

# MINNESOTA



University of Minnesota Agricultural Extension Service, University Farm, St. Paul

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## Turkey Trials Show Feeding Effects

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ONE WAY to keep down the cost of hatching turkey eggs is to find simplified but effective ways of feeding breeder hens. This past year four different methods of feeding were compared to find their advantages or disadvantages.

The regular feeding system consisted of the regular 22 per cent turkey breeder mash mixed with an equal part of whole grains. The grain was one-half whole corn and one-half whole oats.

Group 2 was fed an all-mash ration that was like the previous one except that the corn and oats were ground.

Group 3 was fed a 28 per cent grain balancer, and whole corn and oats were fed free choice in separate hoppers. This was to determine whether the free-choice grain feeding would be as satisfactory for turkeys as it seems to be for chickens.

The ration for group 4 was the same as for the first except that the mash had increased amounts of vitamins A, D, riboflavin, B<sub>12</sub>, and also contained 5 per cent dried milk not present in the other rations. This mash was used since we frequently hear the recommendation that birds be "supercharged" with vitamins during the hatching season. It should be emphasized that the regular breeder mash is calculated to have enough of the known vitamins and minerals and to have good quality protein.

The experiment ran for 105 days, from January 10 through April 25. The lights in the poultry house were kept on during the experiment for 14 hours daily.

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### Differences in Production

There did not seem to be any great difference in number of eggs produced although the birds getting the free-choice grain and the 28 per cent grain balancer laid a few more eggs per hen. The birds on the all-mash ration did not lay quite as well by about six or seven eggs per bird. Apparently, the birds did not like the all-mash as well as they did the mixtures of grain and mash.

Where the grain was mixed in the mash production was satisfactory, but supercharging the mash with vitamins did not seem to help production.

### Effect on Hatchability

Eggs produced by birds on the grain and mash mixture hatched well and were hatching as well at the end of the experiment as at the beginning. Eggs of birds on the all-mash ration dropped about 14 per cent in hatchability. While the production on the free-choice grain pens was very satisfactory, hatchability was reduced. You may note in the table that the hatchability of eggs from birds on the free-choice grain during the first two hatches was just as satisfactory as in the other pens, but at the end it had dropped about 16 per cent. This might possibly be explained by the fact that there was a marked decrease in mash consumption toward the end of the ex-

periment as compared with the beginning. This would affect the amount consumed of some of the important hatchability nutrients such as riboflavin and B<sub>12</sub> as well as the other vitamins fed only in the mash. It was calculated that the theoretical grain-to-mash ratio should be about 2.5:1, but for the total period the grain-to-mash ratio in this particular pen was 4.6:1. This means, of course, the birds did not eat as much mash as they should have to get the necessary vitamins and minerals. This probably means that while this system of feeding may be satisfactory for production, the mash should be fortified for maximum hatchability.

The result of the feeding of extra amounts of the important hatchability vitamins did not indicate that these "extras" had any benefit either for production or for hatchability.

It should be emphasized here that these results are only from one year's experiment. They probably cannot be taken as absolute proof of differences among the systems of feeding. For that reason some of the systems will be tried again this year. On the basis of this year's results, however, it does seem that the all-mash ration was not quite as satisfactory as the others, either for production or hatchability. This ration actually had the highest feed consumption per egg produced of all lots.

(Continued on page 2.)

Results of One Year's Trial of Four Turkey Feeding Systems

	Grain in mash	All-mash	Free choice Corn + oats + 28% mash	Extra vita- min mash
Egg production per hen	49.7	45.7	53.0	51.2
Per cent of fertile eggs pipped	12.3	14.2	20.9	16.7
Per cent fertile eggs hatched	77.5	73.5	69.7	71.2
First two hatches	80.1	80.6	83.8	71.1
Last two hatches	81.1	66.5	68.1	68.9
Feed per hen	70.0	67.0	75.9	73.6
Feed per egg	1.43	1.47	1.44	1.44
Per cent protein in ration (calculated)	16.9	16.9	14.1	17.8
Riboflavin, milligrams per pound (calculated)	1.92	1.92	1.22	3.05
Units of Vitamin D per pound (calculated)	996	986	549	1992
Ratio of grain to mash	1:1	0:1	4.58:1	1:1
Theoretical ratio for 16 per cent	1:1	0:1	2.45:1	1:1



# New Seed Law Safeguards Both Farmer and Seedsman

O. A. ULVIN\*

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(Continued from page 1.)

The whole grain mixed with the mash seemed to be a satisfactory ration both for production and hatchability. It is easy to feed and thus will appeal to a number of turkey growers. It is already being used by some egg producers and at University Farm with results that apparently are satisfactory.

The results from the free-choice grain pens suggest that while this system may be satisfactory for production, it might not be as satisfactory for hatchability unless the mash is adjusted to make up for the lower proportion of mash eaten. However, the birds on this ration consumed only about 14 per cent protein while birds in the other pens got about 17 per cent protein. This suggests that perhaps 16 to 17 per cent is higher than necessary for good production. The proper protein level for breeding turkeys has not yet been determined accurately. It is a common belief that it should be a little higher than for hens but perhaps this is not true.

A few interesting observations were made in the two pens getting the free-choice grain. In one pen the percentage of mash consumed dropped from 25 to 15 per cent during the experiment and in the other pen on the same ration it dropped from 21 to 14 per cent. Also it was noted that the birds ate nearly half of their total ration of corn during the first four weeks, but during the last three weeks only about one-fourth of their ration was corn. On the other hand the oats consumption increased from about one-third of the total ration during the first four weeks to about 60 per cent of the ration during the last three weeks. Whether the reduction in mash consumption is related to the increase of oats consumed is a question that remains unanswered. Repeat trials, planned for this coming year, may furnish answers to this and other questions on feeding effects.

RECODING, REGIONAL recommendations and guards against unscrupulous seed salesmen are some of the features of the new Minnesota seed law. The law, passed by the 1951 Legislature and made effective July 1, 1951, repealed the old, outmoded seed law.

The coding of the old seed act had become outdated, ambiguous, and confusing. Amendments had been added from time to time since the enactment of the original act in 1913 and had made the old seed law a jig-saw puzzle. The new seed law is unified, with specific, easy-to-find information.

## Noxious Weed Seeds Regulated

There has been an effort in the past ten years to make the seed laws of the states uniform for the various regions, especially with reference to noxious weed seeds. Federal and state seed control officials have divided the states into eight regions, each region including states with similar agricultural conditions and problems. Minnesota was placed in Region 2 along with Michigan, Wisconsin, North and South Dakota, Nebraska, and Iowa.

The new seed law provides the following:

1. All seed sold in Minnesota must be properly labeled as required by law.

2. All agricultural seed sold in Minnesota must not contain prohibited or restricted weed seeds in excess of 2 per ounce or 25 per pound. (The prohibited noxious weed seeds are Canada thistle, field bindweed, leafy spurge, perennial pepper grass, perennial sow thistle, Russian knapweed, and quackgrass; the restricted noxious weed seeds are buckhorn plantain, dodder, Frenchweed, hoary alyssum, horse nettle, and wild mustard.)

3. All agricultural seeds must not contain more than 1 per cent by weight of all weed seeds. (The old seed law permitted up to 2 per cent of all weed seeds.)

## Misrepresentations Curbed

The old seed law covered the sale of seed only and not representations or misrepresentations of salesmen. Under

the old law, it was necessary to find something wrong with the seed itself before any prosecution could be brought against the salesmen, even if they had made misrepresentations in the sale.

The new seed law makes it illegal for any person to make false or misleading advertisements concerning agricultural seeds. Advertisement as defined under the law means any representation, other than on a label, disseminated in any manner or by any means, relating to seed within the scope of this act. It makes it illegal for anyone to hinder or obstruct an authorized person in the performance of his duties under this law. It's also against the law to fail to comply with a "stop-sale" order. The law prohibits the sale of screenings of any kind except with written permit from the Commissioner of Agriculture.

## Hybrid Corn, Tag Regulations Stand

Under the new seed law it is still necessary to register all varieties of hybrid seed corn sold in the state. They also must be tested for maturity by the University of Minnesota Agricultural Experiment Station for at least one year before being offered for sale in Minnesota. The label of these hybrid corn varieties must bear the maturity ratings of the Minnesota Experiment Station in addition to other information.

The use of sales or tax tags on containers of agricultural seed sold in Minnesota, other than cereals, remains the same. A company, however, may use the permit system which provides for the use of quarterly reports instead of sales or tax tags. Permits must be obtained from the Commissioner of Agriculture who reserves the right to reject or revoke the use of the permits.

The new seed law gives the Commissioner the right to issue rules and regulations which he thinks are necessary for proper enforcement.

The enactment of the new seed law is a great step forward in regulating the seed traffic in Minnesota. Good seed is essential to agricultural production and the new seed law should be of great benefit to farmers as well as to legitimate seedsmen.

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# Seed Shopping Tips for 1952

CARL BORGESON\*

WHILE THE ICE may be thick on the pond and the fields blanketed with snow, it isn't too early to plan next spring's seed supply. As with other things you purchase, you'll want seed that has been tested and found reliable.

Improved varieties for the most part are the result of a carefully planned breeding and testing program. Aside from corn, over 30 varieties on our list today are the result of inbreeding, hybridization, and subsequent selection.

Cooperation is the keynote in the development of any new variety. The plant breeder works with specialists in other fields such as plant pathology, entomology, and biochemistry. Since commercial processors are interested in the varieties that are distributed, cooperative tests have been made with them. When a strain has been tested and found desirable, more cooperative work is done with foundation seed-stock organizations, crop improvement associations, and the Agricultural Extension Service. Workers in the various states and the USDA get together periodically to plan over-all programs on common problems. The attack on the new rust strain 15B is a good example of this organized effort.

A new variety can't be developed overnight. Starting with an original cross of two varieties such as B5128 and Redson flax, it takes 12 to 14 years of selecting and testing in greenhouse and field before a variety is developed.

Sometimes a new variety is a stepping stone to something better. For instance, in the fight against stem rust on wheat, the variety Marquillo was first developed and a sister strain of Marquillo was used subsequently in the production of Thatcher wheat. Plant breeders are continually on the lookout for new germ plasm to be used in the breeding program as sources of disease resistance, winter hardiness, insect resistance, and other characters.

## Select from Recommended List

Selecting the right variety for your area is important! Dr. H. K. Hayes, our oat project leader, found a difference of 26 bushels per acre between the high- and low-yielding oats varieties at one station and 35 bushels at another. It takes only about five bu-

shels extra yield per acre to pay the cost per acre for certified seed of a recommended variety.

For about 30 years, the University of Minnesota Agricultural Experiment Station has made yearly variety recommendations to Minnesota farmers. Agricultural workers in surrounding states also have been interested in the varieties on the Minnesota list.

The varieties on this select list must have had at least three years' trial against standard varieties in experimental plots. These trials are made at branch stations and on the fields of farmer cooperators. In addition new strains are exposed to artificially induced disease epidemics at University Farm. Tests of quality are made in cooperation with commercial processors. The results of all these tests are annually placed before crops and soils specialists from University Farm and the branch station superintendents and agronomists. Only after much discussion is a variety accepted or rejected.

Occasionally, after varieties get to the farmer, they may show weaknesses that did not appear in tests; or new disease strains may develop and attack certain varieties. In the long run, however, the recommendation program has paid off for Minnesota farmers. Just one outstanding variety that is adapted to Minnesota, and perhaps to other states, will finance the state's crop improvement program for many years.

Seed certification in Minnesota and many other states is one kind of seed insurance. The Minnesota Crop Improvement Association has adhered closely to the recommended list in its certification program and the varieties certified have either been on the recommended list or have had the backing of the crops specialists.

## New Varieties

Of special interest this year are Lee wheat, Blackhawk soybeans, and Redwood flax.

Lee is a hard red spring wheat that has performed well in the area adapted to spring wheat. Its principal advantage is its resistance to leaf rust.

Blackhawk soybeans are recommended for the Southern and South Central Corn Maturity Zones. The variety stands well, is tall, and produces pods fairly well above the ground.

Redwood flax is a brown-seeded, blue-flowered variety that is immune

## Tips to Check . . .

1. Do your seed shopping early.
2. Avoid untested and unknown varieties.
3. Call your county agent or write to University Farm for information you need.
4. Purchase certified seed. If it is not available, get your seed from a reliable dealer or grower.
5. If the price seems exorbitant, make a few inquiries before buying.
6. Make arrangements for a reasonably early delivery.
7. Good seed comes packaged in sound bags labeled in accordance with federal and state seed laws.
8. Much of the 1951 crop seed will respond to seed treatment. This is a point to check especially this year.
9. Save a pint to a quart of the seed for a file sample. If for any reason you have a complaint, it should be based on an analysis of a representative sample.

to races of rust found in Minnesota. It is moderately resistant to wilt and adapted to any areas in Minnesota where flax can be grown successfully.

Names of growers who have seed of these varieties are available from the Minnesota Crop Improvement Association, University Farm, St. Paul 1, or from your county agent.

One of the newer varieties being sold this year is Branch oats, developed by the University of Wisconsin Agricultural Experiment Station. This variety is very tall and averages about six inches taller and 10 days later than Clinton. It lacks standing ability but yielded well in one year of test.

## Watch Out for Poor Varieties

As usual, odds and ends of varieties are being sold by farm-to-farm salesmen. Sometimes these are new varieties that were produced in other states and are still being tested here. Or, they may be tested varieties that were found unsuitable.

Buying a cheap part for a machine often results in a breakdown and a big repair bill. That isn't good economy. Buying cheap or inferior seed isn't good crop economy. By that, we don't mean to imply that good seed has to be expensive. But shop carefully.

\* Associate Professor, Division of Agronomy and Plant Genetics, in charge of seed increases, University of Minnesota.

# Fit Fertilizers to Crop and Soil Needs

**C. O. ROST\***

THE FERTILIZER grades and ratios recommended for use in Minnesota in 1952 are essentially the same as those recommended in 1951. The grades and ratios recommended are based on a large number of experiments and observations.

While the supplies of raw materials used in making up the various fertilizer grades may vary from year to year, the needs of crops growing on our fields remain essentially the same.

You get yields when there are plenty of plant nutrients in your soil and when plant nutrients are in the right proportion. This proportion differs from field to field, so you need fertilizers in which the different nutrients are in different proportions. This is shown by the fertilizer ratio. Thus, the 3-12-12 and 5-20-20 grades have the same ratio, namely: 1-4-4. For 6-24-12 the ratio is 1-4-2.

When material is scarce, manufacturers tend to produce the grades which are lowest in the material which is in short supply. Thus, if there is a shortage of potash, high-potash fertilizers are eliminated. This permits the manufacturer to prepare for sale a larger number of tons of mixed fertilizers. It may, however, prevent many farmers from obtaining a fertilizer of the correct ratio for their fields.

Certain crops such as small grains have a lower potash requirement than crops like alfalfa, corn, and potatoes. Even in times of shortages it would seem better judgment to fit the fertilizer to the needs of the soil than to

change the fertilizer ratio to fit the supply of raw materials.

In 1952 there will be a shortage of superphosphate and already there has been some discussion of lowering the phosphate content of mixed fertilizers since the supply of potash appears to be better than the supply of superphosphate. A general lowering of available phosphate in the fertilizer will lower its efficiency in proportion to the decrease. In Minnesota phosphate is generally the most needed fertilizer ingredient. It would seem wiser to maintain our present fertilizer grades and ratios and manufacture as much mixed fertilizer as the supply of superphosphate will permit. This should be used wisely to fit crop demands and the nutrient supply in the soil as shown by soil tests.

Wise use of fertilizers is good economy at any time regardless of available supplies of fertilizer. To use fertilizers economically you should consider these factors: (1) the crop to be grown; (2) the supply of available nutrients in the soil; (3) past soil management.

The requirements for different crops are fairly well known. Much less is known about the supplies of available nutrients that exist in the soil of different fields on the same farm. Too often the fertilizer is applied on the field which is least in need of it because the grower is thinking in terms of fertilizing a single crop. He applies fertilizer to the field on which he intends to plant that crop. It would be better long-run economy to fertilize the field most in need of fertilization. Soil tests will reveal which fields already have a good or fair supply of available nutrients and this will release fertilizer for

fields on which the supply is inadequate.

When fertilizer shortages occur many farmers reduce the rate of application to stretch the supply. In general the rates of application of fertilizers used in Minnesota are very modest, and growers should give careful consideration to a general increase in rates of application as soon as fertilizer supplies will permit. A further increase in crop yields generally will result.

Fertilizer grades and ratios recommended for Minnesota are listed in Folder 145 of the Minnesota Agricultural Extension Service. You may obtain a copy from your county agent or by writing to the Bulletin Room, University Farm, St. Paul 1.

## Feed Talks Slated

Feed, seed, and fertilizer topics will occupy important places on the program for Farm and Home Week, to be held on the St. Paul Campus of the University of Minnesota, January 15-18.

Wednesday, January 16, will be Crop Improvement Day, with reports to be given by University staff members and others on such topics as varieties of small grains and oil crops, drying of grains, stem rust, plant breeding, corn maturity ratings, and forage crops.

Feeding will be dealt with at sessions on livestock production, and reports on fertilization are scheduled to be discussed at soil management sessions on other days of the week.

You may obtain a printed Farm and Home Week program by writing to the Office of Short Courses, University Farm, St. Paul 1, Minnesota.

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## In This Issue - - -

- TURKEY TRIALS SHOW FEEDING EFFECTS by H. J. Sloan, G. M. Briggs, and R. W. Berg
- NEW SEED LAW SAFEGUARDS BOTH FARMER AND SEEDSMAN by O. A. Ulvin
- SEED SHOPPING TIPS FOR 1952 by Carl Borgeson
- FIT FERTILIZERS TO CROP AND SOIL NEEDS by C. O. Rost

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