The Northwest Experiment Station News

Published by the Northwest Experiment Station of the University of Minnesota

Crookston, Mn. JANUARY, 1986 VOLUME 14, NO. 1

New Dairy Facility

Over the past two years the Northwest Experiment Station, (NWES) in cooperation with other University of Minnesota groups, has reviewed the dairy program at Crookston. Because this review and program is very large in scope and quite complex in nature, this article is to summerize why, how, and when a new dairy facility will be constructed at the Station.

WHY

The University buildings, (in this case the NWES dairy barn) are used by the public (college students, dairy farmers, extension and tour groups). Therefore, special consideration must be given to the "public" safety.

A major portion of the current facility is structurally unsound for public safety and it also lacks handling, weighing, laboratory and instructional areas, as well as ventilation necessary for proper animal health. The structural deficiency was brought to the forefront in the fall of 1983 when a severe storm removed approximately one quarter of the shingles on the 1906 section of the present facility. Inspection of the roof boards and rafters revealed that without major repairs in these areas, reroofing would be a waste of time and money. Furthur inspection showed major problems with the stability of the sidewalls in this structure. It was at this time that the staff and superintendent of the Northwest Experiment Station moved the dairy facility to the top of the major capital improvement list in order to maintain the current research program at the Station.

HOW

In the spring of 1984, the Minnesota Legislature approved planning money for the addition and renovation of the dairy facilities at Crookston. The decision to request this planning money came after an initial meeting between the superintendent of the Northwest Experiment Station (Dr. Larry Smith) and the provost of the Technical College (Dr. Stanley Sahlstrom), and later meetings with Dr. George Marx, dairy scientist, and Dr. Gary McVey, chairman of the Agriculture Division, area legislators and dairymen throughout northwest Minnesota. The Crookston dairy facility then became part of the overall University of Minnesota's capital improvement request to the Minnesota Legislature in 1985.

To acquaint the dairymen of northwest Minnesota about the request, experiment station, college, and development staff spoke at 26 major dairy events in northwest Minnesota during the winter months. From these meetings a Dairy Support Committee chaired by Roger Odegaard was formed. This committee assisted in communicating the dairy needs of northwestern Minnesota to the Legislature. In June of this year, the Legislature approved funding of the Dairy Research and Teaching Facility.

WHEN

During the past year, a committee from Crookston and St. Paul have been working with an architect on developing plans for the facility. The plans are now essentially complete and are being submitted to the Physical Planning Office of the University for approval. The plans not only include research needs but also education (Technical College) and dairy promotional (Extension) needs. If the current schedule can be maintained, construction of the facility should begin April 15.

RESEARCH, TEACHING, EXTENSION, PROMOTION

These were the essential elements that were considered in the development of the facility plans. While the Minnesota Legislature provided funding for the backbone of the facility, additional private funds are needed to complete the objectives outlined above. The Dairy Support Committee is looking to the dairy producers and industry to complete this commitment to ensure a strong dairy industry in northwestern Minnesota.

Pictured left to right, representatives of the dairy partnership in northwest Minnesota. Larry Smith (University); Roger Odegaard, chairman, Dairy Support Committee (dairy industry); and Senator Roger Moe (Legislature).

Smith's Comments

Meetings and paperwork seem to be the norm for this season of the year. Someplace in this country there must be a business whose sole purpose is thinking up forms that someone else thinks should be filled out. I'm sure it is a very profitable business. The best part about these forms is that they are always due yesterday.

The crop scientists at the Station are analyzing the results of this past summer's research and will be reporting on the results at various winter meetings. In looking at some of the data, it's amazing the effect planting date had on the results obtained. The same variety of corn planted 6 days earlier on one field yielded 116 bu of dry corn per acre, while on the later planted field the corn did not mature, rotted, and was plowed down. Judging by the amount of corn still standing in much of northwest Minnesota, many other producers must have shared the same experience!

The beef research program increased in size and scope again this fall after some years of retrenchment. One hundred sixty large frame Charolais cross steer calfs are being fed to determine the effect of systems of feeding on rate of gain, feed efficiency, and quality grade. These calves were purchased from the Willie and Blaine Schmalz herds at Lancaster, Minnesota.

The staff at the Northwest Experiment Station wishes everyone a very Merry Christmas and Happy New Year.

Calendar of Events

Dairy Day
January 14

Sugarbeet Meetings
Fargo - Jan. 22
Grafton - Jan. 28
Grand Forks- Jan. 29

Red River Valley
Winter Shows
February 14 - 23

International Sugarbeet
Grower Institute &
Machinery Show
March 19 & 20

Princess Kay of the Milky Way, Miss Stephanie Dickey, Leonard, Minnesota, is pictured with Gene Miller, information officer, Northwest Experiment Station, during one of the many dairy information sessions conducted across northwestern Minnesota this past year.

The occasion of the "Grand Opening" of KMCA-FM at Ada, Minnesota brought the two together to talk about the dairy research and education developments at the University of Minnesota, Northwest Experiment Station and College at Crookston.

In regard to a possible "Grand Opening" of the new dairy facilities hopefully to be completed in 1986 at the Station, Princess Kay, who attended the Technical College, at Crookston, promised to help celebrate that occasion.

The Staff At The Northwest Experiment Station Wishes You All A Happy Holiday Season

No Slow Dancing in the Fast Lane to Increased Profitability

By Dr. John Wiersma

Profitable production of small grain crops, as well as other crops, requires careful consideration of several management alternatives each year. There are few substitutes for good planning and even fewer shortcuts to increased profitability. Many of you started planning for next year's wheat or barley crop by tilling and applying fertilizers and herbicides last fall, and you will continue to make important management decisions during the months ahead. We are involved in a similar process here at the Northwest Experiment Station where several recommended production practices are reevaluated, in cooperation with project leaders form the St. Paul campus, on a fairly routine basis. With producers' everchanging, management-intensive style of agriculture, it is often necessary to double check standard practices, to reaffirm that recommendations made for older varieties and methods of production are suitable for today's agriculture. Included in this process of reevaluation is some research that Dr. D.C. Rasmusson (Leader, Barley Improvement and Genetics Project, U. of M., St. Paul) and I are doing with past, present, and future varieties of barley and recommended planting dates and nitrogen rates.

Current recommendations for high yields of malting barley of 13.5% protein or less emphasize early planting and nitrogen rates of about 100-200 lbs. of total nitrogen (soil + fertilizer)/acre. These recommendations are based on research conducted with numerous varieties at several locations over the last 15-20 years, and the general principles are considered valid for most situations.

During 1983 and 1984, five varieties ('Glenn', 'Larker', 'Morex', 'Robust', and 'M46') were planted early and late and at relatively low and high levels of nitrogen fertility. Despite their inherent genetic differences, all varieties responded similarly to planting date and nitrogen level. The average yield responses of the five varieties for 1983 and 1984 are shown in Figures 1 and 2. When you first looked at Figures 1 and 2, you undoubtedly noticed two things right away: (1) that the slopes of the two lines in Fig. 1 are quite different from those in Fig. 2; and (2) that the yields were substantially higher in 1984. That's good! There's no room for slow dancers in the fast lane. Let's take a closer look at what happened during 1983, first.

During 1983, the low level of nitrogen (N) was 50 lbs. of total N/acre and the high level was 125 lbs. N/A, which is close to the recommended rate. The early date of planting was April 25 and the late date was May 23. Two general principles of production of malting barley are reaffirmed by these results. They are: (1) early planting is better than late planting for both relatively low and more optimum levels of nitrogen; and (2) while barley responds to increased nitrogen fertilization whether it is planted early or late, the response is substantially greater when combined with early planting. The protein percentages measured in this trial were all less than 13.5%.

Figure 1. Average yield of five varieties of barley during 1983.

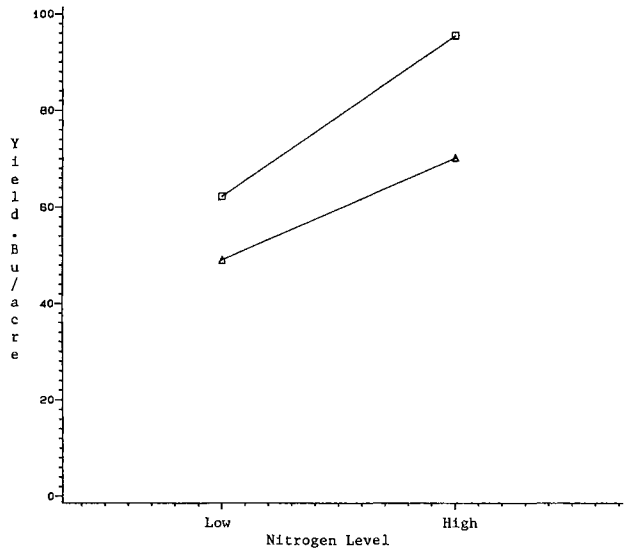
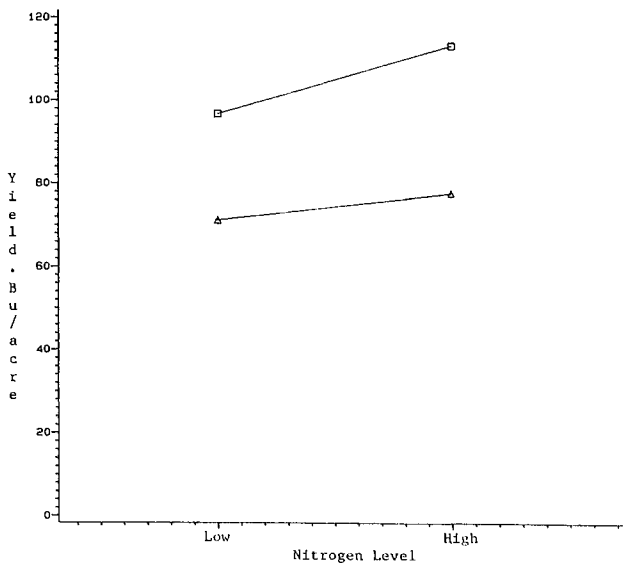


Figure 2. Average yield of five varieties of barley during 1984.



Continued from page 3

So what does this mean in terms of profit potential? What are the economic advantages of early planting and additional N fertilizer? The average yield advantage for early planting in 1983 was 19 bu/A. At today's market price of $1.50/Bu, this 19 Bu/A yield advantage is the same as $28.50/A, or about $1.02/A/day. The average yield advantage of using 125 lbs. N/A compared to 50 lbs. N/A was 27 Bu/A or $40.50/A, or about $0.42/A/lb N after subtracting the cost of the additional N ($9.00/A from 75 lbs. N/A of 82-0-0 at 12¢/lb. N). You may want to check my figures. Use the information in Table 1.

We could summarize the results from 1983 as follows: the barley varieties of today respond very much like yesterday's varieties, and early planting and additional N fertilizer are still economically advantageous. These conclusions, however, may not apply to situations where initial soil N levels are considerably higher. Let's take a look at what happened during 1984, next. Don't fall asleep at the wheel, now! Keep this spaceship in the fast lane.

During 1984, the low level of N was 100 lbs. of total N/acre and the high level was 170 lbs. N/A, (Fig. 2) which is substantially above the currently recommended rate. In this situation, it would be more appropriate to refer to the 100 lbs. N/A rate as a medium level of N and the 170 lbs. N/A rate as a very high level. The early date of planting was April 25 (same as 1983) and the late date was May 30 (one week later than 1983). The results for 1984 are similar to those for 1983, but they are also a little different. Like 1983, in 1984: (1) all varieties responded much the same to planting date and nitrogen level; (2) early planting was superior to late planting for medium levels of N and especially for high levels of N; and (3) while yields were increased by adding more N with either early or late planting, the response was much greater with early planting. Unlike 1983, however, in 1984: (1) the overall response to additional N was not nearly as great; (2) there was little yield response to excessive N with late planting; and (3) protein percentages associated with the very high level of N often exceeded the minimum 13.5% required for malting barley.

Flip the switch on your PC an let's see whether it paid to plant early or to add more N when initial soil N levels were medium. The average yield advantage for early planting in 1984 was 31 Bu/A, or $46.50/A, or about $1.33/A/Day. Again, early planting paid. On the other hand, the average yield advantage of using 170 lbs. N/A compared to 100 lbs. N/A was 10 Bu/A or $15.00/A, or about $0.09/A/lb. N. The returns from adding excessive amounts of N are not particularly attractive. Although a rate lower than the recommended rate of 100-120 lbs. N/A was not included during 1984, it very likely that this rate would have produced lower net returns per acre than the medium level used.

Combining the results from 1983 and 1984, we can summarize the information as follows: (1) today's varieties of barley respond pretty much the same as yesterday's varieties; (2) early planting is economically superior to late planting, especially as N levels are increased; and (3) higher rates of return/A are associated with the recommended rate of 100-120 lbs. total N (soil # fertilizer)/ per acre. Remember there are few short cuts to increased profitability...fertilizer to 100-120 lbs. N/A and plant early.

Table 1. Average yield (Bu/A) of five varieties of barley planted early and late and at relatively low and high levels of nitrogen during 1983 and 1984.

Planting Date	1983 Nitrogen Levels			1984 Nitrogen Levels		
	Low	High	Average Planting Date Yield	Low	High	Average Planting Date Yield
	Bu/A					
Early	62	95	78.5	97	113	105.0
Late	49	70	59.5	72	76	74.0
Average Nitrogen Level Yield	55.5	82.5		84.5	94.5	

Dr. John Wiersma checking the Northwest Experiment Station grain plots.

Weather or Not?

Dr. John A. Lamb

Weather records have been kept at the Northwest Exp. Sta. since June 1915. If you add to that the weather records kept in Crookston from May 1885 to Feb. 1923, we have 100 years worth of information. Over the years we have had several weather observers. At the present time the soil science project at the Northwest Experiment Station in cooperation with Dr. Mark Seeley, state extension climatologist, is responsible for obtaining and maintaining the weather records. Russ Severson, associate scientist has been collecting weather information for 13 years.

John Lamb and the CR5, the automatic weather station at the Northwest Experiment Station.

Three years ago the weather station entered the computer age with the installation of an automated station at the Northwest Experiment Station. This instrument will not only record the air temperatures but also provide other climatic information such as humidity, soil temperature, wind speed, wind direction, precipitation, and leaf wettness (a form of measuring the amount of water evaporated from a plant). Observations can be made on a daily or hourly basis. During the first two years, data was recorded on to a cassette tape that was used to transport the weather data to a computer where it was summarized. Starting this summer a telephone mode was added and now the information is accessed via phone line by a microcomputer. Although the tape is not needed, during the summer months it is still used to keep a backup copy of the data. Until this year no winter data was obtained using the automated station because the tapes could not withstand the cold temperatures. With the new microcomputer connection we should be able to use it all winter.

Why do we collect all this weather information? This data is used to interpret results from experiments conducted during the growing season and also document the yearly climatic differences and their effects on results from long term studies conducted at the Northwest Experiment Station. Another use is to develope disease management models. Examples include models for cercospora leaf spot on sugarbeets and early blight on potatoes. These uses are designed to increase production efficiency. All this data is made available to the public through the National Weather Service and Minnesota Extension Service publications.

Dr. George Marx (L) dairy scientist, Northwest Experiment Station, Roger Odegaard (C) and Dr. Gary McVey visited while waiting to host DHIA supervisors at a recent meeting.

DHIA supervisors heard Dr. Larry Smith, superintendent, Northwest experiment Station, and Dr. George Marx, dairy scientist, explain progress and programs in dairy research in education which will be made possible by additional facilities at the Northwest Experiment Station, Crookston. As a result of the discussion between the supervisors and the University officials, a number of suggestions were made and several practical ideas regarding research projects and educational outreach surfaced.

Superintendent Larry Smith (R) and Lester Beck, Clearwater Nursery, Bagley, Mn., are shown putting the finishing touches on one of the Colorado Blue Spruce plantings which were recently added to the Experiment Station Scene.

Nine Colorado Blue Spruce, some of which were six to seven feet tall, were planted in various areas. Thirty-six green ash which had grown to approximately eight feet in height in the Station nursery were transplanted to selected sites where they will add a more groomed appearance to the Station's operating center.

These improvements were funded using interest receipts from monies designated to the Northwest Experiment Station Research Fund with special designation for campus beautification.

Abari Mukasa, Uganda, Africa, was a visitor at the Northwest Experiment Station, October 30-November 1. Mukasa was hosted by the various department heads and they toured and explained research projects in which the Station scientists are involved at the present time.

Mukasa has been in the United States for several months and has spent considerable time with researchers at St. Paul. He is the superintendent of a small research station in Africa in the province of Uganda. Circumstances there are considerably different than they are in the U.S. An average farm in that area is possibly four acres in size. Mukasa, who is educated and trained to a masters degree in agriculture and management, was highly interested in the various special areas at the Station. Abari is pictured looking over the Station combine with the corn head attached that was just getting started in the corn combining operation at the time.

The Northwest Experiment Station News
Issued Quarterly by

THE UNIVERSITY OF MINNESOTA
NORTHWEST EXPERIMENT STATION
Crookston, MN 56716

E.C. Miller, Editor

Patti Malme, Associate Editor

Second-class postage paid at Crookston, Minnesota

Address Correction Requested