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NCROC Launches Beef Research Fund Campaign

In December, NCROC will be launching a two year Beef Research and Investment Fund Campaign. The goal of the Campaign will be to raise \$300,000 to strengthen current beef research programs and to develop investment opportunities/strategies to provide long-term permanent funding for beef research and outreach programs at NCROC.



Readers might ask why we need additional funds, or "Doesn't the state legislature provide tax dollars for agricultural research?" Many of our readers will be aware that state legislative funding for the University has continued to decline as a percent of total University funding. Currently, only about 36% of the University's revenue comes from legislative appropriations. The University has been forced to raise tuition and internally reallocate resources to support on-going research and education programs. In this process, funding for applied research (research that can be applied to address more immediate needs) has not fared as well as basic or "high tech" research. Revenue losses have hit hardest at outstate research locations such as Research and Outreach Centers where tuition revenue is not available to offset budget reductions.

Declining legislative support has affected opportunities to expand beef research in Minnesota. External funding, such as grants and gifts, has become an increasingly essential

source of funds for beef research programs. Animal research is expensive. Grant money and support from industry has helped offset some of these expenses. Additional resources are needed to maintain strong beef research and outreach programs at the University of Minnesota. Support for research from beef producers and the beef cattle industry is essential to the future of the industry in our state. The Beef Research and Investment Fund Campaign is one effort to secure additional funds. Over the next two years beef producers and those who would benefit from a strong beef industry in our state will be asked to help provide funding to maintain current beef research and outreach efforts and to invest in a plan to provide on-going financial support for beef research in Minnesota.

Our research and investment plan has two phases: In phase one funds received from the Beef Research and Investment Fund Campaign will be used to enhance the visibility and quality of the NCROC Angus herd and to supplement current and future research opportunities.

Artificial insemination, embryo collection and transfer, and additional reproductive technologies will be combined with sound genetic selection to enhance the quality of cattle at NCROC, with an ultimate goal of having a reputation for excellent beef cattle in Minnesota.

Phase two will ensure longevity and success of the program. NCROC will develop a plan of action to promote the sale of genetics in the form of seedstock bulls, breeding females, semen and embryos. Opportunities will be created to provide training and continuing education to beef producers, veterinarians, and industry personnel. Courses will be designed to improve the understanding of current reproductive technologies such as embryo transfer, ultrasound, in vitro fertilization, cloning and applied reproductive management strategies. A long term goal will be to develop a semi private company to provide reproductive technology services in the form of embryo collection and transfer, ultrasound, and to provide training in these areas.

If support from producers and the beef industry is sufficient to help us reach our fund campaign goal, we will have come a long way towards ensuring that a viable and growing beef research and outreach program will be available to Minnesota beef producers for many years to come. We have a team of dedicated beef researchers in place and others will join the team if we are able to provide the resources they need to support their research. If you have an interest in a strong Minnesota beef industry, now is the time to show your support.

This archival publication may not reflect current scientific knowledge or recommendations.
Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

News from North Central

Dr. David L. Rabas, Center Head - drabas@umn.edu

As I write this article it is early November and we are in the last days of "summer". Fall has been great, but winter will have arrived for our non-snowbird readers by the time this issue of the **North Central News** reaches you. Summer at NCROC provided a great environment for crop and livestock research success. As you can read elsewhere in this newsletter, our research goals were largely fulfilled and the growing season, with the exception of a mid summer dry period, was very good. The summer was warmer than average and the first killing frost didn't occur until September 24. The 149 day frost free period (April 27 to September 23) was the longest frost free period on record at our station.



The picture above of Executive Secretary Amy Johnson helping Agronomist Russ Mathison, is a reminder of two important aspects of our research program. One aspect is that we very much need and appreciate the assistance we get from our student employees during the summer. The student workers are an invaluable resource. We appreciate what they do for us and recognize the value of their contribution to our research. The second important aspect the picture represents is the teamwork that is necessary to get the job done. I appreciate the willingness of all our staff to pitch in, wherever needed, to get the job done. I want to take this opportunity to one more time say thank you to



all staff for a job well done.

We were honored this summer to have visits from both the Minnesota House of Representatives and the Senate Capital Investment Committee. The Committee came to our campus to learn more about our need for two capital improvement projects which are part of the University's request for legislative funding this year. The two projects reviewed were NCROC's request for demolition and replacement of our farm shop/carpentry building. A picture of the farm shop is included for those alumni friends who may have fond memories of this old building. The existing farm shop was constructed in 1915 for horse drawn equipment. It is very energy inefficient and does not fit our current needs for the repair of farm tractors and implements and design, modification and construction of specialized research equipment.

The second capital project request is a College of Natural Resources request for renovation and expansion of the existing Aspen Larch research offices and laboratory and the purchase of two parcels of land with varied soil types for hybrid aspen and other tree improvement research.

The two requests were considered for funding in the 1999-2000 legislative session, but like most University requests for "outstate" capital funding, they were not approved for funding in that session. If our readers, alumni and friends have an opportunity to visit with your state legislator, please put in a good word for our capital investment projects. These investments will provide lasting dividends in the form of improved quality, efficiency and scope of our research work.

If you have not visited NCROC in recent years, I want to issue a special invitation to stop in and say hello. Thank you to our many friends who do visit each year and who find our tours, field days and outreach meetings useful and enjoyable. In these difficult times as a nation, it is especially important to strengthen and renew those ties that bind us together as a nation and a community. In this month of Thanksgiving, please take time to be thankful for our nation and the freedom we enjoy.

Upcoming Events

Beef Cow/Calf Days

Friday, February 8, 2002

6pm - 10pm

Location: North Central Research and Outreach Center

Wild Rice Field Day

Thursday, July 18, 2002 (Tentative)

9:00am - Noon

Location: North Central Research and Outreach Center

Horticulture Day

Wednesday, August 28, 2002

2:00pm - 6:00pm

Location: North Central Research and Outreach Center

Beef Forage Day

Thursday, August 29, 2002

10:00am - Noon

Location: 4 miles south from Grand Rapids on Hwy 169, then ¼ mile east on the Harris Town Road

Garden Club Tour

Tuesday, September 3, 2002

6:00pm - 8:00pm

Location: North Central Research and Outreach Center



The "nature trail" I described in previous issues of the Newsletter has been completed. The picture above was taken during our community trail walk this past fall. Visitors and area science educators were given a guided tour by University biologist Janet Larsen. Thanks to Janet and Amy Johnson, Tim O'Brien and Tom Carey from our NCROC staff and ICC work study students for developing the access and signage for a very educational and enjoyable nature trail walk.

College Identifies New Strategic Priorities

The College of Agricultural, Food and Environmental Sciences has identified six new strategic priorities which will help guide the College's efforts in the years ahead. The priorities are the culmination of more than a year of work, including "listening sessions" involving more than 400 citizens, agricultural and community leaders and others at eight locations around the state, as well as input from students, faculty and staff.

The six priorities *promoting safe and healthy foods; improving environmental quality; enhancing agricultural systems; revitalizing Minnesota's rural communities; serving urban communities; and the overarching priority of emphasizing an exemplary education* were developed in recognition of changing student career interests, opportunities in the marketplace and critical challenges impacting our daily lives and the broader social issues we face now and in the years ahead.

Issues like concern over E. coli contamination. Diet-related chronic disease. How we use our land. Providing support for entrepreneurs in rural communities. The water quality in Minnesota's streams and lakes, and the use of fertilizers on yards and gardens. The flow of nitrogen into the Gulf of Mexico. And

educating our future leaders.

Along with these challenging *state and world* issues come significant changes in the needs and interests of students and employers. Over the past 10 years, student enrollment in the College has increased by 86 percent, with 54 percent of the students now coming from metropolitan areas. The enrollment is also marked by fewer prospective students entering traditional production-type agriculture. Instead, nearly 81 percent of the College's students pursue careers in fields such as environmental management, food product development, biotechnology, marketing, finance and trade and technical communications.

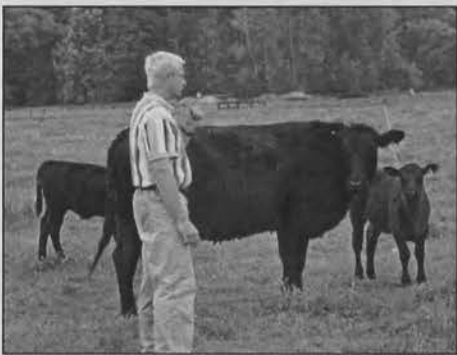
Over the past 20+ years, the College has been adapting to the needs of students and employers developing cutting edge curriculum, recruiting top faculty and broadening our educational offerings and experiential learning to keep our graduates the best in their fields. In fact, the College is already world renowned for our outstanding students, faculty, research, outreach and discoveries that are helping to address many of these issues. The priorities both build on those strengths and focus on areas of critical importance to Minnesota citizens and the public good.

In addition to continuing current efforts related to these priorities, the College is translating its vision into action by developing new, innovative initiatives that further advance each of the six priority areas.

"The end result of our priority process is three-fold," said Charles C. Muscoplat, Vice President and Dean of the College of Agricultural, Food and Environmental Sciences. "First, by focusing on the priorities, we can better direct the College's contributions that benefit the citizens of Minnesota. Second, we can use the priorities as guidelines for making best use of the College's human, financial and physical resources. We believe in holding ourselves accountable and our priorities help us do that. Third, the priorities enable us to leverage the strengths of our research, our undergraduate and graduate students and our faculty to develop and apply *knowledge for a changing world*."

"In the months ahead, we hope to work with our partners across the state to talk further about these priorities. Clearly, the key to our future success will be continuing to ask for and listen to citizen, student and marketplace needs."

To learn more about the College and its new priorities, visit www.coafes.umn.edu, or call (612)624-3009.



Well, another successful summer has resulted in an excellent set of calves that were weaned in early October. After a miserable calving season the calves seemed to recover well and we are happy with the weaning weights. Our heifers averaged 560 lbs and our bulls/steers averaged 580 lbs at weaning. Considering a fairly warm, dry summer and no creep feed we were happy with the gains on our calves (very similar to previous years in which we did creep feed our calves!). From a reproductive standpoint, our pregnancy rates were down about 10% from last year for which the blame goes to the tough winter and warm summer. The cows were in about one body condition score poorer condition than this time last year going into the breeding season. Nonetheless, a majority of our cows ended up pregnant by the completion of the breeding season, thanks to our excellent beef

Animal Science

Dr. G. Cliff Lamb, Animal Scientist - clamb@umn.edu

Category	Age Range	Pregnancy	Comments Status	Price Range, \$
Registered Cows	3 to 8 years	Pregnant	Good quality, sound cows Will calve 5/30/02 to 6/15/02	1,050 to 1,200
Registered Cows	2 to 10 years	Pregnant	Poor quality (cull cows) Will calve 4/29/02 to 6/10/02	650 to 750
Registered Cows	2 to 9 years	Open	Open cull cows	650
Non-registered Cows	3 to 6 years	Pregnant	Good quality, sound cows Will calve 4/12/01 to 6/1/01	1,000 to 1,050
Non-registered Heifers	Yearlings	Pregnant	Excellent replacements	1,000

crew (Dan Brown, Ray Steffen, Terry Hansen, Jim Schmitt, and Kristy Balder).

As I mentioned in our previous newsletter, our cow herd total has reached a capacity at which we need to sell approximately 50 females each year. To prevent any bias we will sell these cows on a private treaty, "first-come-first-serve" basis. If you are interested in purchasing replacement beef heifers, pregnant cows, or open cull cows please feel free to contact us at the NCROC. Please refer to the attached table for prices and categories.

Again, the Extension/Outreach programs seem to continue steamrolling with an excellent

turnout for Beef/Forage Day in August. Our next large endeavor is 2002 Cow/Calf Days, which is scheduled in nine different locations throughout the state. The Grand Rapids location will be an evening program on February 8, 2002. Please plan to attend. The speakers will again be excellent.

Construction has started on a new embryo transfer facility, which will include a heated collection bay and a small laboratory for embryo processing. We hope to have the facility completed before the end of the year. Up until now we have been unable to perform embryo transfer during the

Animal Science continued from page 3

cold winter months because we have lacked a heated facility. This facility will provide us an opportunity to continue research even during extremely cold periods of the year.

Speaking of research. We completed six experiments during the course of the summer. Two experiments involved inducing twins into recipient cows. The more successful method was to split a



single embryo in half and transplant both embryos into a single recipient. This resulted in an 81% overall pregnancy rate, with a 45% twinning rate and a 123% pregnancy per embryo transferred rate! We also are continuing our research comparing different mineral types (organic vs inorganic) on embryo production in superovulated heifers hopefully we will have some substantial data by March. Additional research included resynchronization of the second estrous cycle using MGA, ovulation

times and rates associated with reproductive tract scores in heifers, and additional research using the Heatwatch system. For a more detailed synopsis the results will be published in the 2002 Beef Cow/Calf Day report.

To contact Cliff Lamb or Dan Brown call 218-327-4490

The Animal Science crew at NCROC wishes you a productive and successful winter and we welcome you to visit our Center any time.

Agronomy

Mr. Russell D. Mathison, Agronomist - mathison@umn.edu

nutritious, leafy forage and fast regrowth after grazing. All three species continue growth later in the fall. A grazing trial seeded in August 2000 is being conducted here at the North Central Research and Outreach Center to compare the performance of perennial ryegrass, festolium and tall fescue with cool-season grass species commonly grown in our area (smooth bromegrass, orchardgrass and reed canarygrass). First production-year data indicate the three new species may be useful for grazing in northeast MN. There was some concern perennial ryegrass would not survive the winters in our northern climate. At least for the first production year, most of the varieties survived very well, with stand ratings at the initiation of spring growth above eighty

percent. Stands of festolium and some tall fescue varieties were also very acceptable. It will be interesting to monitor stand persistence in this trial over time. Forage yield data indicates a few of the perennial ryegrass and tall fescue varieties may have the potential to produce forage yields similar to orchardgrass. Perennial ryegrass regrew quickly after grazing, faster than any other species in the trial. Most tall fescue varieties, festolium and some perennial ryegrass varieties were still green and leafy at the final grazing in early November. Regarding forage palatability, it appears perennial ryegrass may be preferred by cattle. They usually chose to eat the perennial ryegrass first, and grazed it close to the ground, before moving to other species.



Hybrid aspen seedling establishment via planting and shearing working with the species inherent potential

The Aspen and Larch Genetics Cooperative (ALGC) hybrid aspen breeding program is based on a traditional strategy of crossing parents having desirable traits to produce superior offspring for deployment in reforestation. To date the product of the ALGC breeding program has been improved seed from which seedlings are undergoing testing to characterize family performance. The principal obstacle to deploying improved aspen from this breeding program has been the successful field establishment of planted hybrid aspen seedlings.

Numerous ALGC planting efforts to date have relied on planting seedlings in schemes similar to those used with high success in the establishment of conifers. Several tests have been

Aspen Silviculture and Management

Dr. Paul D. Anderson, Ecophysicologist/Silviculturist - ander374@umn.edu

planted that were designed to evaluate the effects of seedling size, various methods of site preparation, and varying degrees and methods of competition control. The general result from these trials has been highly variable survival and the anecdotal identification of a myriad of mortality factors including stock quality, pathogens, herbivory, competition, and herbicide intolerance. Positive results of previous tests suggest that success increases with stock size, with control of competing vegetation, and with the avoidance of first year moisture deficits and late spring frosts.

We are examining alternatives to aspen seedling establishment by the traditional conifer plantation scheme in which seedlings are planted individually in rows spaced 2 to 3 meters apart. In particular we are exploring approaches in which aspen seedling establishment is accomplished as a two-step process of planting and subsequent clonal expansion following shearing.

One approach has been planting dense clusters of aspen seedlings, with individual clusters being widely spaced (as far as 10 meters apart). These "dense packs" are intended to mimic natural regeneration processes of aspen in which the high attrition of young plants is compensated for by initially high densities. In the case of planted dense

packs, it is anticipated that similar attrition within a pack may occur, but there will be a critical number of survivors that will survive, thus accomplishing the first objective of getting improved genotypes established on the site.

To achieve full site occupancy by improved aspen, we will take advantage of aspen's ability to clonally reproduce new stems from buds along the length of its radial-spreading root system. We will stimulate the production of these "sucker" stems by shearing the original planted aspen seedlings.

Several issues need to be resolved in developing the dense pack concept into an effective silvicultural option. Relevant research questions are: 1) what number of stems must be planted per dense pack to compensate for attrition and provide a critical minimum for effective sucker reproduction; 2) what is the density and radial distribution of sucker stems upon shearing the planted dense pack; 3) at what age or size should dense pack stems be sheared to achieve effective suckering; and 4) what level of site preparation and vegetation control is required to optimize sucker stem regeneration? We are addressing these questions through the establishment of new dense pack plantations and through monitoring sucker regeneration following shearing of existing hybrid aspen plantations.



Analyses for the ongoing USDA Forest Service planning process continues to dominate the time of Howard Hoganson and his graduate students. NCROC has served as a central meeting place for the interdisciplinary planning team for the

Forest Management

Dr. Howard Hoganson, Forester - hogan001@umn.edu

Minnesota National Forests (the Chippewa National Forest headquartered out of Cass Lake and the Superior National Forest headquartered out of Duluth). Graduate students Wei Yu, Eric Henderson and Josh Bixby spent the summer in Grand Rapids helping with analyses. Josh remains in Grand Rapids for the fall semester. Mitch DeJong, a new forestry graduate student, joins the team in January. Emphasis in the planning process is on better integrating environmental social and economic objectives. Two forest management scheduling models developed at NCROC are central to the analyses. Key issues will likely be

how much old forest and how might it best be sustained on the landscape over time. Plans for each of Minnesota's National Forest were last completed in 1986. The Itasca Forest Resources Network, a broad-based local community group, recognizes the importance of the Chippewa National Forest to local Itasca County communities and is monitoring the planning process. Draft plans describing a range of alternatives for each National Forest are scheduled to be released for public comment in late spring. Updates on the planning process can be found on the web at <http://www.fs.fed.us/r9/chippewa> and



As the 2001 growing season comes to an end, it is a good time to reflect on some of the results of our horticulture program.

The strawberry season was one of the best I have ever experienced. We had wonderful success with our burn renovation studies both at our cooperator farms and on the station. The burn unit as modified does an excellent job and we have started to renovate all of our plots by flame burning. One of our grower cooperators also used the unit to renovate his plantings this season. We expanded our studies to evaluate tractor speed and burner pressure in order to improve efficiency and reduce application costs. Use of burn renovation has resulted in cleaner fields and less herbicide use. We finished evaluation on one strawberry cultivar trial and planted a new one this season. Yields and quality evaluations were excellent. Several plots exceeded 20,000 lbs/acre (over 19 lbs/10 feet of row) with excellent fruit size and quality. 'Mesabi', our newest cultivar release, led the way and promises to be a very productive, hardy cultivar in our region. It should do well further south as long as the season doesn't get excessively hot. We also have several promising selections in the program. When Jim Luby, Pat Johnson and I evaluated breeding selections and seedlings we had a difficult time deciding which selections were the best (so many were). We took over 30 new selections in our seeding field (20 is normal). The future of strawberry breeding program truly looks

Horticulture

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bright!

Blueberry evaluations also went well with yields slightly better than average. 'Polaris' and 'Chippewa', the University's newest releases continue to do well. In our breeding plots we continued to discard old breeding lines in anticipation of planting newly propagated breeding selections in the 2002 season. The organic blueberry plot at the Staples Ag Center continues to provide answers about conversion from traditional to organic growing systems. Weed control and pH modification appear to be the biggest challenges but certainly the ability to grow and market organic blueberries in Minnesota is worth a great deal to both our growers and consumers who enjoy this highly nutritious fruit.

As mentioned in the last issue, we would be planting a new orchard. It was successfully planted and it now enters its first critical winter. Hopefully it can become well established before winter injury starts to take its toll. In the older orchard, 'Honeycrisp' continues to do well and does appear more hardy than previously though. It is a wonderful apple. Our raspberry trials were productive with the cultivars 'Nova', 'Caroline', 'Autumn Bliss' and 'Autumn Britton' doing well. A two year old black currant planting produced a good crop of fruit at an early age. Developing pruning systems that will allow easy harvest and disease management will be the challenges of this crop.

We as consumers are becoming more conscious of the food we eat. The natural chemicals in small fruits and vegetable crops have been shown to provide positive health benefits. One of the studies we cooperated in this year was to determine the effect soil moisture stress has on the concentration of nutraceuticals in Chinese cabbage. This study involves many researchers in horticulture, The College of Biological Science and the Medical School. We learned a great deal

about growing Chinese cabbage and creating stress on the plants and are excited about the opportunity to continue this research. It was also a joy this summer to work with Dr. Neil Anderson, plant pathology Professor emeritus, on the potato verticillium wilt project. We had excellent disease infection and were able to see some striking differences in resistance of potato breeding lines to verticillium wilt.

Our flower plots were larger than ever in 2001 with the best hanging basket trials we have ever had. Many new cultivars and flower types were evaluated and it was exciting to show the many tour groups which cultivars did best. Several of the 2002 All American Selections did very well including 'Tidal Wave Silver' Petunia, 'Sparkler Blush' Cleome, 'Chilli Chili' Ornamental Pepper, 'Ultima Morpho' Pansy and 'Black Magic' Geranium. The chrysanthemum plots were also above average and contained many exciting new cultivars. The development of the University "My Favorite Series" and first release 'My Favorite Red' is an exciting achievement. These shrub mums not only develop into a solid mound of flowers in their second and third year, they also appear to have greater frost tolerance and winter hardiness. Other new mum cultivars like 'Centerpiece Peach', 'Rosy Glow Sport' and 'Sesquicentennial Sun' made this plot a great attraction to the public as well as providing valuable information to the chrysanthemum breeding program. Several Master Gardeners evaluated the flower plots this year. The results of their evaluations are available.

Finally, I want to thank and pay tribute to our new Horticulture team. Keith Mann is completing his second year and Pat Johnson joined us in April. The long list of successes I have just reviewed above shows how well Keith and Pat are doing and I believe it will only get better in the seasons ahead.



After researching the plant disease fungal brown spot of cultivated wild rice for the last 10 years, the final pieces of the puzzle have been put together. We now know how it overwinters, how it spreads, how it infects, when it infects the plant and some idea of how to manage the disease. And like most science that involves two living organisms that do not follow human rules, the fungus that causes the disease and the wild rice host do not always behave as predicted. Additionally, other diseases of wild rice have been studied. Spot blotch, scab (fungal head blight), and stem canker have been researched and the results will be written up this winter and the results published in scientific journals. In the process of studying plant diseases, there are often more questions raised than answers found. Nevertheless we have a much better idea of how diseases affect cultivated wild rice than we did 11 years ago. Most importantly, the information garnered from this research will enable farmers



Control of flowering is taking on increased importance in both the Aspen / Larch Genetics Cooperative and the Minnesota Tree Improvement Cooperative. This need exists because first and foremost we cannot breed trees and move on to the next generation of seedlings without the flowers to make the crosses. Secondly, as cooperator seed orchards begin to produce good seed crops many species are flowering in synchrony, which makes collection of all the available seed very difficult. To better manage flowering in our breeding programs and seed orchards we initiated a flower stimulation project in both red pine and European larch using

Plant Pathology

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to manage these yield robbing diseases in better fashion than even a few years ago. I will be reporting on some of these diseases at the Annual Wild Rice Conference next January.

It's also approaching a time of my life when I am seriously thinking about retirement. We all have to face this issue sometime in our careers and after 35 years as a plant pathologist, it's time. I will be retiring within the year, possibly sometime later in 2002. However, a petty thought keeps running through my mind, unmitigated and intimidating, "Is that old geezer puttering around the edges of reality me!?" Life seems to be a circle. We start out as a drooling little person in diapers, unreasonable and wrinkled. And, cognately, end our mortality the same way.

I have come to the conclusion there are things in life besides academia and science such as grandchildren to spoil or avoid, depending on their mood and mine; weeds to pull and flowers to grow in the gardens; clever fish to mock my futility; pictures to paint; good books to read; and sunsets to fantasize over. There are still some ski trails and slopes I haven't been on and I hope my knees have a few good runs left in them. I'm determined to do a better job of putting that little white ball in the hole and I need to work on my backhand and forehand if my shoulders last. My only worry is I won't have enough time to do

them all...but I'll try.

I have thoroughly enjoyed being a plant pathologist for the past thirty-some years. I have always looked forward to coming to the office and laboratory each day. I have never considered it as "work". I would like to unashamedly borrow a quotation Dr. Kurt Leonard used on the occasion of his retirement. "When the average student leaves college, he does not simply feel invincible, he knows that he is. The heights before him do not daunt him in the least, and toward the figures on their shining summits he feels a friendly interest, as of one who will soon be there beside them. As the trail roughens and unexpected pitfalls disclose themselves, he aims at ever lower and lower peaks. And in the end, with heights unscaled and depths unplumbed, he plods with more or less contentment with myriad millions of his fellow men along the dusty plain, and his lot becomes the general lot of human kind...flashes of joy and sorrow, and the rest humdrum. And so, having reached no eminence whatever, but merely a pleasant patch of shade in a green meadow, I should like to sit down awhile and look forward and back...and around." Archer B. Fiffilan. 1929. *Sheep: Life on the South Dakota Range*. Reprinted 1993 by arrangements with the University of Minnesota Press, originally published, 1929, by Little, Brown, & Co., Boston.

Tree Improvement

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stem injections of gibberellic acid. The goals of this study are to a) identify the best amount of gibberellic acid to inject and b) identify the optimal time of the growing season to inject gibberellic acid to induce both male and female flowers in these two species. We used six different injection dates and two different levels of gibberellic acid to inject over 400 trees during the course of the growing season. Assuming the treatments work we will be counting lots of European larch flower buds in late April and red pine flower buds in late May. Waiting for spring is the worst part!

I also had the opportunity to visit several field sites this summer but two of them stand out as examples of some basic tenets of tree improvement; genetically superior parents produce faster growing seedlings and the amount of vegetative competition on a site dictates early seedling success. A visit to the Crow Wing County second-generation jack pine population reinforced the value of genetically superior parents. These three-year-old seedlings are the result of crossing statistically superior parents

from the first generation and they have a remarkable growth rate. Seedlings height averaged 45 inches across the plantation their extremely large terminal buds indicate that growth next year will again be exceptional. Another memorable field site visit demonstrates the importance of vegetation management on early seedling growth and survival. Hybrid aspen, like all poplars, is very susceptible to competition. So much so that even 50% ground cover is associated with decreased growth and increased mortality. In an effort to better control vegetative competition in our most recent hybrid aspen trial we sprayed a preemergent herbicide over dormant seedlings shortly after planting. This treatment provided excellent competition control through the middle of August and the seedlings responded by growing an average of 31 inches with survival in excess of 97%. Some of these seedlings were over four feet tall! Next spring we will again apply preemergent herbicide to get another year of competition control. By spring of 2003 these seedlings should be free to grow.



In the last issue of the North Central News, I discussed even-aged silviculture systems and introduced the concept of the uneven-aged silviculture system. The term uneven-aged management is somewhat of a misnomer because the age structure of an uneven-aged stand is often determined via the diameter distribution of a stand. This implies that stem diameter can be inferred from tree age, an assumption that rarely holds true due to a variety of reasons (e.g., slow growth caused by competition, drought, soil infertility). Nonetheless, foresters attempt to create uneven-aged stands through the creation of a target diameter distribution that will be achieved over multiple stand entries. For example, an even-aged stand having a range of diameter classes can be converted to an uneven-aged stand by leaving the best largest diameter trees and a progressively greater number of high-quality smaller diameter trees. That's right, true uneven-aged stands have a greater

Silviculture

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number of small trees than larger trees. This technique works well with shade tolerant species such as balsam fir.

Regeneration dynamics of aspen and birch *Funded by the Blandin Foundation*

Information from this project will be used to assess the economic efficiency of tree improvement programs and silvicultural practices. The nursery component of the project will be re-measured again this November. Several groups including members of the Aspen/larch Tree Improvement Cooperative have toured the nursery site since spring.

Modeling early regeneration processes in mixed-species boreal forests of Alberta

Funded by MDFP Research Trust, Canfor, and Daishowa-Marubeni Carrie Becker, now Carrie Berger a masters student working on this project, has been hard at work collecting and analyzing data to finish up her thesis this year. Carrie and Molly Matysik, now Molly Cavaleri, spent the month of July in Alberta completing data collection on this project.

By-product Application to Forest Soils *LCMR project ML 1999, Chap 231, Sec. 16 Subd. 10(g)*

The objectives of this project are to examine and report on the effects of co-application of biosolids, wood ash and/or paper mill residuals on seedling germination, survival, and growth. We installed 12

treatments at NCROC and 14 treatments at Cloquet using varying levels of biosolid application, wood ash, their combination, and complimented this design with fertilizer and lime treatment. Tim O'Brien and John Blanchard will take year-end measurements for this study. Molly Cavaleri is writing up the greenhouse component of this project for her master's thesis.

Effects of Blow-Down and Fuel Reduction Activity on Forest Succession Pathways in Northern Minnesota

Funded by and in partnership with the USDA Forest Service Louise Yount of the Cloquet Forestry Center, Myra Theimer of the USDA Forest Service Gunflint Ranger District and I led a tour of participants from the SAF Forest Ecology Workshop held in Duluth on a tour of our research sites for this project this past June.

Doug Kastendick and Eric Nelson have collected field data during this past summer. Hugh Johnson and Kamal Gandhi are working on different aspects of this project for their respective graduate degrees. My colleague from the USDA Forest Service, John Zasada, and I will be presenting preliminary results to staff from the Superior National Forest in Duluth this winter.

Next Newsletter an example of converting an even-aged balsam fir stand to an uneven-aged stand at NCROC



The University of Minnesota Extension and Water Resource Center Shoreland Program continues to work towards its goal of providing educational opportunities and materials that effectively train local networks of individuals to assist shoreland property owners in making appropriate management decisions. Over the past year, the Shoreland Landscaping Workshop Series was sponsored by eight Minnesota counties (Sherburne, Cass, Aitkin/Mille Lacs, Hubbard, Kanabec, and St.Louis/Lake), involving 160 participants in hands-on

Shoreland Vegetation and Landscape

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shoreland design, planning, and planting exercises. A new shoreland web site (www.shorelandmanagement.org) was created to provide practical information and additional resources. With the extreme flooding and storms of this spring and summer, monitoring of shoreland revegetation projects established in previous years provided valuable information on the effectiveness of various planting and erosion control strategies.

The educational opportunities and regions served by this program continue to expand. The Shoreland Volunteer Program, recently active in a 4-county area near St. Cloud, now includes a second program in Cass/Hubbard/Crow Wing counties. The 2002 Shoreland Landscaping Workshop Series will travel to Nicollet/LeSueur/Blue Earth/Waseca/Sibley/Faribault counties south of the Metro Area in addition to the

offerings in northern and central Minnesota. At the request of past participants, the new series will include a fourth workshop on follow-up management and monitoring of planted shoreland sites. An additional aquatic plant identification workshop is being developed by a University of Minnesota graduate student and will be offered in 2002.

The shoreland program creates educational materials in response to public and agency need. A presentation was recently developed to explain the ecology of algae present in our lakes and rivers, enabling citizens to identify an unnatural decline in water quality. Working closely with the SWCD and local zoning officials, we are currently developing resources that will enable the delivery of consistent, research-based, regionally adapted information for shoreland mitigation.



My work this summer and fall has been focused on two maturing projects. The first is the Grand Rapids Area Tourism Project. I have been in contact with several individual community members and organizing planning meetings for what is a



Wildrice yields were down in 2001 trials. At Aitkin, the average for the trial was 395 lb/A, while Waskish was only 752 lb/A (compared to 1844 lb/A, the average of three locations last year). This was probably a reflection of the problems many growers faced in their own paddies. 2001 was a year in which insect pests, particularly Lepidopterans (moths), were

Tourism

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community member driven process. At one meeting, I gave a presentation on tourism as a system and how the "product" of the industry is "visitor experience." It is a difficult industry to understand and most people think the tourism industry produces tourists. Everything in the region, including pre-visit impressions is combined to create an experience. It is a very complex system and is challenging to explain. Inherent in the fact that it is a complex system, is that many different facets of community life are involved with it. This projects hopes to coordinate and connect many of these pieces. This project will be a model for other

communities interested in sustainable tourism development and management to follow.

The other on-going project I have been managing is the facilitation of the formation of the Minnesota American Indian Tourism Association (MAITA). To date, the group has formed a mission statement, filed for incorporation with the state of Minnesota, and filed for non-profit, 501(c)(3) status through an attorney. Nine of the eleven federally recognized tribes in the state have participated in meetings. The group is planning another strategic planning session to focus attention on some new projects.

Wildrice

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present in high numbers. Not only were riceworms (*Apamea apamiformis*) a problem, but also stemborers (*Chilo plejadellus*). In addition, hot weather and storms characterized the latter part of the growing season, and likely had adverse effects on yield.

Even under low-yielding conditions, however, varietal differences could be observed. Petrowske Purple, the most recent release, yielded near the trial mean, and showed somewhat more Fungal Brown Spot (FBS) disease than in previous years. PBM-C6, a potential new variety, had the highest yield, and the least lodging, shattering, and FBS of any entry. However, it is also tall and has shorter seeds than some of the older varieties. If

approved for release, PBM-C6 should be named and made available to Minnesota growers by the fall of 2002.

Later releases may include a variety with very early maturity (to ease the process of cleaning up paddies of older early-maturing, shattering varieties); a variety fixed for nonshattering (to maintain the nonshattering plant type under continuous production), and a longer-seeded variety.

In the meantime, we are focusing on genetic studies involving seed size, hydration, and other traits, and collaborating with scientists in St. Paul to understand pollen shed, pollen travel, seed storage, and markers linked to key traits such as shattering.

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