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Agronomy

Mr. Russell D. Mathison, *Agronomist*

Intensive rotational grazing research will continue to be the major focus of Agronomy research in 1999. Three mixtures of forage species are being evaluated for forage yield, quality and persistence in an intensive rotational grazing system. Each of the mixtures includes a perennial legume component. Perennial legumes grown in Minnesota have historically lacked true long-term persistence.

1999 will be the third production year for half of the pastures, so added emphasis will be placed on collecting botanical composition and persistence data.

New research in 1999 includes a project on biological remediation of an industrially-contaminated soil. Burlington Northern railroad is funding a research study on a site containing elevated soil levels of benzo-a-

pyrene, a compound used in preserving railroad ties. Research in other states has indicated growing plants on contaminated soil increases the biological activity of soil microbes decomposing benzo-a pyrene. The focus of our research will be to attempt to identify perennial plant species capable of thriving on the site to enhance soil microbial activity, as well as to control wind and water erosion.



Animal Science Research Report

Dr. G. Cliff Lamb, *Animal Scientist*

The beef cow-calf research project continues to gain momentum. We could not have asked for a better spring for calving. The mild winter ensured that cows exited winter in excellent shape and calving this spring has resulted in a bunch of healthy calves. The excellent calving conditions and almost a 100% calving rate will ensure that our goal to increase our herd size to 200 cows will be achieved earlier than predicted. The excellent calving rate is indicative of the hard work and dedication of the animal crew who spent many cold, lonely nights this winter and early spring taking care of the cows. Ray Steffen, Terry Hanson, and Jim Schmidt need special praise for their efforts.

On the horizon, we plan to continue our intensive grazing studies with a focus on understanding the effects of various forage species and mixtures on cattle performance. This study will be entering its third year and we should have some interesting data to present to Minnesota cattlemen following the 1999 grazing season. Last summer and fall we participated in a creep feeding experiment to compare an alternative alfalfa leaf meal based creep to an industry standard creep. Again, our results appear positive and perhaps this will be an alternative feed source for producers to add to their creep rations and achieve maximum growth in their calves, at a more cost-effective price.

New experiments this summer will focus primarily on improving reproductive efficiency in beef cattle operations. For our replacement heifers, we will be using ultrasound technology and synchronization to fixed-time inseminate all the heifers on a single day. Similarly, we will be using a novel

estrous synchronization system to fixed-time inseminate our cows. The advantages of these systems are to eliminate heat detection, especially for small-scale beef producers that have additional income sources and are not able to detect heat twice a day. Preliminary results indicate that these systems can produce results similar to natural mating for one heat cycle (approximately 65 to 70%)!!!

We are in the process of establishing a Heatwatch® system and an embryo transfer lab. The Heatwatch® system is a computer heat or estrus detection device where a transmitter attached to the rump of each cow sends a signal to a computer receiver after she is mounted. Heatwatch is an extremely accurate method of heat detection and often takes the "guess work" out of heat detection. Within a year we will be using this technology to perform research aimed at enhancing reproductive efficiency in cattle operations in Minnesota. Reproductive management is an aspect of beef cattle production that is often neglected. Through research and education on reproduction, we will attempt to further enhance the quality and uniformity of beef produced in Minnesota.

Guests from Turkey

Finally, we are fortunate to have two guests from Turkey visiting for a month, and an intern from Kansas who will be with us throughout the summer. Drs. Ertugrul Bozkurt and Ali Ihsan Akin arrived in late May and will be at the Research and Outreach Center until late June. The purpose of their visit is to learn many of the reproductive technologies that we have



From left to right: Dr. Ali Ihsan Akin, Dr. Cliff Lamb (NCROC Animal Scientist), and Dr. Ertugrul Bozkurt. Dr. Akin and Bozkurt are visiting veterinarians from Turkey. The purpose of their visit is to gain expertise in reproductive technologies at the North Central Research and Outreach Center.

established here. Their primary goal is to become proficient at embryo transfer and to return to Turkey to introduce this technology to cattle operations in their country. Sara Logan hails from Lecompton, Kansas where she grew up on a large beef cattle operation. She plans on attending veterinary school after completing her Bachelors degree at Kansas State University. This summer Sara will coordinate our rotational grazing research and gain experience in many of the additional reproductive technologies that we utilize in our research, such as ultrasound, artificial insemination, embryo transfer, and the Heatwatch® system.

Visitors are always welcome. Please feel free to give us a call and visit the facilities anytime.

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Forestry

Dr. Howard Hoganson, *Forester*

The Station is fortunate to have two new faculty members in forestry. Dr. Andy David is the University of Minnesota's new leader in forest genetics. Forestry staff members Kathy Haiby, Egon Humenberger and Tim O'Brien have been extremely helpful in helping Andy learn the ropes of the Aspen & Larch Genetics Coop and the long history of forest genetics work here at the Station. A key next step is to explore possible new directions. Rising timber prices have increased interest in a number of species for possible genetics work. Narrowing the range of species for focus will be a challenging task. With aspen, the focus is shifting more towards stand establishment and silvicultural needs. Dr. Dan Gilmore, a silviculturist, was hired to help lead that charge. Dan joined the faculty in January. Emphasis in aspen establishment will focus first on marginal agricultural lands. With the warm spring staff has been busy trying

to keep up with mother nature. Both Dan and Andy have rolled up their sleeves and gotten their boots dirty.

Howard Hoganson's work this summer will center around analysis and model development for Minnesota's two National Forests. Emphasis will be on trying to better incorporate spatial and environmental factors into the planning and analysis process. Spatial elements considered will include management in riparian zones and the distributions of stand age and cover types over time as related to potential wildlife habitat needs. Public workshops are planned for July to review a broad range of alternatives and issues for analysis. Josh Bixby, a grad student from the Forest Resources Department will spend the summer at the Station helping on this effort. Howard was recently an invited speaker for the Western Forest Economists meeting as spatial management issues are of great interest nationwide.

A search process is also underway to fill a new tenure-track position in forestry, which will be located at our station. This position was made possible thanks to our colleagues in the University of Minnesota Department of Forest Resources and some strong support from Minnesota State Representative Loren Solberg. The position will focus on multi-resource silviculture with both a research and extension component. Plans are to interview three candidates at the Station on each of the first three Wednesdays in June. Feel free to contact Howard Hoganson for more details (327-4362). Thanks should go out to community members Tom Engel (Minnesota DNR Wildlife), Brad Jones (Itasca County Land Department), John McCoy (Blandin Paper), Brian Palik (USDA Forest Service Research) and Kathleen Preece (*Minnesota BetterForests*) for all their time spent on this important search.



Horticulture

Dr. David K. Wildung, *Horticulturist*

This year is the year of the strawberry in the horticulture plots. Several new plantings have been established to evaluate flame weeding and renovation. A new Junebearing variety trial comparing standard cultivars with 25 of our advanced breeding lines and new cultivars from Canada was planted. Eleven day neutral breeding lines from the University, and the USDA breeding programs will be compared to the standard cultivars "Tribute" and "Fern". The cooperative Minnesota - USDA breeding program continues to grow with two new plantings. In addition, this year several promising breeding selections were sent for trialing to Michigan State University, Iowa State University and University of Wisconsin-River Falls. We are also evaluating new breeding lines from several other breeding programs in Nova Scotia,

Quebec, New Jersey and University of Wisconsin-River Falls. With the mild winter, prospects for a busy strawberry evaluation season look great in 1999.

Several other new projects will be conducted this season. With vegetables, colored mulch studies using red, green, clear, blue, and black plastic will be completed with tomatoes, peppers and muskmelon. These plastics are supposed to improve earliness and production. While we will greatly reduce our vegetable research program in 1999, an All America vegetable garden will contain many new vegetable cultivars in 1999. Several new things are being added to our flower plantings. First of all about 80 of our annual flowers will be grown from plugs rather than from seed. Plugs are becoming the standard in the industry and provide a larger more uniform transplant. We will also be

evaluating 50 cultivars in hanging baskets for the first time. These will be located in our new shade area. In the chrysanthemum plots we will be evaluating 25 new breeding lines (selected in 1998) for the first time in ten plant rows. Several of these are early flowering or exhibit prostrate growth forms. At the same time this is written, we are also taking bloom notes in our blueberry research area in what appears to be a very heavy crop in 1999.

Finally, Tom Carpenter and I have worked together for thirty years. Tom has decided to retire in July. It is said that time goes by quickly when you are having fun or enjoy what you are doing. I can't believe how fast these years have gone by! Thanks Tom for a great run! Best of luck to you and your family as you enter this new phase of your life!



Plant Pathology

Dr. Robert F. Nyvall, *Plant Pathologist*

Plant Pathology research continues to focus on two main areas; diseases of cultivated wild rice and development of mycoherbicides to control aquatic weeds. Additionally, research is frequently done on vegetable diseases in cooperation with the horticulture program and outreach is conducted on various aspects of plant diseases. Research on diseases of cultivated wild rice deals with the major diseases of wild rice and their control. This involves determining the life cycle of the pathogens and the period during the life cycle when they are most vulnerable to control. Diseases that have been studied to date include fungal brown spot, spot blotch, Fusarium head blight, and stem canker. Several other diseases that are unknown at this time have also been observed. Future research will concentrate on these diseases also. A major component of the research

program involves the testing of fungicides and the determination of plant health as it relates to disease resistance. Fungicides have been routinely used for a number of years to control diseases on wild rice. However, these tend to be expensive and are not always efficacious. New fungicides are being tested as to rates and timing. Nitrogen has been found to be means to reduce disease incidence and severity. Determination of plant nutrition requirements and their interaction to disease will continue to be studied.

Mycoherbicides are a form of biological control utilizing microorganisms in a carrier to control undesirable vegetation. Effort has been spent on determining a mycoherbicide to control purple loosestrife. To date no satisfactory fungus/carrier combination has been found although several have

been tested. A promising fungus called Sphaeropsis has been isolated from dead purple loosestrife plants in a research greenhouse on the St. Paul Campus. This fungus has been the most promising to date and is currently being patented for this use. Future research will also concentrate on weeds in cultivated wild rice fields. Researchers in Australia have developed a promising mycoherbicide to control water plaintain in rice fields. This is the same weed commonly found in wild rice fields in Minnesota. This mycoherbicide will be researched to determine its efficacy in controlling water plaintain in Minnesota. Additionally, other aquatic weeds will be researched in attempts to utilized biological control to control them safely without the dangers inherent in chemical herbicides.



Wild Rice Breeding and Germplasm Improvement

Dr. Raymie Porter, *Wild Rice Geneticist*

We are increasing the breeding population PBR-C4, anticipating its release in the fall of 2000. This line has undergone four cycles of selection for fungal brown spot disease resistance, lodging resistance, shattering resistance, and yield. Tests from the past two years' variety trials show its superiority to currently grown varieties, including Franklin (our most recent release), for most or all of these traits. The University's Crop Variety Review Committee has approved increase of PBR-C4, requiring that Plant Variety Protection be sought for this variety. Release will be sought after the first increase.

We are continuing to explore avenues of research for germplasm preservation with Dr. Erv Oelke in the Agronomy Dept. in St. Paul and Dr. Christina Walters at the USDA's National Seed Storage Laboratory in Ft. Collins, CO. In the near future, we will likely begin

supporting a graduate student working on some aspect of seed storage methodology, conducting some of his/her research at Dr. Walters' lab and some at the U of M. Meanwhile, we have collected some wild germplasm from public waters in Minnesota, from stands which we suspect to be declining. We intend to grow out the accessions and send seed to Dr. Walters' lab for a pilot storage project.

We are continuing to collaborate on molecular genetic mapping of wild rice with Dr. Ron Phillips and his grad student, Peter Imle. They will be concentrating on finding RFLP markers more closely-linked to a major gene controlling shattering. We will also be developing tester lines with known shattering genes, to use in crosses to unknown breeding lines. These crosses will yield information about the shattering genotypes of our breeding

lines, resulting in lines fixed for nonshattering. Scott Jackson, who is finishing his Ph.D. at UW-Madison, will fill the postdoc position for the mapping project beginning in August, based in Dr. Phillips' lab in St. Paul. He will continue the overall mapping project, focusing on refining the current map by adding more markers and traits. Refining the gene map should give us a better understanding of the genes involved in shattering and other traits, and allow us to use markers to select more effectively for improvements in these traits. Meanwhile, we have advanced a number of lines from the RFLP mapping population, made a few strategic crosses between lines, and advanced a promising breeding line which appears fixed for one or more nonshattering genes. We have crossed this line to several lines from the mapping population to begin to determine its shattering genotype.

Alumni News

North Central School of Agriculture alumni should be pleased to learn that one of their fellow alumni, Walter Thomas Carpenter, has been selected to receive the Presidents Award for Outstanding Service. Tom is one of 12 University of Minnesota faculty and staff to receive this year's award. The award, established in 1997 by University of Minnesota President Mark Yudof, recognizes individuals for "exceptional service and commitment to the University." It is a very high honor.

Those who know Tom and how he feels about his work and the University of Minnesota will know that he

very much deserves this recognition. In the 37 years that Tom has worked at the University of Minnesota he has always taken pride in his work and has been a loyal and dedicated supporter of our station and the University of Minnesota.



The Presidents Award also recognizes Tom's special service to the alumni of the North Central School of Agriculture. His continuous efforts to bring alumni together for reunions and station events has helped maintain strong NCSA support for the University and the North Central Research and Outreach Center.

Tom will be retiring July 2nd. We will all miss him. This award is appropriate recognition for many years of exceptional service to the University. Congratulations to Tom, his wife Gail, and their family, and special thanks to Tom for a job well done.

David L. Rabas

News from North Central

Dr. David L. Rabas, *Station Head, Professor*

Temperatures were warm and snowfall was moderate this past winter. December-March temperatures were 4 to 11 degrees above average. The past two winters have largely erased the memories of the winters of '95 and '96 except for the memories of the floods that caused so much hardship for people in the Red River Valley. April was warm and dry and May wet and cool. Forages are off to a good start, but cool wet conditions have slowed growth of spring planted crops.

Nineteen ninety-nine will be another exciting year at North Central. Construction is underway on the new building addition and we look forward to sharing facilities with faculty from the University of Minnesota Itasca County Extension Service and the opportunities this new partnership provides to serve the people of our state. Our name change to the North Central Research and

Outreach Center became official this May. The new name brings with it exciting opportunities to expand our mission to open the door to the full services of a major land university to the people of northern Minnesota.

Construction of the building addition, which includes access to meeting rooms and restroom facilities for physically challenged persons and office space for the Itasca County Extension Service and additional NCROC staff is on schedule. I anticipate the building will be ready to occupy by November or December. You are invited to stop by and see how the building is progressing.

Plans for the new building include an interactive television studio and video conferencing facility. When and if these facilities get built depends largely on our success in obtaining funding from a

Blandin Foundation grant. We should know in August whether we are successful in obtaining grant funding. The interactive television/video conferencing facility will increase access of area residents to the research and knowledge base of the University of Minnesota, and create opportunities to expand the services of the University in Grand Rapids to include advanced degree training, skill maintenance for teachers, nurses, doctors and other skilled professionals, and other credit and non-credit courses. The facilities will enhance opportunities for the Extension Service to provide additional programming for Itasca County residents and others.

Shoreland Vegetation and Landscape

Ms. Mary Blickenderfer, *Extension Educator*

On November 9, 1998, I moved my office from ICC across the street to NCROC and the newly created position of Extension Educator in Shoreland Vegetation and Landscape with the University of Minnesota Extension Service. This position serves shoreland owners and agencies within 17 counties of northeastern Minnesota. The first challenges of this new position include: developing local, commercial sources of native plants for shoreland restoration projects; continuing the shoreland work already started through the Big Sandy Watershed Clean Water Partnership; and working cooperatively with other agencies, tribal governments, lake associations, and individuals to promote shoreland stewardship. Many thanks to those who have helped me get settled into the new office and assisted me in times of computer crises.

Tourism

Dr. Veronica H. Long, *Extension Educator*

I arrived to the Grand Rapids NCROC on January 13th to fill the new position of UM Extension Service, Extension Educator in Tourism. I am part of the team of educators in the Tourism Center. I will be working in 17 counties in the Northeast. I came here from Virginia Commonwealth University in Richmond, Virginia where I was a professor teaching recreation and tourism courses. I have extensive experience in researching the social impacts of tourism on small communities. My work here in NE Minnesota will involve bringing programs from the Tourism Center to the district, and acting as a resource for communities, organizations, tribes, and individuals to learn about tourism. In particular, I will be working on heritage tourism and community projects with the Mille Lacs Band of Ojibwe. I am very happy to be here; I like having an office where I can see cows. Thank you to everyone who has helped me to settle in here!

Upcoming Events

Small Grains Field Day

Tues., July 20, '99 10:00am–Noon
Location: 4 miles south from Grand Rapids on Hwy 169, then 1/4 mile East on the Harris Town Road

Wild Rice Research Field Day

Thur., July 22, '99 9:00am–11:00am
Location: North Central Research and Outreach Center

Horticulture Day

Wed., Sep. 1, '99 2:00pm–6:00pm
Visitors can come and see many of the things described in the horticulture write-up.

Beef/Forage Field Day

Thur., Sept. 2, '99 10:00am–Noon
Registration begins at 10:00am.
Location: 4 miles south from Grand Rapids on Hwy 169, then 1/4 mile East on the Harris Town Road

North Central News

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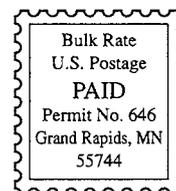
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