MINNESOTA FEED SERVICE

University of Minnesota Agricultural Extension Service, St. Paul — Summer 1964

Swine Testing Makes Progress in Minnesota

I. T. Omtvedt

"Performance tested" is rapidly becoming a common, as well as meaningful, term among Minnesota swine producers. In 1957 when the first Minnesota Swine Evaluation Station opened at Austin, few producers realized the impact this program would have on their enterprise. Some purebred breeders were aware that station testing could aid in upgrading their herds, but the station attracted little interest among commercial producers, who supply approximately 90 percent of our slaughter hogs.

Fortunately this picture has changed in the past 7 years. Today both purebred and commercial swine producers have a growing appreciation of the real value of a good swine testing program.

What is the value of station testing? The market pigs fed from weaning to 200 pounds at the testing station and then slaughtered and completely evaluated, offer breeders an excellent opportunity to supplement their herd selection and breed certification programs with hard-to-get records on several important traits.

Feed efficiency, growth rate and carcass desirability (length, backfat thickness, loin eye area, and percent ham and loin) are obtained on each sire progeny group of four pigs. These traits are economically important and have moderate to high heritabilities. This means it is financially sound to consider them in the breeding program, and selection for these traits can result in improvement in the overall performance of the herd.

Most cooperators in the testing program use these records as a "progeny test" on their herd boar or as a "sib test" to select brothers and sisters to the tested pigs. In both instances these records are valuable tools for selecting the "best" breeding stock available.

It is possible to go backwards in a breeding program, and using the wrong boar is the easiest way of doing it. Performance information on an individual *does not* make him any better than a boar without records, but these records are an indication of his real breeding worth. The traits that need the most emphasis in a breeding program vary with herds. Most attention should be devoted to traits needing the greatest improvement in the individual herd.

All too often we hear the sad tale of a breeder paying big money for a "great" new herd boar only to find that he did not "nick" well with his sow herd and the resulting pigs were not as good as the pigs out of the old boar. This points out the value of (1) testing new breeding stock before they are used too heavily in the herd, and (2) the importance of keeping the old herd sire, who has already proven his true breeding value, in the herd until the new boar has been adequately tested.

Successful breeders have found it a sound practice to enter a sample of pigs out of all new herd boar prospects in the test station to check their real breeding worth before going "whole hog" in using them in the herd. They also have learned that test station records are most effective when used as a supplement to a well planned on-the-farm testing program where a larger percentage of the entire herd can be evaluated.

A quick glance at Minnesota Swine Evaluation Station records shows that testing brings results. The following table gives the overall average performance at 3-year intervals since the program was initiated. With the exception of a slight increase in the number of days required to reach 200 pounds, improvement has been achieved in all traits.

Although this table gives only overall average performance for all breeds tested at the stations, many breeders have used station records effectively to make substantial improvement in their individual herds during this same period. Commercial hog producers are also beginning to cash in on this program by demanding performance in-

Minnesota swine testing stations summary

Year	1957	1960	1963
Number barrows tested	27	659	668
Age at 200 pounds (days)	146	149	148
Pounds feed/cwt. gain	317	318	302
Carcass length (inches)	29.2	29.9	29.6
Backfat thickness (inches)	1.74	1.56	1.52
Loin eye area (square inches)	3.58	3.72	4.06
Ham and loin (percent of liveweight)	23	24	26

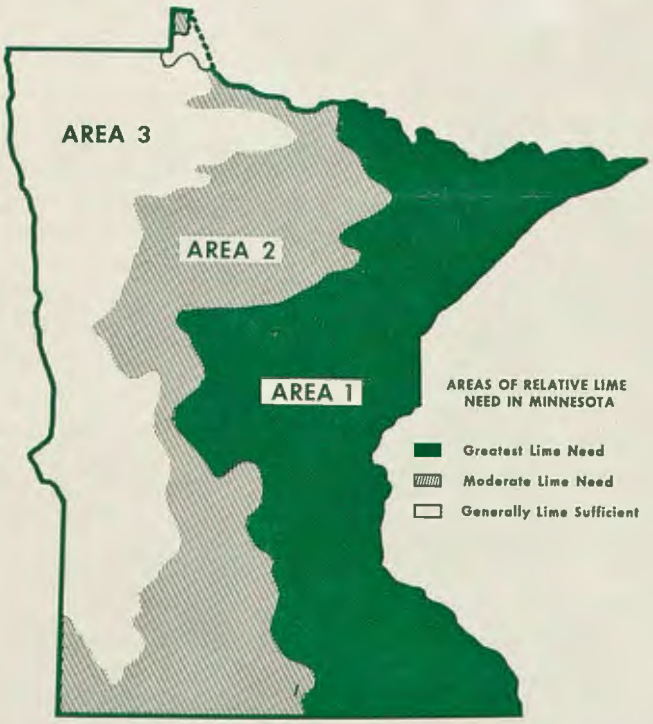
I. T. Omtvedt, former associate professor and extension animal husbandman at the University of Minnesota, is now associate professor, Department of Animal Science, Oklahoma State University, Stillwater.

formation on the boars they buy for their herds. This gives them a much better idea as to what can be expected from the boar than if only "looks" had been considered.

Although these changes indicate that swine testing is gaining momentum after a rather slow start, their real contribution is still to be realized by the producer. In the future, swine performance records will be as important to swinemen as DHIA records are to dairymen.

Information about the Minnesota swine testing program may be obtained by writing Extension Animal Husbandry, 101 Peters Hall, Institute of Agriculture, St. Paul, Minnesota 55101. Also, see Extension Bulletin 306, "Improving Swine Through Breeding," available from your county agent or from the Bulletin Room, Institute of Agriculture, St. Paul, Minnesota 55101. No charge for single copies.

When Lime Doesn't do the Job . . .



Chances are it isn't the limestone; method and time of application have a lot to do with results.

Merle Halverson

Although the benefits of liming are generally well known, only about 16 percent of the annual lime tonnage need on Minnesota soils is being met. And much of the relatively small amount of lime used is not applied effectively. This situation clearly calls for (1) greater encouragement of liming in lime deficient areas, and (2) greater attention to method of application, time of application, and limestone quality.

Method of Application

The split-application method — half applied before and half after plowing — has long been recommended. However, this requires an extra trip over the field, and because of the inconvenience is not widely followed. So to learn more of the effects of different application methods, Wisconsin researchers compared three methods of applying 5 tons of lime per acre to an acid silt loam soil before seeding down to alfalfa. Each application was worked into the soil by two discings. At the end of the third hay production year the pH of 1-inch soil increments to a depth of 6 inches was determined. These are the findings:

1. Lime applied and disced in *before* plowing corrected soil pH to a 6-inch depth in much the same manner as the split-application method. Four years after application, lime applied and disced in *after* plowing showed little effect on soil pH at depths below 3 inches.
2. Alfalfa stand counts made the spring of the second production year showed no differences among the various methods of application.
3. Chemical analysis of hay from both cuttings of the first 2 production years showed no differences in composition among the application methods used.
4. Taken over the 3-year period, lime applied and disced in *after plowing* resulted in production of one-fourth ton per acre *less* hay per year than where all the lime was applied *before* plowing. *There was no difference in yield between the split-application and applying all the lime before plowing.*

Over the past two seasons, C. J. Overdahl, extension soils specialist, and R. D. Munson, American Potash Institute agronomist, used indicator solutions to examine pH levels of recently limed Minnesota soils carrying alfalfa stands. In far too many cases, poor stands and inferior growth are associated with inadequate vertical distribution of lime in the soil profile. In many instances, pH levels suitable to alfalfa growth have been restricted to the top inch — or to a narrow zone at plow depth (about 6 inches). In such cases it is apparent that the farmer is not accomplishing proper mixing of lime with the soil.

Farmers, lime vendors, and fertilizer dealers stand to lose in equal measure when a poor liming job stands in the way of results. The importance of discing lime thoroughly into the soil before plowing cannot be overemphasized.

Time of Application

It is common knowledge that it takes time for lime particles to dissolve and establish zones of "sweet" soil favorable to young legume growth. But few are aware that time can also be used as a "lever" to encourage a good job of incorporation. Here's how:

Farmers applying lime to acid soils for the first time are often inexperienced in its use. Frequently they have

The late Merle Halverson was an instructor and extension soils specialist. Mr. Halverson died of a heart attack Monday, August 17, while returning from Austin, Minn., where he had participated in a meeting of county and state extension personnel concerning drought conditions in southern Minnesota.

imperfect knowledge of the many factors that can enter in to bungle the job.

Lime disced in and plowed down before planting the crop that precedes legume establishment is exposed to extra mixing through cultivations and plowing the year before the legume is seeded. And the extra 12 months time can markedly increase solution of the larger lime particles. It all adds up to customer satisfaction at a time when it is most important—his first experience!

We strongly encourage dealers and vendors to get lime on 12 to 18 months ahead of intended legume establishment when acid soils are limed for the first time. ACP cost sharing in Minnesota applies when liming is done up to 18 months before seeding a legume crop.

Limestone Quality

Purity and particle size determine limestone quality.

In Minnesota, as in most states, purity is measured in terms of calcium carbonate equivalent (C.C.E.), or the amount of limestone needed to equal one unit of pure calcium carbonate in neutralizing power. ASC regulations specify 80 percent C.C.E. as the minimum acceptable purity. The hard dolomitic stones of southern Minnesota are uniformly high in purity, averaging about 89 percent.

Minnesota's ASC regulations specify that limestone shall be ground finely enough to enable not less than 80 percent by weight to pass through an 8-mesh sieve. In addition, the C.C.E. multiplied by the percent by weight passing through an 8-mesh sieve must equal at least 0.72. This means that either purity or fineness or both must be sufficiently higher than 80 percent to enable their product to be at least 0.72 C.C.E.

The question of whether sieve sizes smaller than 8-mesh might better enhance limestone effectiveness has been thoroughly investigated. An Indiana researcher summarized the results of 18 widely distributed experiments in which amounts of limestone going through single sieves of differing sizes and/or differing size fractions were compared. In 16 of the 18 experiments, larger yield increases were obtained for the finer lime mesh sizes.

In general, limestones of which less than 25 percent would pass through a 60-mesh sieve were less effective than those ground so finely that all passed through 100-mesh sieves. Minnesota limestones show considerable variation in this regard, but of 71 samples analyzed in 1962, an average of 35 percent passed through 60-mesh sieves.

Indiana data from several long-term experiments indicate the amounts of limestone of several ranges in fineness needed to give equivalent yield increases:

Percent passing a 60-mesh sieve	Equivalent amounts of limestone, tons per acre
41-100	1.00
31-40	1.25
21-30	1.50
10-20	2.00

When compared with the known quality characteristics needed for optimum results, Minnesota limestones are good. Their purity is excellent. Fineness of grinding could be improved in some cases.

THE BENEFITS OF LIMING

- **Lime furnishes calcium and magnesium for plant growth.**
- **Lime makes nitrogen and phosphorus more available to growing plants.**
- **Lime promotes the growth of favorable soil bacteria in acid soils.**
- **Lime prevents soil acids, aluminum, manganese, and iron from becoming toxic to plants.**
- **Lime improves the physical conditions of many soils by promoting a crumblike structure.**
- **Lime may help cut down on soil and water losses by improving soil tilth.**
- **Lime lessens the possibility of insect and disease damage by promoting vigorous plant growth.**

University Announces Distribution Policies for Seed Stocks

Policies for distribution of seed of eight crop varieties have been announced by the University of Minnesota's Agricultural Experiment Station.

The distribution involves seed of Summit flax, Lodi oats, Harosoy-63 soybeans, Mingren sunflowers, Empire, Turghai, and White-Wonder millets, and Crim wheat.

Seed of these varieties was distributed by the experiment station in cooperation with the County Seed Distribution Committees. The 1964 crop was grown under an agreement between the growers and the station.

Carl Borgeson, secretary of the Experiment Station Seed Distribution Committee, says policies for further distribution of seed by the growers are as follows:

1. None of the seed will be recalled by the station. Persons interested in registered or certified seed may obtain it directly from growers in their counties or in other counties. Seed directories are available from county extension agents and the Minnesota Crop Improvement Association.
2. No maximum prices will be set. The eight varieties are not in short supply, and this should govern prices that can be charged.
3. Growers are to reserve 90 percent of their crop for other growers in Minnesota until November 1 for certified seed, and until December 1 for registered seed. Certified seed growers are to be given preference in the sale of registered seed.
4. Growers must make every effort to complete seed certification of all new varieties released in 1964.

MINNESOTA NUTRITION CONFERENCE 1964

The twenty-fifth annual Minnesota Nutrition Conference will be held September 14-15 at the North Star Ballroom, Student Center, University of Minnesota, St. Paul Campus.

The conference is sponsored by the University of Minnesota, the American Feed Manufacturers Association, the Northwest Feed Manufacturers Association, and the Northwest Retail Feed Association.

Nitrate Poisoning: More of a Problem in Dry Weather

While soil fertility is a must for profitable crop production, high nitrogen fertility can have some adverse effects during drouth, according to Curtis Overdahl, extension soils specialist, and J. M. MacGregor, soils researcher at the University of Minnesota.

One possible result is nitrate buildup in plant tissue, which may cause harmful but costly effects—such as drop in milk production, abortion, or, in extreme cases, death of the animal.

The problem is most likely to occur under extremely dry weather conditions, such as occurred in many areas of Minnesota this summer. A soil may be high in available nitrogen as a result of many factors. Nitrogen may have built up through manure applications, through use of commercial fertilizer, or through regular use of high nitrogen-fixing legumes, such as alfalfa or sweet clover.

When a soil is high in nitrogen from any of these sources, accumulation of dangerous amounts of nitrate is more likely in dry weather.

The soils men say a long, severe drouth may not be as harmful as a shorter drouth period. In the first case, the crop could be damaged to such an extreme so early in the year that it may have little opportunity to take up much nitrogen.

In a shorter drouth period, however, plant growth may be slowed, but not stopped. Here is where danger begins. The plant is still able to take up nitrogen, but it is slow in converting nitrates to protein compounds within the plant.

Nitrate accumulation, then, is essentially a problem of incomplete conversion by the plant.

The most danger from nitrate accumulation occurs with direct feeding to cattle. Where farmers know their soil is well supplied with introgen—no matter what the source—some caution in direct feeding is advisable.

The hazard should not be as great on many sandy textured soils, or other soils known to be low in nitrogen.

For more information, see "Handling Drought-Stricken Corn to Prevent Nitrate Poisoning," animal husbandry fact sheet No. 8, available from your county agent or from the Bulletin Room, Institute of Agriculture, St. Paul, Minnesota 55101.

Institute of Agriculture Calendar

September

8-10	Dairy Products Institute, St. Paul Campus.
11	Horticultural Field Day, West Central School and Experiment Station, Morris.
12	Horticultural Day, Northwest School and Experiment Station, Crookston.
14-15	Shade Tree Maintenance Short Course, St. Paul Campus.
14-15	Minnesota Nutrition Conference, St. Paul Campus.
15	Corn-Soybean Field Day, Southwest Experiment Station, Lamberton.
16	Corn-Soybean Field Day, Southern School and Experiment Station, Waseca.
17	Graduate Veterinarians' Conference, St. Paul Campus.
19	Fruit Breeding Farm Visitors' Day, University Fruit Farm, Excelsior.
22	Corn-Soybean Field Day, Agricultural Experiment Station, Rosemount.
24	Beef Cattle Grassland Field Day, Rosemount Agricultural Experiment Station.
24	Red River Valley Beef Feeders Clinic, Northwest School and Experiment Station, Crookston.
24	Garden Club Day, St. Paul Campus.
28-Oct. 1	Junior Livestock Show, South St. Paul

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ROLAND ABRAHAM, acting director
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