MINNESOTA FEEDSERVICE

University of Minnesota Agricultural Extension Service, St. Paul — December, 1958

Crop List Changed for 1959 Recommendations

THE UNIVERSITY OF MINNESOTA Agricultural Experiment Stations and Extension Service and the Minnesota Crop Improvement Association revised the list of recommended field crop varieties at the recent annual varietal recommendations conference. Lists and descriptions of varieties "recommended," "not adequately tested" and "not recommended" will appear in Extension Molder 22, "Varieties of Farm Crops," revised annually and available in January, 1959.

Two varieties will be recommended for the first time in 1959. They are Burnett oats and Comet soybeans. Burnett was developed and released by the Iowa Agricultural Experiment Station and is midseason in maturity. It is later in maturity and yields more than Minhafer, but is lower in yield and matures earlier than Ajax.

Comet soybeans, developed in Canada, mature 1 or 2 days earlier than Ottawa Mandarin. In southern Minnesota, this variety has given outstanding performance compared to other early-maturing varieties. However, its performance has not yet measured up to other early-maturing varieties in Central and North Central Minnesota. Therefore, it is recommended only for the Southern one-third of the state.

Folder Tells Complete Story on Crop Varieties

Minnesota Agricultural Extension Folder 22, "1959 Varieties of Farm Crops," is now being revised and will be available shortly. You can get copies from your county agricultural agent or from the Bulletin Room, University of Minnesota, Institute of Agriculture, St. Paul 1.

Another variety, Arny flax, will be added to the list, but was actually authorized for naming, release, and recommendation at the 1957 conference. It was developed cooperatively by the

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University of Minnesota Agricultural Experiment Station and the U. S. Department of Agriculture. It was not included in the 1958 issue of Extension Folder 22 because it was not named in time for inclusion and because of arrangements for simultaneous release with the USDA and other cooperating states.

Five varieties, listed in 1958 as "not adequately tested" were moved to the "not recommended" list. These were Scotian, Shield, and Simcoe oats; Sangaste rye and Russel bread wheat.

Nine Varieties Dropped

A final group of varieties was dropped from the "recommended" list. They are Branch, Minland, and Sauk oats; Blackhawk and Renville soybeans; Peatland and Vantage barley; Midland red clover, and Advance sunflowers. The oats, soybean, barley, and sunflower varieties were removed from the recommended list because other varieties of the same maturity groups have given higher yields, better quality, or more disease resistance. Midland red clover is no longer recommended because the plant-breeder seedstocks are not being maintained.

The list of recommended varieties is based on several years of field tests around the state. These tests are conducted by the Minnesota Agricultural Expermient Stations at St. Paul, Waseca, Morris, Crookston, Grand Rapids, Duluth, Rosemount and in farmers' fields in southwestern Minnesota, northern Minnesota, and other parts of the state.

The tests are conducted so that growing conditions are controlled as nearly as possible and are the same for all varieties. All varieties have an equal opportunity to exhibit their yielding ability and other characteristics. Within certain limits, differences can be attributed to the varieties themselves rather than to other factors. The usual minimum testing period before recommendation is 3 years.

The varieties are evaluated for yield, winterhardiness, disease and insect resistance, ability to compete with weeds, standability, and other factors.

They are also tested in greenhouses, disease nurseries, and laboratories for disease resistance, insect resistance, and quality. In crops where quality is important in marketing the crop, the factors which comprise the market quality must be thoroughly evaluated in special laboratory tests before a variety can be released, recommended, or both.

The recommended varieties of field crops for 1959 are as follows:

Oats: Ajax, Andrew, Burnett, Garry, Minhafer, and Rodney. **Wheat:** Lee and Selkirk, spring bread wheat; Langdon and Ramsey, Durum; and Minter, winter wheat. **Barley:** Forrest, Kindred, and Traill. **Rye:** Adams, Caribou.

Flax: Arny, B5128, Bolley, Marine (for use only when late planting is necessary), and Redwood. **Soybeans:** Acme, Capital, Comet (for southern one-third of Minnesota only), Chippewa, Flambeau, Grant, Harosoy, Norchief, and Ottawa Mandarin. **Alfalfa:** Ranger and Vernal. **Red Clover:** Dollar and Wegener. **Biennial Sweet Clover:** Evergreen and Madrid.

Bromegrass: Achenbach, Fischer, and Lincoln. **Birdsfoot Trefoil:** Empire. **Sudangrass:** Piper. **Timothy:** Itasca and Lorain. **Kentucky Bluegrass:** Park. **Field Peas:** Chancellor and Dashaway. **Sunflowers:** Arrowhead.

Varieties on the "recommended" list must be superior to other varieties of the same maturity class in one or more respects and not significantly inferior

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Drill Box Survey Shows

Seed Inspection Problems

MINNESOTA FEED SERVICE

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Feed Service Committee—Phil Tichenor, chairman; Rodney Briggs; William Flemming; Lester Hanson; Hal Routhe; Harold Searles; Charles Simkins and Harold B. Swanson. Earl Brigham, editorial assistant for the committee.

Up to 1950, it was generally thought that by inspecting only the seed handled by dealers, the state seed inspection program in Minnesota would be effective. Now, however, it's known that much seed is sold from farmer to farmer—seed which also requires inspection. We've asked O. A. Ulvin to background this problem and report the studies leading to the recent findings. Mr. Ulvin is supervisor, section of seed inspection, for the Minnesota Dept. of Agriculture, Dairy and Food.

O. A. ULVIN

Seed inspection by public agencies began in 1913 in Minnesota based on establishment of a seed laboratory for analysis of samples submitted by farmers and dealers for purity, germination, and weed seed content.

In 1927 a Pure Seed Act was enacted which established the basis for a seed inspection program throughout the state. In 1940, the state enacted a Seed Tag Law which provided fees for seed inspection purposes and presented an opportunity to establish an effective program.

Feed Dealers School Will Be January 5-6

The annual Training School for retail feed dealers will be Jan. 5-9 at the St. Paul campus of the University of Minnesota.

The event will cover feeding problems in poultry, swine, beef and dairy cattle and other phases of feed retailing.

Anyone in the feed business is eligible for the school. For more information, write the Director of Agricultural Short Courses, University of Minnesota, St. Paul 1. Program chairman is Harold Pederson, extension agricultural economist.

In 1951 a survey was made of 1,438 Minnesota farmers. They were asked what kind of seed they planted and where they got it. Their answers showed that much of the seed planted, especially cereals other than corn, was being produced by the farmer himself or purchased from a neighbor.

This survey showed that to conduct an effective seed program in Minnesota, it would be necessary to reach these other sources of seed and determine the quality of it.

The Minnesota Department of Agriculture has reported analysis of 2,733 samples of small grain, grass, and legume seeds taken directly from farmers' drill boxes at planting time during 1953, 1954, and 1955.

More than 85% of small grain seed was produced by the farmers who planted it or by their neighbors. Dealers furnished less than 10%. About 20% of the seed grain planted could not have been offered for sale in that state without violating the state seed law.

Nearly 6% of the 1953 samples contained over 1% weed seeds. Twenty-one percent of the 1955 samples contained noxious weed seeds. Only 17% of the legume and grass seed planted that year was produced by the farmers who planted it. However, 55% of the farmers' own seed could not have been sold lawfully.

Nearly 20% of the small grain in 1955 had been purchased from local dealers. Six samples out of 96 collected violated the seed law. Of 310 samples of home grown seed, 74 were in violation.

Similar surveys have been conducted in other states. From them, the following observations may be made:

1. Many farmers have no knowledge concerning the viability of the seed they are planting. South Carolina investigations showed that only 15% of the farmers had made purity and germination tests. In Nebraska, only about 20% had made germination tests.

2. Farmers generally used their own seed for planting small grain or got it from neighbors. In Minnesota, only 6% of the oats, 8% of the barley, 4% of the rye, and 10% of the wheat was purchased from local retail dealers. The greatest opportunity for improvement, therefore, lies in improving the quality of home grown seed.

3. An overwhelming number of the samples contained excessive amounts of weed seeds. These include noxious weed seeds, both prohibited and restricted. North Dakota found that 175 samples of wheat seed, or 45% of the total, contained 100 weed seeds in every pound and averaged 375 weed seeds per pound.

4. Custom cleaning plants do the best job of removing weed seeds and preparing seed for planting. Farm cleaning generally is inefficient. Ontario found that 71% of the custom-cleaned seed graded No. 1 compared to 45% of the farm-cleaned seed. The services of special processing plants are available to farmers and in many instances are being used.

5. Farmers are variety-conscious and eager to obtain new and superior varieties. In Nebraska, 80% of the farmers surveyed were using recommended varieties. This finding was in marked contrast with the results of observations thirty years ago.

6. Certified seed, with the exception of alfalfa, constitutes, less than 5% of the total found in these surveys. It is used by the farmer chiefly for the purpose of obtaining new varieties.

We feel that the seed dealers can be a very effective force in this program. First, they contact many farmers and understand their problems. Secondly, if this information is properly relayed to the farmer, we believe the dealer would profit, inasmuch as he is one of the few sources of good, clean, quality seed.

We also feel that any effort and money spent by seed dealers in getting this information to farmers would be very effective in helping a seed inspection program. This should benefit the dealer himself through increased sales of quality seed.

There have also been recommendations made in Minnesota concerning a screening law, limiting the amount of weed seed permissible in screenings and grain sold for seeding purposes. This seems very desirable, inasmuch as indications are that there is as much weed seed being spread through these sources as through seed itself.

There is also the possibility of a strong enforcement program becoming necessray among farmers themselves, but the first desirable step is to get this information across to the farmers. There is much work to be done in this field and future surveys will have to determine the course of action to be followed.

Fertilizer: Which Form?

R. C. ANDERSON

TESTS MEASURING yield effects of solid, liquid, and gaseous forms of commercial nitrogen fertilizers on corn were conducted on several different soil types in West Central Minnesota during 1958.

Commercial fertilizers used were: ammonium nitrate, 33-0-0; urea, 45-0-0; nitrogen solution, 28-0-0; nitrogen solution, 41-0-0; and anhydrous ammonium, 82-0-0.

Treatments were made at two rates of 40 and 80 pounds of nitrogen per acre, with all applications in a band 6 inches deep, midway between 40-inch rows. All fields received a basic broadcast treatment of 0-80-80 and a broadcast treatment of Randox, a pre-emergence anti-weed chemical. One variety of corn was used on all fields.

To make this study, soils scientists and engineers designed a fertilizer machine which would calibrate and deliver the three forms of fertilizers on plot areas. The machine is designed to permit variable placement of all forms of fertilizer including broadcast, sidedress, or deep placements. Planting attachments for corn and small grains are mounted on the machine. This provides for uniform placement and planting of crops tested on all treatments.

The results of the nitrogen study showed a slight variation in the corn yield response from different nitrogen carriers on different soil types. The significance of this trend has not yet been determined. Chemical analyses of total nitrogen of the leaf tissue and the grain samples will soon be made in an effort to correlate the difference in yield with plant uptake of the added nitrogen.

Liquid vs. Solid Starter Fertilizer Trials in 1958

We also compared the effect on corn yields of liquid versus solid starter. The treatment was 12-36-18 per acre. The solid treatment consisted of 8-24-12 commercial starter fertilizer and the liquid treatment came from a 5-15-8 commercial liquid fertilizer. Both treatments were applied with the experimental fertilizer machine to the side and 2 inches below the seed. One variety of corn was used on all fields. A broadcast pre-emergence treatment of Randox was applied for early weed control.

Table 1. Effect of solid versus liquid starter fertilizers in 1958 on average corn yields

Treatment	Soil type		
	Barnes	Webster	Clarion
	(bushels per acre)		
Liquid 12-36-18	68	95	80
Solid 12-36-18	64	93	78
Check	62	82	72

The results obtained from yield data are summarized in table 1. The liquid treatment shows a slight, but probably not significant, advantage in all fields tested.

R. C. Anderson is a graduate student in the Department of Soils.

Dairy Calf Feeding

H. R. SEARLES

THERE IS no one best way for everyone to raise dairy calves. There are several methods, both in feeding and management. They all include a few essentials for success.

1. The calf needs to get a start on colostrum milk. It is heavily loaded not onyl with extra nutrients but also vitamins and antibiotics. It is almost a necessity ot start the new calf off.

The feeding program may differ after the 3rd day.

2. The calf needs to be kept in a clean dry place free from drafts for a few weeks.

3. After the first week, the calf needs plenty of the best hay available.

These are not all the needs but they are generally the ones included in all good systems.

The calf should be dropped in a clean dry stall and its navel should be dipped in tincture of iodine. It can be left with the cow for the first three days to nurse at will or it can be removed to a clean dry single pen and fed by hand. Hand feeding rate should be about 1 pint of colostrum for each 10 pounds live weight in two feeds.

The common practical method is to continue whole milk feeding for four to six weeks. There is little to gain from using a substitute product for the whole milk although they are available.

The first few weeks are the critical period. If one is having trouble with scours and sickness in calves, fortifying the ration with vitamins A and D and antibiotics will often help. Both vitamin A and aureomycin have increased gains in some trials, but usually these gains have not carried over beyond calfhood.

Hay, the best available, should be given to calves at about a week of age. A grain or concentrate is needed at about the same age. The calves should be eating some quantity of each by the end of the whole milk period or from 4 to 6 weeks of age.

When skim milk is available the calves can be gradually put on skim milk in place of whole milk. The grain ration can be a simple mixture of

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1959 VARIETY LIST

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in any important characteristics. Varieties released by other experiment stations in the United States and Canada or introduced into Minnesota from other sources are placed in the "not adequately tested" category until they can be evaluated. After a period of adequate testing—usually 3 years or more—these varieties are either recommended or not recommended, depending upon their performance in trials. A variety may be moved from the "recommended" to the "not recommended" category when it becomes unsatisfactory for any reason or when new superior varieties are developed or introduced.

The University does not recommend specific corn hybrids. However, many hybrids are tested by Experiment Station scientists each year and are evaluated for maturity, yield, standability, and disease resistance. The results of these tests are reported in Miscellaneous Reports 20 and 28. These reports, revised annually, are available from County Extension Offices or from the University of Minnesota.

In selecting varieties to plant, the farm must consider relative maturity, yield potential, disease resistance, quality, and other factors. During the summer of 1958, when plant diseases such as cereal rust were not severe, the advantages of rust-resistant varieties were not as clear-cut as when these diseases are more of a problem. However, it is still necessary to plant disease-resistant varieties as an "insurance" measure. In another year the disease problem may again be great. Scientists cannot predict with certainty when disease losses will be severe.

Soil Test Summaries

J. GRAVA

Soil test summaries are important to the lime and fertilizer industries. They point out areas of greatest need for specific products.

The summaries are prepared by adding up the number of samples in the various soil test categories (low, medium, high, etc.) and calculating percentages. The summaries show deficiencies of each nutrient on a county basis. They are also prepared on the basis of soil associations. The areas are separated by natural boundaries and usually include similar soil types. Summaries consist of tables, diagrams, or maps which characterize the general soil fertility levels of different areas in the state.

Table 1 indicates the relative fertility levels of soils in three entirely different soil association areas.

The greatest need for lime is in the Zimmerman - Isanti - Peat (ZIP) area where 75 percent of the samples tested in pH less than 6.2. One-third of the samples from the Clarion-Nicollet-Webster (CNW) area need liming. Actually the greatest need for liming is in the eastern portion of this area; the need diminishes in a westward direction. The Fargo-Bearden (FB) area, having alkaline soils, has no need for lime.

Table 1. Characteristics of soil samples from three soil associations in Minnesota

Soil test	Soil Association: Zimmerman-Isanti-Peat	Clarion-Nicollet-Webster	Fargo-Bearden
	(percentage of samples)		
1. pH less than 6.2	75.0	35.0	1.2
2. "Adsorbed" phosphorus content:			
Low & medium	5.6	60.0	50.3
High	94.4	40.0	49.7
3. Exchangeable potassium content:			
Low & medium	94.4	56.0	8.8
High	5.6	44.0	91.2

The ZIP soils are primarily in Anoka, Chisago, Isanti, and Sherburne counties. The FB area is along the Red River between Traverse and Kittson counties, and CNW soils cover a wide area of South Central Minnesota.

The summaries point out that the greatest need for phosphorus is in the CNW and FB areas. They also point out the relatively high availability of phosphorus encountered in the ZIP soils.

In the ZIP and the FB soils we have the two extremes in potassium availability. The greatest need for potassium is on ZIP soils, while the FB soils generally are well supplied with this nutrient. The CNW soils are somewhat in between these extremes.

Organic matter test summaries indicate moderate to high availability of *nitrogen* for CNW and FB soils. The majority of the ZIP soils generally are low in organic matter content and, therefore, in available nitrogen.

On the basis of this information the following are typical examples of the recommendations of plant nutrients that can be made.

Table 2. The amounts of plant nutrients recommended for production of good corn yields on an average soil*

Soil association	Plant nutrients recommended: N	P_2O_5	K_2O
	(pounds per acre)		
ZIP (Isanti County)	80	20	60
CNW (Watonwan County)	60	40	40
FB (Wilkin County)	60	60	0

* According to "Guide to Fertilizer Use in Minnesota," Ext. Bulletin 277, Mimeo to county agents, modified April 1958.

Table 3. The amounts of plant nutrients recommended for production of alfalfa seeded without companion crop on an average soil*

Soil association	Plant nutrients recommended: N	P_2O_5	K_2O
	(pounds per acre)		
ZIP (Isanti County)	10	30	90
CNW (Watonwan County)	0	60	60
FB (Wilkin County)	0	90	0

* According to "Guide to Fertilizer Use in Minnesota," Ext. Bulletin 277, Mimeo to county agents, modified April 1958.

Soil test summaries are helpful in establishing a certain *sequence of priority* of lime and nutrient needs in an area. For the ZIP soils, for example, the sequence would be: (1) lime, (2) potassium, (3) nitrogen, and (4) phosphorus.

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DAIRY CALF FEEDING

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coarse ground corn and whole or ground oats. Many dairymen find whole oats very satisfactory.

When a farmer sells whole milk, the simple way is to use a skim milk replacer concentrate. He can use one of the many good ones on the market, or he can use a home mix.

A satisfactory calf meal is: 40 lbs. ground corn; 30 lbs. ground oats; 10 lbs. bran; 10 lbs. oil meal; 10 lbs. dry skim milk powder; 1% trace mineral salt and 1% bone meal. Up to about 4 pounds of this concentrate can be fed daily, free-choice. The calves should also have plenty of good hay at all times and it needs to be changed daily.

After 6 months of age, plenty of good hay and a few pounds of the dairy cow ration will grow good calves.

Silage can be fed to calves, but there is little point in going to the trouble. They will do just as well on the hay. Provide water at all times.

Trace mineral salt and bone meal should be self-fed, half and half.

After the calves go off milk and on to dry feed, they can be run together in pens that are kept clean and dry. It is best to keep the calves of the same age together as far as possible.

When calf hood diseases are present, antibiotics and additional A and D vitamins are needed. Consult your veterinarian and set up a program of management to keep them under control.

A clean dry draft-free pen is much more important to a young calf than a warm barn.

If you are having trouble with calfhood diseases, find out the trouble and correct it. Often, calf pens in the damp corner of the barn can be the trouble. Careful calfmanship the first few weeks is all important. No amount of medication can replace good wholesome feed, and clean dry draft-free quarters.

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