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Hoff Developing Soil Chemistry Lab

Kim Hoff joined the staff at the Northwest Research and Outreach Center in June, 1997. Her primary responsibilities are maintaining and managing a developing wet chemistry laboratory for soil that will enhance the Center's research mission. Kim has a strong chemistry and laboratory background and will be conducting basic and some



not so basic chemical analysis of soil and plant materials. Since her arrival Kim has been busy cleaning, taking inventory, and re-organizing the laboratory in addition to developing chemical analysis procedures. Older equipment has been repaired or is being repaired and some new equipment has been purchased. There is still much that remains to be done to make the laboratory fully functional as a research soil chemistry lab, however the lab is in operation.

Kim has been instrumental in developing procedures for a variety of chemical analyses. Soil tests for phosphorus and nitrate nitrogen can currently be conducted in the laboratory as well as Kjeldhal digestions (breakdown of plant materials into a liquid using heat and strong acids), which are then analyzed for total nitrogen and phosphorus. Kim has also helped develop procedures of some not so common analysis such as a gravimetric determination of cellulose, hemicellulose, and lignin in decomposing residue.

Kim is pictured (above) pouring a liquid digest sample into sample tube prior to analysis on a Lachat 8000

autoanalyzer (background). The result from the autoanalyzer is displayed on the computer screen (pictured below) where Kim makes the appropriate calculations to find the concentration of nutrients in the original sample.

Kim works closely with the Center's Soil Scientist and has been a major contributor to the Soil Science project. She is involved in experiments that include phosphorus fertilization of sugarbeets, residue decomposition, Fusarium Head Blight interactions, and nutrient uptake, utilization, and efficiency with various seed-fertilizer placements using air seeders.

Kim's office and laboratory are located in Hill Hall 206 on the UMC campus. Please stop by when visiting the Center or UMC and Kim will be glad to show you around the lab. (Photos by UMC Media.)



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Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

Smith's Comments



What started as an early, dry planting season, with high expectations for above average yields, has turned into a disaster for many producers in northwest Minnesota. Thousands of acres of farmland remain underwater and unplanted as we approach the 4th of July with many of the planted acres having high drown-out areas. The weekly agriculture papers are crowded with auction notices, not only from producers, but also from agri-businesses in our region. I listened to the federal crop forecast today which mentioned an encouraging forecast for wheat. Apparently an encouraging report means different things to different people, as the price of wheat dropped six cents a bushel at our local elevators after the report.

The first group of fed steers housed in the new beef research facility (see photo) went to market in June. The design and layout of the pens and handling area was essentially done by the Station's maintenance and beef crews after visits to various feedlots around the State. All interior work, concrete, waterers, electrical, handling facilities, etc. were completed by the Station to keep costs down. The combined efforts of the maintenance, farm and beef departments were necessary to finish the facility before the snow fell and the first installment of calves arrived. Our office staff came down daily to offer moral support and bring soft drinks during the concrete pours when the temperatures were in the 80's and 90's. When they offered advice, they were sent back to the office. I was even involved in every phase of the concrete work. Every project needs a good "sidewalk" supervisor!



Overall the Station's research plots are in excellent condition. Some were planted later than we would have liked because of the constant rains, but the efforts of our research crews, along with help from cooperating departments in the COAFES at St. Paul got the job done. Our crops and soils field day is scheduled for July 20th. After the stress of planting this year's crop (or not getting it planted), why not take a day off and visit the research being done, visit with the University research staff and friends and relax for a day. We'll even have a free lunch for you at noon on July 20.

Danielson Named Employee of the Year

Mike Danielson, farm animal attendant on the beef research project was named **13th Annual Employee of the Year**.

Mike was employed by the University of Minnesota, Crookston as farm animal attendant beginning in 1982. He transferred to the Station in 1991 and is a farm animal attendant on the beef research project. Mike is enthusiastic about his work and was very active in working on the construction of the new beef research facility last summer.

Mike was nominated for this award by his co-workers because of his knowledge of his job, and his friendliness and willingness to help his fellow employees.

The **Employee of the Year Award** was designed to promote and recognize excellence

in job performance among Civil Service and Bargaining Unit personnel. Funds for this special award come from a President's Club donation designated especially for this purpose. Congratulations, Mike!



Pictured left to right: Larry Smith, Mike Danielson and Gwen Danielson.

Prairie Ecosystem Research at the Northwest Experiment Station

By Dan Svedarsky

Positioned at the edge of the prairie in northwest Minnesota, the Northwest Station is ideally situated to carry out research and management demonstrations on remnants of this once vast tallgrass prairie ecosystem. Research on the use of fire in managing prairie vegetation has been on-going at the Station's **Red River Valley Natural History Area** since 1971, under the direction of wildlife scientist, Dan Svedarsky. Results of the burning research have been applied to habitats managed for greater prairie chickens which occur no more than 10 miles to the east, on lands owned by the Department of Natural Resources and The Nature Conservancy. In the spring of 1998, the Station hosted a national symposium on prairie chickens and featured status reports from throughout the range. A proceedings has gone to press containing these papers and will be available in mid-summer.

Commencing in the summer of 1998, Svedarsky coordinated the use of fire and grazing as management tools on the Mentor Prairie Wildlife Management Area and the Pankratz Prairie, both located east of Crookston. Brush encroachment and excessive build-up of litter can be problems on unmanaged prairies which tend to reduce their use by prairie wildlife. Fire top-kills woody vegetation and positions the tender regrowth within reach of livestock which readily utilize it and hopefully will control it after repeated browsing. Burning also increases the utilization of herbaceous vegetation as well as stimulating

more productivity which can add to wildlife food and cover values.

While grazing has been used little on public land in Minnesota, it is common in western states. The combination of fire and grazing is somewhat unique though as a wildlife management tool and studies are underway to determine how to balance wildlife management and other values of prairie with providing rotational grazing opportunities to local farmers where possible. Initial funding has been provided by grants from the Pembina Trail Resource Conservation and Development Association and the North American Waterfowl Conservation Act through The Nature Conservancy. Currently, a major grant will likely be funded through the Legislative Commission on Minnesota's Resources to continue the evaluation of fire and grazing effects on vegetation, livestock production, and the use by prairie birds. Grazing ecologist,

Greg Cuomo from the West Central Experiment Station, and botanist, Margaret Kuthenreuther from the University of Minnesota, Morris are cooperators in this project. The project will contain study sites located from Polk County south to Stevens County to include a good representation of prairie types along the beach ridges of Glacial Lake Agassiz.

The project also includes funding to inventory gravel deposits in a study site in Clay County with the goal of planning for balanced use of gravel, grazing, and prairie conservation. The site is in a high aggregate demand area due to the proximity to Fargo-Moorhead.

Technical as well as popular publications are planned for the projects to extend the findings to the various use groups; including conservationists, ranchers, prairie enthusiasts, and agency personnel. For more information contact, Dan Svedarsky at 218-281-8129.



Field researchers measure the species composition and productivity of a bushy prairie near Mentor, Minnesota.



UMC and NWES faculty and staff were honored recently at the Recognition Celebration held on the UMC campus mall. From left: Chancellor Don Sargeant; Distinguished Professional and Administrative Award - Laurie Wilson, counselor; Employee of the Quarter - Anne Burke, senior accounts assistant at the Northwest Experiment Station; University Outstanding Community Service Award - Nancy Capistran, science laboratory services coordinator; Distinguished Service Award - Susan Jacobson, horticulture laboratory services coordinator; Distinguished Teaching Award - Charles Habstritt, associate professor of agronomy; and NWES Head, Larry Smith.

Pictured (L) is Peg Sherven, United Staff Association, presenting a certificate and congratulatory balloon to Janet Solheim, word processing specialist for the Northwest Experiment Station. Jan was named Employee of the Quarter for winter quarter at the University of Minnesota Crookston. Jan has taken classes to further her education and has been active on many committees and boards. Congratulations, Jan, on receiving this honor.



Recent visitors to the NW Station were Dr. F. Abel Ponce deLeon, Head, Animal Science and Dr. Phil Larsen, Interim Dean, College of Agricultural, Food and Environmental Sciences, St. Paul. They visited with area potato, dairy, sugarbeet and grain farmers about farm problems and opportunities in northwest Minnesota.

They are pictured above (L to R) Dr. Ponce deLeon, Dr. Larsen, and Dr. Larry Smith, Head, NW Experiment Station.

Dairy Research Feeding Study

by George Marx, Dairy Scientist

The Northwest Experiment Station has completed a feeding research study involving a cooperative project between AURI (Agricultural Utilization Research Institute) and a retail-wholesale feed manufacturer from Kandiyohi, MN.

The feed was a high energy, protein and fiber product consisting primarily of extruded sunflower seeds. This was compared to conventional whole fuzzy (linted) cottonseed. The feeding trial utilized 20 early lactation Holstein cows over an 85-day period preceded by a two-week pre-experimental standardizing period. Cows were paired for stage of lactation, producing ability, lactation number, sire, size, body weight, body condition and age. One of each pair was randomly assigned to either the sunflower product or the cottonseed group for feeding.

Total mixed rations (TMR) were fed and balanced for protein and fat content and were isocaloric and isonitrogenous. Both groups were fed the experimental or control product at 10 percent of the ration dry matter. Individual feed samples were taken weekly and composited for nutrient analysis along with the TMR. Rations were fed once daily and weighed individually to each animal. Weigh backs were also taken daily just prior to feeding each day. Both rations were fed to appetite with daily refusal kept at less than 7% of the ration. Acceptability and palatability of the product were determined by consumption rate/intake.

One reason for developing this product is to utilize sunflower seeds grown in Minnesota for a dairy feed vs whole cottonseeds shipped in from the southern that are used extensively by Minnesota dairymen. Reducing feed costs is also a concern for dairymen, particularly with high producing cows.

Ingredients and percent of dry matter in the two rations are shown in Table 1.

Table 1. Rations fed to early lactation cows including high fat products.

Ingredient in ration	Extruded sunflower	Whole fuzzy
	Product	Cottonseed
	-----% of ration DM-----	
Alfalfa haylage	24.0	24.0
Corn silage	24.0	24.0
High-moisture corn	26.5	27.0
Soybean meal	13.0	12.5
Sunflower product	10.0	0
Whole cottonseed	0	10.0
Calcium carbonate	0.5	0.5
Dicalcium phosphate	1.0	1.0
Sodium bicarbonate	0.2	0.2
Magnesium oxide	0.1	0.1
Trace mineral salt	0.5	0.5
Vit. ADE, Zn-Se premix	0.2	0.2

Both rations were formulated and balanced in nutrient value to meet requirements of the National Research Council (NRC) recommendations for dairy animals. Alfalfa haylage and corn silage were the primary forages with high-moisture corn, soybean meal and either the extruded sunflower or the cottonseed as the primary concentrate portion of the ration.

Milk production data, feed consumption, body weights and condition scores are featured in Table 2. Statistical analysis determined that milk production, fat and protein, feed consumption, body weights and body condition did not differ statistically ($P < 0.05$) between the two treatment groups. Health status, reproductive data, which includes services per conception, and pronounced pregnancy were similar in both groups.

Summary and Conclusions:

1. The high fat and fiber sunflower product was a useful supplement in early lactation and supported high milk production.
2. No unusual nutritional or health problems were observed.
3. Palatability and acceptability were favorable and not a problem.
4. The experimental group gained body weight similar to the controls.
5. Milk, protein and fat production were similar between groups.
6. No mechanical or handling problems developed in feeding the sunflower product.
7. The extruded sunflower product was satisfactory and economical as a high fiber and high energy supplement.

(Continued on page 6)

New Building Dedicated



Taking part in the dedication of the Controlled Environmental Science Building last fall were from left: Chancellor Don Sargeant; Julie Bleyhl and Warren Larson, U of M Regents; Bernie Lieder, Minnesota State Representative, and Larry Smith, Head, Northwest Experiment Station.

(Photo by UMC Media Services)

(Dairy Research Feeding Study Continued from page 5)

Table 2. Milk Production and composition, body weight & condition score of lactating dairy cows fed an extruded sunflower product or whole cottonseeds.

	Sunflower Product	Whole Cottonseed
Milk/cow/day, lb	68.4	67.0
Fat/cow/day, lb	2.68	2.64
Milk fat, %	3.93	3.93
Protein/cow/day, lb	2.09	2.03
Milk protein, %	3.06	3.01
4%FCM/cow/day, lb	67.5	66.2
Somatic cells, 10 ³	100	175
Avg. feed intake/cow/day, lb	80.1	80.1
Avg. DM intake/cow/day, lb	47.3	47.2
Avg. total body gain/cow, lb	47.6	49.6
Avg. daily gain/cow, lb	0.55	0.57
Avg. body condition score	3.28	3.23

Dairy Herd Award

The University of Minnesota, Northwest Experiment Station, Crookston, was named to the High Herd Honor roll by the Minnesota Dairy Herd Improvement Association. This honor goes to the top five percent of all herds on test in Minnesota for the past full year. The University herd averages 24,526 lbs of milk, 842 lbs of milk fat and 798 lbs of milk protein produced per cow per year.

There are a total of 3,987 herds on DHIA test in Minnesota. The Northwest Experiment Station herd is second high in production in their local testing association covering Polk, Red Lake, Marshall and Pennington counties and includes 43 herds with a total of 3,898 cows. The Crookston U of M herd is the top herd in the University of Minnesota state-wide system.

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Northwest News
Patti Malme, Associate Editor

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