51
Peavine silage, grain	Dairy steers	Control	1.67	888	87
		30 mg.	1.99	869	87
		45 mg.	2.21	870	87

STILBESTROL-FED steers on peavine silage gained a tenth of a pound per day more than non-implanted steers. Synovex-treated animals gained slightly more, but animal husbandman D. C. England concludes from other comparative trials that increase in gain between hormone types is about equal.

POTASH increased alfalfa-grass yields on this Columbia County farm. Tests indicate 6 per cent of the Willamette Valley's soils are low in potash.



PHOSPHORUS AND POTASH were needed to increase subterranean clover yield in Douglas County. Soils in southern Willamette Valley are lower in P.

Your Soil May Need These Foods

Analysis of 12,500 soil samples is showing us in general where soils may need lime, phosphorus, or potash. A soil test is the best way to find out, however.

ALFALFA will respond to lime, as shown in this Columbia County trial. Tests from the Willamette Valley indicate soils are moderately acid throughout the area, need from 1 to 4 tons lime per acre.

A GENERAL FERTILITY picture of Oregon's soils is forming from analysis of 12,500 samples by the OSC Soil Testing Laboratory in the past 4 years.

What is showing up cannot be used for specific fertilizer recommendations for a particular farm. But soil scientist Larry Alban says the information is valuable in giving a general indication of what nutrients are deficient in an area. Best way to find your specific fertilizer needs is to have your soil tested. And checking with your County Extension Agent is the place to start.

Average nutrient levels for phosphorus, potassium, and lime needs are graphed. In addition, Alban summarized what he found area-by-area:

Coast. Soils are highly acid, with a high lime requirement. Soils also

are low in phosphorus. Of 1,298 soils tested in this area, 80 per cent were below a pH of 5.5, only 1½ per cent above a pH 6.0. More than 60 per cent of the soils need 4 tons of lime or more per acre to raise the pH to neutrality (7.0), and 80 per cent tested were low in phosphorus. Potassium showed up as deficient in 11 per cent of the soils tested.

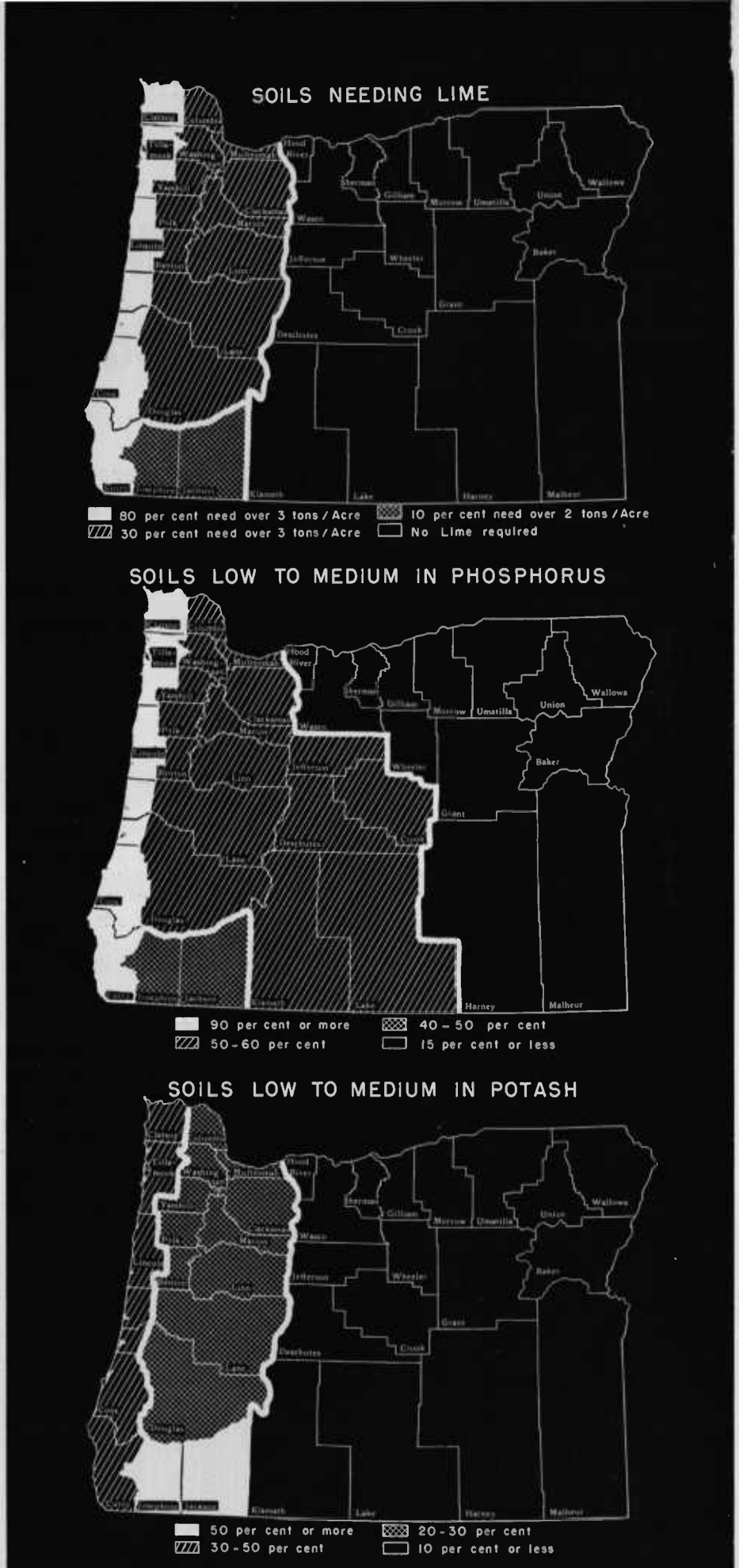
Willamette Valley. Soils are moderately acid with about 60 per cent of those tested in the pH 5.5-6.0 range. Lime needs were widespread throughout the area, ranging from 1 to 4 tons per acre. Need for phosphorus was indicated, too. About 38 per cent of the soils tested were either low or very low in this nutrient. Only 6 per cent tested low in potassium.

Soils in the northern end of the Valley were higher in phosphorus than those in the southern parts. No such trend showed up for potassium. Each county had about the same percentage of soil test values at each potassium level.

Southern Oregon. Seventy-two per cent of the soils tested were in the 5.8 to 6.5 pH range. Of the remainder, about half were above, half below this range. Ninety per cent appear to need less than 2 tons of lime per acre, with 30 per cent requiring none. Phosphorus was low on 18 per cent, potassium was low on 23 per cent of the soils tested.

Central Oregon. About half the soils were below pH 7.0, half above. These soils are becoming acid, however, probably due to the large amounts of sulfur being applied in current fertilizer programs. About the same percentages of soils were found in each level of phosphorus (about half in the low and medium group, half in the high and very high group). Almost all soils were high to very high in potassium. Of the soils in this area testing high to very high in total salts and sodium, the majority were from Klamath and Lake Counties.

Eastern Oregon. A large number of soils (25 per cent) were below pH 6.5. These were found mostly in areas near the Blue and Wallowa Mountains. Some soils that were above a pH of 8.0 were also very high in sodium and total salts. About 88 per cent of the soils tested were high to very high in phosphorus, 95 per cent were high to very high in potassium.



Which Barley-Corn Mix For Cheapest Turkey Gains?

Barley in combination with corn will bring cheaper gains than all corn. Two OSC researchers report a method of figuring the cheapest barley-corn mix.

CHEAPEST GROWING gains under estimated prices came from 60-40 barley-corn mix in the developer, although you can predict cheapest gains from any barley-corn-wheat price combination. Economic analysis was based on feed requirements of turkeys on experimental rations that are comparable to many local feeding situations.

A PROBABLE big barley harvest this summer means Oregon turkey feeders may cash in on cheap feed.

For barley in combination with corn will bring cheaper gains than all corn, according to agricultural economist W. G. Brown and poultryman J. A. Harper.

They base their prediction on an economic analysis of feed requirements from Harper's 1956 feeding trials. He fed Broad-Breasted Bronze poults 8 to 24 weeks, comparing corn vs. barley for growth and feed conversion. Grain in the experimental developer was either all corn, half corn-half barley, or all barley. Free choice whole wheat also was available. In one treatment, free choice barley was substituted. The developer contained about 20 per cent protein.

Duplicate lots were fed the corn-barley developer either as mash or pellet, so the possible advantage of pellets could be compared. Sixteen weeks of feeding brought the birds up to an average of 18 pounds, but for economic analysis, Brown divided the feeding period into a growing period—4 to 13 pounds—and a finishing period—13 to 18 pounds.

Figure 1 shows the amount of feed needed for turkeys from 4 to 13 pounds. But to find which barley-corn mix brought cheapest gains, Brown says you'll need to sharpen your pencil. Here is an example:

¶ Fifty-six per cent of Harper's experimental developer was grain, 44 per cent nongrain—protein, vitamin, and mineral supplements.

¶ Corn is assumed to cost $3.10 per cwt., barley $2.25 per cwt.

¶ Nongrain portion of the mix cost $4.80 per cwt.

¶ Allowing $.75 per cwt. for mixing, selling, and delivery, Brown estimated the total cost for mash with all corn as the grain at $4.60 per cwt., barley, $4.12. Wheat fed free choice was figured at $3.85 per cwt.

¶ With these prices, the following table shows the price of mash per cwt.:

Barley in Mix	Corn in Mix	Price of Mash
Per cent	*Per cent*	*Dollars*
100	0	4.12
90	10	4.17
80	20	4.22
70	30	4.26
60	40	4.31
50	50	4.36
40	60	4.41
30	70	4.46
20	80	4.50
10	90	4.55
0	100	4.60

¶ Pegging these costs (plus that of wheat) to how well turkeys gained on each barley-corn mix means you must figure the cost of gain per bird for each mix. Brown did it this way: take for example the 100 per cent barley mix. First, multiply the price of mash (in cents per pound)—$.0412—times 24.94 pounds of mash required to reach 13 pounds (figure 1) and 10.26 pounds of wheat times $.0385. This gives you $1.03 and $.39. Then add $1.03 and $0.39, which totals $1.42—the cost it took to get each bird from 4 to 13 pounds. These costs for various barley-corn mixes are plotted in figure 2, and show that a 60-40 ratio in the developer was the cheapest—$1.37. All corn was $1.46 per turkey.

Brown estimated feeding barley as the *only* grain (both free choice grain and in pelleted developer) was more profitable than any barley-corn combination with free-choice wheat. This was true only for the 4- to 13-pound growing period. Some wheat or corn is needed for finishing.

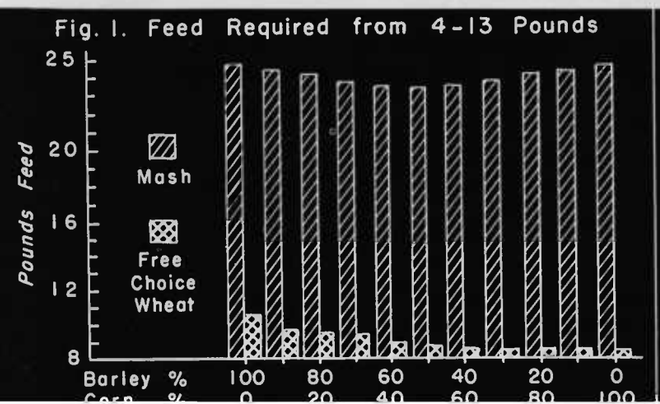
Figuring the cheapest barley-corn mix for the finishing ration is much the same, Brown points out. Figure 3 shows the feed requirements for a turkey from 13 to 18 pounds. Assuming the same grain and other feed costs as above, you can figure the per bird cost of mash and wheat. These costs, plotted in figure 4, show that the 40-60 barley-corn mix resulted in the cheapest gains—$1.15.

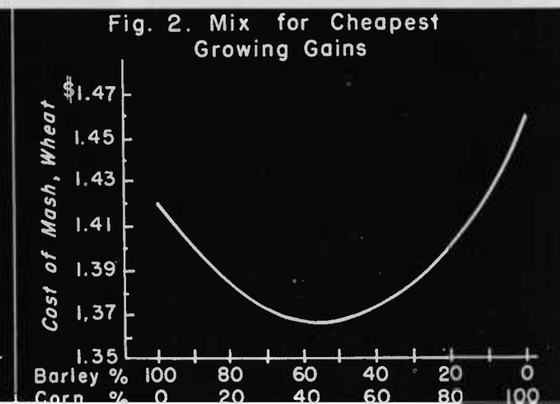
All of the above examples were on a mash basis. Brown figures that pelleting (with wheat free choice) didn't return enough in increased gain to pay estimated pelleting costs (about $6.00 per ewt).

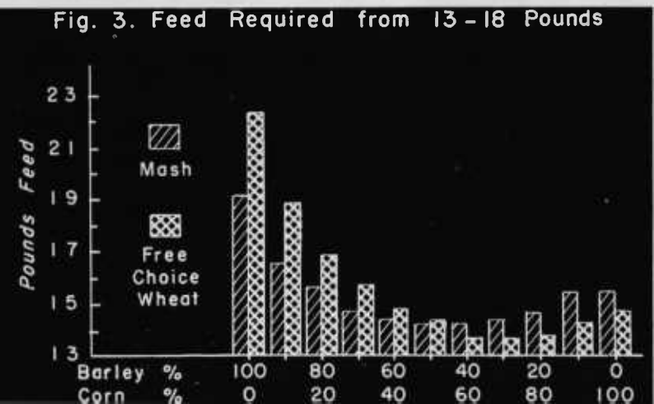
The two researchers point out two important limitations when using the above method, or when using the graphs for your situation:

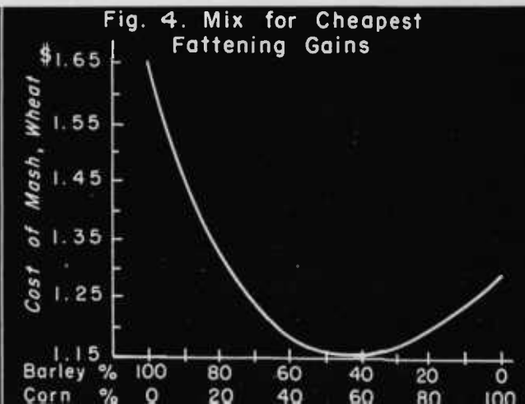
¶ The mix which produced the cheapest gain was based on estimated grain and other feed costs. Be sure to use actual costs to you if they are much different from those the researchers used above.

¶ The above feed requirement figures were based on Harper's research, and may be different from your feeding situation. The poultryman tried to conduct his trials so results would apply to the feeding situation of many Oregon turkey feeders. But if yours is much different, you may get different results.









Vitamin Needs for Healthy Living

Basic research on vitamin needs centers around measuring the vitamin blood level of healthy people on a controlled diet. What home economists are finding is giving a clearer picture of our daily needs.

FOUR OSC home nutritionists stayed on a controlled diet 30 days during tests. They were from left (facing camara) Margaret Fincke, Clara Storvick, Nina Morlay, and Batty Hawthorna (back to camara).

HOW MUCH of each vitamin do you, a healthy person, need? Can vitamin pills hinder more than help? Can blood tests signal a vitamin deficiency before visible symptoms occur?

Answers to these questions are not yet known, but basic research by OSC home economists Clara A. Storvick, Margaret Edwards, Ida Irgens-Möller, Muriel Woodring, and Nina Morley is giving human nutritionists a clearer picture of vitamin requirements for normal, healthy people, as well as how we can better measure the vitamins our digestive systems extract from the food we eat.

The key to knowing daily vitamin needs lies in measuring vitamin levels found in healthy people maintained on a normal, controlled diet for a long time.

Stayed on test diet

For vitamin C (ascorbic acid), B_1 (thiamine), vitamin B_2 (riboflavin) and another B vitamin (niacin), Storvick did just that. She and her fellow workers kept themselves on the same diet for 30 days, analyzing vitamin levels in various blood fractions* from fingertip samples. Samples (3 ml.) of fingertip blood were taken before breakfast each day. In addition, a larger amount of blood was taken from the vein of one subject before the ex-

* Vitamin levels were analyzed in the blood fractions of whole blood—red and white blood cells, serum, or plasma.

periment began, to serve as a daily control.

The researcher believes control diets—using natural foods—is the best basis for measuring concentrations in the blood for predicting vitamin needs. Natural foods were considered important. Storvick figured they were less likely to encounter a deficiency in some nutrient not yet discovered (see page 15).

Diet which the researchers used:

Breakfast

Orange juice
Cream of Wheat (unenriched)
Brown sugar
Wheat germ
Soft cooked egg
Evaporated milk

Lunch

Biscuits
Butter
Cheddar cheese
Canned green beans
Stewed prunes
Black coffee

Dinner

Broiled ground round steak
Canned carrots
Biscuits
Butter
Canned peaches
Black coffee

In addition, special-recipe cookies were eaten to bring up the protein, fat, and carbohydrates to predicted needs. All foods were analyzed for essential nutrients to make sure the diet adequately met National Research Council recommendations. Test subjects maintained their weight, remained healthy throughout the trials.

DAILY FINGERTIP samples of blood were drawn before breakfast for analysis of vitamin levels in blood. Tests included analysis for amounts of thiamin, riboflavin, ascorbic acid, and niacin.

Research summarized

Summing up more than 10 years work with these 4 vitamins, Storvick reports:

¶ For ascorbic acid, 70 mg. per day was the average amount test subjects required. They also found that vitamin C was not stored as well as nonwater soluble vitamins. This nutrient should be supplied daily. Blood serum contains twice as much ascorbic acid as whole blood; white blood cells 50 times more than whole blood. This was expected since white blood cells are our first defense line against infection, and these cells are normally saturated with vitamin C, which is essential in the healing process. Vitamin C is destroyed quickly at room temperature unless protected by acid. Fortunately, natural acid-containing foods such as orange juice, tomatoes, and grapefruit are rich sources of ascorbic acid.

¶ For thiamine (vitamin B_1) the workers found daily needs were about 1.1 mg. Red blood cells were twice as high in thiamine as whole blood. Thiamine is essential, among other functions, in converting carbohydrates to fat. Comparing thiamine levels from blood samples of different animals, Storvick found wide differences, probably due to the animal's ability to convert starches to fat. Horse blood, for example, was lowest, containing about 1½ micrograms (mcg.) per 100 milliliter (ml.) of blood, while hog blood has the highest amount—10½ mcg. per 100 ml. of blood. Man averaged 5 mcg. per 100 ml. Most animal products are natural sources of vitamin B_1—espec-

RIBOFLAVIN determinations showed that white blood cells contained 100 times as much Vitamin B_2 as blood serum. Estimated human daily needs are 1.4 milligrams. This vitamin is essential for growth.

SAMPLED BLOOD is spun into its various fractions by this centrifuge. Vitamin levels in blood of test subjects are analyzed in the fractions of whole blood, serum, plasma, and red, white blood cells.

ially pork and beef liver.

¶ For riboflavin, (vitamin B_2), Storvick estimated daily needs at 1.4 mg. with whole blood containing 3 times as much as serum, red blood cells 4 times as much, and white blood cells, 100 times as much. Vitamin B_2 is essential for growth. It is found naturally in eggs, milk, and liver. Light destroys riboflavin.

Niacin prevents pellagra

¶ For niacin, (one of the B complex vitamins), daily needs were estimated at 11 mg. Red and white blood cells contained about twice as much as whole blood. The day-to-day level in red blood cells and whole blood was even, offering the most reliable part of the blood to measure. Niacin is found naturally in meat, peas, and beans. It is an important pellagra preventative. In the U. S., pellagra has occurred mostly in the South, where diets are high in corn and other starches, low in protein.

¶ The body does not store much of these 4 vitamins, and in times of stress, requirements are high. If needs aren't met, we suffer from insufficient reserves. For that reason, vitamin pills are sometimes taken. Storvick found in her research that excessive intake of one vitamin may lead to a deficiency in some other vitamin, for when you increase the intake of one B vitamin, you step up the requirements for other associated B vitamins. That's one reason why the researcher favors the use of natural foods, where there is some balance in essential nutrients.

Other studies planned

Other relationships among B-complex vitamins are drawing the home economist's attention. For example vitamin B_6, as well as other B vitamins, helps in manufacturing amino acids—basic units of protein used primarily in tissue building. From the amino acid tryptophane, obtained from proteins such as meats, the body can manufacture enough niacin to supply daily needs. This conversion of tryptophane to niacin, along with interactions with other vitamins, is what Storvick and associates are hoping to study next. This will mean more human test subjects maintained on diets controlled not only in vitamins, but in amino acids too. By doing so, home economists hope to have a clearer picture of the nutrition needs for healthy people.

Three methods of measuring available phosphorus show you can supply . . .

Six Years Phosphorus Needs In One Application

SUGAR BEETS were the only crop in the rotation that increased yields from phosphorus application.

A SINGLE, HEAVY phosphorus application has supplied the phosphorus needs of crops for 6 years, according to A. S. Hunter, OSC-USDA soil scientist.

Research at the Malheur branch experiment station has shown that 210 pounds of actual P (480 pounds P_2O_5) supplied enough phosphorus for a 6-year alfalfa-corn-sugar beet rotation. Soil was Owhyee silt loam.

Before seeding alfalfa in 1951, phosphorus was applied at rates of 0, 26, 53, 105, and 210 pounds of P per acre. That's 0, 60, 120, 240, and 480 pounds of P_2O_5. The treble superphosphate was banded 7 inches apart, 3 to 5 inches deep.

Phosphorus removed

Crop analysis indicated that those on the 26, 53, 105, and 210 pounds P plots removed 12, 21, 41, and 53 pounds more P in the five years than plots receiving no P. That's 45, 39, 39, and 28 per cent of the amount applied respectively. Only sugar beets responded yield-wise to phosphorus treatments.

Last year, Hunter used 3 methods to find out which P application still supplied enough nutrient for high beet yields. For one, soil samples were analyzed for available phosphorus. In another, radioactive P was applied to certain rows, permitting measurement of how much P applied in 1956 was taken up by the beets, and how much P in the soil was as available to the beets as the radioactive P. In a third, the soil scientist applied 36 pounds P (80 pounds P_2O_5) per acre to half the plots treated in 1951, and measured the yields. Yield increases are tabled.

210 pounds P enough

All methods showed the same result: P applied at 210 pounds per acre in 1951 provided ample available phosphorus for the 6-year rotation. In fact, Hunter thinks it may provide enough phosphorus for more than 6 years.

There was no residual phosphorus found on the 26 and 53 pound P plots. Some amount between 105 and 210 pounds actual phosphorus per acre supplied the needs for this nutrient during the 6-year rotation.

Heavy Phosphorus Application Supplies Crop Needs

Rate of phosphorus applied in 1951	1956 Sugar Beet Yields	
	P not added in 1956	35 pounds P/acre added in 1956
Pounds/acre	*Tons/acre*	*Tons/acre*
0	24.7	27.6
26	27.3	31.3
52	24.3	30.5
105	29.9	33.7
210	32.5	32.7

Research Briefs

Unidentified Nutrients Found in Egg Yolk • **How Smuts Get Energy** • **Bacteria May Cause Nitrogen Losses**

Wheat Farmers Give Reasons for Signing, Not Signing 1956 Soil Bank

NON-GRAZING provision of the acreage reserve was the main reason wheat farmers gave for not participating in the 1956 Soil Bank.

That's the report from agricultural economists W. G. Brown and Pius Welsgarber.

They asked 30 wheat farmers in Morrow and Gilliam Counties why they had not signed up for the Soil Bank. They also asked 18 who did sign to their reasons, too.

One reason for the survey was the big difference in sign-up between wheat farmers in Gilliam and Morrow Counties—where crop-growing conditions are much the same. In Gilliam County, 9 per cent of the wheat allotment went into the Bank, while in Morrow County, 22 per cent was signed up. Twenty-eight per cent of the farmers with allotments signed up in Gilliam County, 41 per cent in Morrow County.

The economists sampled signers and non-signers by size of farm: small (under 399 acres of wheat), medium (400-700 acres), and large (more than 800 acres). Their results showed size of farm did not influence participation —about equal numbers of signers and non-signers were in each farm-size group.

Reasons for not signing

The non-grazing provision was cited most in Gilliam County. Ten of the 15 contacted gave it as a reason. Seven of the 10 said it was their chief reason, 4 said it was their only reason.

In Morrow County, 4 cited the non-grazing clause as a reason for not participating, but none said it was his only reason.

Another big reason non-signers gave was their belief that wheat was a more reliable crop than barley—especially on lighter and shallower soils. Uncertainty about the barley support price also created hesitancy for signing. Growers estimated it took from 2 to 4 operations to prepare a seedbed for spring barley. With a reliable fall-seeded crop, time and equipment could be spent for summer fallowing.

Five non-signers in Morrow County and 3 in Gilliam County estimated their 1957 yields would be higher than "normal." Some farmers said this had influenced their decision not to sign, while others indicated it had not. Five reported they didn't understand the Soil Bank, but admitted they had had the opportunity to become informed.

Reasons for signing

Eight of the 9 who signed up in Morrow County believed they would receive more from the Bank than if they had seeded all their allotted wheat.

Four participants mentioned crop insurance on their barley as another feature which influenced their decision to sign. Insurance, plus acreage reserve payment, guaranteed a high return in some cases.

Two signers put all their allotment in the acreage reserve, while 5 signed up half. Four of those wished they had put all of their allotment in the Bank. One put it this way, "I was too conservative to sign up more than 50 per cent, even though it seemed like a good deal."

The 9 signers in Gilliam County appeared less enthusiastic than those in Morrow County, according to the economists. One Gilliam County-participant signed up his total allotment. Six signed up an average of 27 per cent of their allotment, primarily because some of their fields intended for wheat joined a field that was going into barley. They put these adjoining acres into barley—and the Bank—to "experiment" with participation.

BELIEF that wheat is a more reliable crop than barley was one of several reasons farmers gave for not putting some of their allotment in the 1956 Soil Bank. Non-grazing clause was the main reason.

CHICKS fed a ration containing egg yolk gained a fourth more than those on a non-yolk ration. OSC poultryman George Arscott thinks dried egg yolk contains one or more unidentified vitamins.

Egg Yolk Source of Chick Growth

PROOF THAT all the nutrients essential to growth and health have not been discovered comes from George Arscott, OSC poultryman and Paul Weswig and John Schubert, chemists.

They are finding unknown growth-promoting activity in several feedstuffs, and believes they stem from two or more unidentified vitamins. A good source for these growth stimulants is dried egg yolk and fish solubles.

Chicks fed a ration of soybean meal —adequately fortified with all known nutrients essential to growth and supplemented with fish solubles—gained 12 per cent more than chicks on a similar ration without fish solubles.

Chicks gained more

Dried egg yolk added to the basal or control ration with or without fish solubles gained 25 per cent more than those on the control, and about 13 per cent more than those on the fish soluble ration, indicating that fish solubles contain one, but egg yolk contains more than one unidentified growth stimulant, probably a vitamin.

Dried egg yolk extracted with a fat solvent reduced the yolk to two fractions. Either one added to the control ration increased growth about half of that obtained when dried egg yolk supplemented the ration. Both fractions added brought up the growth rate to that of egg yolk.

Other chick studies have shown that this growth response is not due to several known yolk components—fatty acids, cholesterol, and ash.

Increased growth also has been found with fluid turkey and chicken yolk added to the chicken diet. Poults likewise responded to egg yolk, but not as much as chicks.

What finding means

While these findings may not benefit poultry feeders immediately (since egg yolk in a poultry ration is economically impractical), it provides researchers with a rich source of unidentified nutrients for eventual isolation and identification.

Once this is accomplished, another link will be forged in our chain of nutritional knowledge for animal and human health and well-being.

Arscott points out that eggs originally served as a food source for the developing chick embryo, and provided a reserve of energy, protein, and vitamins in the early life of the rapidly growing chick.

He thinks this fact may have been overlooked in the search for sources of these unidentified nutrients required for rapid growth.

How Smuts Get Food Found by Chemists

THE CHEMICAL PATHWAYS by which wheat smut fungi convert sugars they sap from the wheat plant to energy for cell building and growth have been mapped by chemists Robert Newburgh and Vernon Cheldelin.

This identification puts the researchers a step closer to devising "tailormade" chemicals which will not damage the wheat seed, yet will kill the fungus by blocking its ability to obtain energy.

Smuts in the laboratory were grown on protein, vitamins, and minerals, permitting rapid growth in a short time. The lab-grown fungus was compared with smut spores collected in the field for ability to burn plant sugars. By using radioactive sugar, the workers found that both smuts used the same pathways, but field-collected spores used more of one pathway than lab-grown smuts.

This finding will help Newburgh and Cheldelin use the faster-growing lab smuts in future tests, since they are confident they now can predict how field spores will respond.

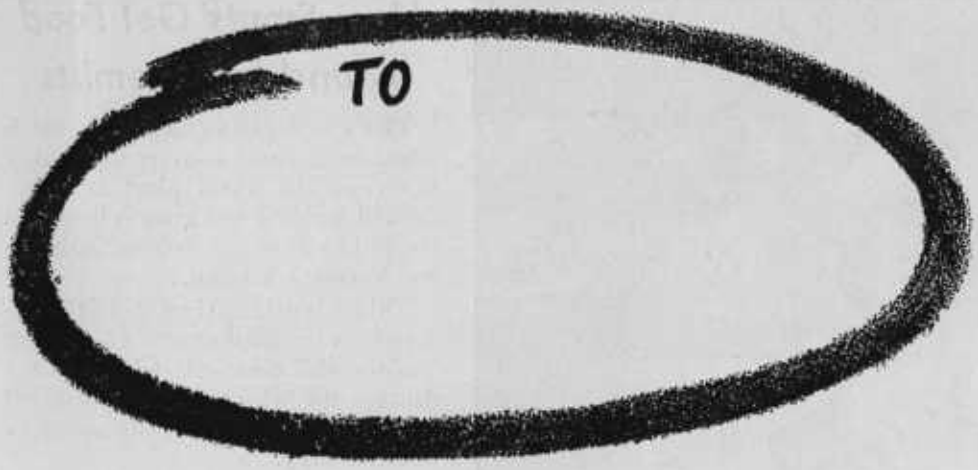
Soil Bacteria May Cause High Nitrogen Losses

SOIL BACTERIA capable of converting nitrogen fertilizer to gases that plants can't use may be causing high nitrogen losses.

At least that's what OSC bacteriologists C. M. Gilmour and W. B. Bollen have found with laboratory experiments. Their study of Columbia Basin wheatland soils indicate they contain soil bacteria that can cause nitrogen losses.

Under present laboratory tests, the workers report these bacteria are greatest in soils that have excess moisture, high temperature, and large amounts of wheat straw and other organic matter. Actual losses have ranged from 8 to 55 per cent of nitrogen applied.

Bollen and Gilmour don't know if these losses will be as high under field conditions, and are planning field trials at the Pendleton branch station this year.



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Farm Outlook . . .

(Continued from page 3)

Larger crops may prevent prices from coming quite up to last year's levels but total returns should compare favorably.

Wheat

The carryover of wheat has been reduced for the first time in several years but the new crop now seems likely to be almost as large as last year, despite the Soil Bank. Without the Soil Bank, the crop could have been many million bushels larger and there would be little chance for prices above supports. Now, with better foreign crops than a year ago, export prospects don't look so good. Even though sizeable subsidies are continued, chances for a repeat of this spring's highs for white wheat don't seem as good as they did earlier.

Feed grain

Barley and oats prices this summer are likely to stay below a year earlier. Supplies are large and supports are around $3 a ton lower. In Oregon and the rest of the Northwest, large carryovers and large new crops, especially of barley, are likely. More than usual may be exposed to fall frosts and rain due to late plantings. Use for malt has changed little in recent years.

Forage

In addition to favorable conditions for forage, Oregon farms and ranches carried over the largest tonnage of hay in many years. Prices this summer and fall will be low enough to interest some hay raisers in feeding livestock on shares during the winter. Such deals will require careful figuring but hay fed on farms where grown now seems likely to bring better returns than hay sold for cash.

Cattle

The seasonal price increase in fed cattle this summer is likely to be gradual and smaller than last summer. Many feeders remember last summer's price rise and are likely to crowd more cattle onto the market in the next three months. The price peak may be earlier and a bit under last September's peak unless marketings are bunched in July. Some seasonal decline in prices of feeders is expected this summer, but prices should stay above a year ago. Fewer calves and yearlings were carried over this year and rising prices for fed cattle will help strengthen the market. More grass cattle probably will carry slaughter finish than last year, especially in the Southwest where range conditions have improved.

Hogs

Hog numbers appear to be reaching a turning point again after a cut back last year. The spring pig crop equaled the spring of 1956 and a small gain in numbers is expected this fall. Unless fall farrowings are well over reported intentions, the increase in pork production should leave hog prices about like the past winter. Through this summer and early fall, prices are expected to stay above a year earlier and at the highest level in three years, although they will decline seasonally as receipts from the 1957 spring crop increase.

Lambs

Prices of early lambs did not hold up as well as expected. Good feed in California, Texas, and other parts of the Southwest slowed marketing and increased supply of fat slaughter lambs in May and June. As a result, prices this summer may not decline as much as usual.

Eggs

Production will be lower and prices higher this fall than in the fall of 1956. Cut in output will result from sharp reduction in the 1957 replacement hatch. Effects of the smaller output will be partly offset by more old hens being kept, a further rise in the rate of lay per bird, and moderately larger stored supplies. By September, prices are likely to move above those of a year earlier. They are expected to stay well above during the remainder of 1957.

Broilers

Summer prices probably will be above those of a year earlier. Broiler production will be up only slightly and marketings of young chickens from egg laying flocks will be down. Supply of beef and pork will also be smaller during the summer months. By October, broilers could be back in trouble. It will pay to watch placement figures closely.