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The North Central Quarterly

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GRAND RAPIDS, MINNESOTA

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This is Your Invitation to:

VISITORS DAY THURSDAY, JULY 19, 1990

*Wagonload of visitors**On-farm ash utilization**Grain crop amaranth***9:00 - 11:00 a.m.
CONTINUOUS WAGON TOURS**

Agronomy Research Plots
Horticulture Research Plots
Tree Improvement Nursery
Wild Rice Research Plots

**1:15 - 3:00 p.m.
CHOOSE ONE TOUR**

Bus Tour to Agronomy Plots
Wagon Tour to Forestry
Wagon Tour to Orchards

ALL DAY EXHIBITS AND CLINICS

Aspen/Larch Project
Livestock Area Open House
Specialists on Hand to Answer Questions
Exhibits and Displays

Visitors who arrive before 10:00 a.m. will be able to take two morning tours.

MORNING TOURS — 9:00 - 11:00 a.m.**HORTICULTURE RESEARCH**

*Blueberry Observation trials.
Junebearing and Day Neutral Strawberry evaluations.
All America Flower Selections for 1986-1990.
Dried Flower and Chrysanthemum evaluations.
Intense management of bell peppers.
Raspberry and Juneberry cultivar evaluations.
Woody ornamental evaluations.*

FORESTRY RESEARCH

*Tree Improvement Nursery — discussion of the important role of the nursery in the University forestry research since the mid 1950s.
Current research work on white pine plantlets produced by tissue culture.
Aspen/Larch Project.*

WILD RICE RESEARCH

*Varietal trials comparing yield and shattering resistance.
Fourth and fifth selections for shattering resistance.
Increase and selection in the Pistillate M3 germplasm population.
Herbicide screening on wild rice and burreed.
Selection for a disease resistant line.*

AGRONOMY RESEARCH

*Wood ash as a liming source.
Developing nematode tolerant alfalfa varieties.
Small grain varieties.*

AFTERNOON TOURS — 1:15 - 3:00 p.m.**FORESTRY**

Tours will go through the Station woodlot. Various aged stands and species of trees will be seen. Stops will be at several field research plots. The Chapman red pine plantation is 95 years old this year.

HORTICULTURE

The tour will visit the Station orchards. Culture, diseases and insect control, pruning, site selection, winter injury and cultivar selection will be discussed using examples from the Station orchards.

AGRONOMY

Tour the research plots at the new research farm, North Central South. Studies include canola, lupine, field pea, amaranth and forage grass varieties and species.

ANIMAL SCIENCE

Walking tour of research facilities including swine, beef and dairy.

Horticulture Night

You are invited to North Central Experiment Station Horticulture Night on Wednesday, August 29, from 4:00 to 7:00 p.m. Continuous walking tours of the horticulture area will be conducted and experts will be available to explain the plots and answer questions.

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

Prepare Your Calves For Marketing

Dan Brown, Assistant Animal Scientist

With the calving season wrapping up and cattle moving to pasture, we need to look ahead toward fall marketing of feeder calves. Are there management tools you should investigate to capitalize on feeder prices? Early weaning, preconditioning and creep feeding can affect calf weights and your profits this fall.

The typical downward market from August to November and weight price differentials give an advantage to earlier weaned calves. When you start with a 600-pound calf, a 35-pound gain is required for each \$5/cwt drop in feeder price. This only creates equal per head prices. Feed costs are above that. Slow growing and feed efficient poor cattle, calves on poor pastures and low milking cows are prime candidates for early weaning and sale.

Preconditioning programs don't have the popularity in some portions of the country they once did. Checking into cost of the program and securing a market which will give a premium should be first priority. For each \$20 invested in a program for a calf, initial weight 600 pounds, a \$3.50/cwt premium or a 21-pound gain must be achieved to simply break even. Be sure to include feed costs, veterinarian costs and labor when investigating a program.

Providing supplemental grain or high quality forages to calves while they are still on pasture is another management procedure fitting for some producers. Creep feeding can add 30 to 60 pounds at weaning, usually taking 8 to 12 pounds of feed per pound of gain. October feeder futures markets around 82 cents and feed prices at 5 to 7 cents per pound create a profitable calf-feed price ratio, but shouldn't be the determining factor.

Other advantages of creep feeding include less set-back at weaning and higher salvage value of cows. Studies have shown a 20 to 30-pound heavier cow weight at weaning if calves were creep fed. On the other hand, creep feeding decreased the ability to recognize maternal characteristics of the cow herd and excess fattening of heifers during this period reduces lifetime productivity of those retained for replacements.

Creep feeding gives the greatest benefit to herds with poor milkers, large numbers of first calf heifers or aged cows, those on marginal quality pasture during late summer and late born calves. By the time late calves are old enough to utilize grass, the pastures are usually in a lower nutrient state. Genetically initiated fast growing calves respond well to creep feeding. Likewise, bull calves benefit more than steers and heifers.

When pastures are in good condition, it may be of no benefit to creep feed. But if

the same cattle are expected to be on poor pastures later in the grazing season, creep feeding should be explored and initiated while grass is plentiful to have calves established on the supplement by the time they need it.

High energy creep rations are needed early to mid summer since nursing and quality grazing provides adequate protein intake at that time. Protein levels should be raised to around 14 percent later in summer and into the fall, as other feedstuffs will be lacking in this nutrient.

For producers that are finishing their own calves or holding calves over on high fiber rations, creep feeding isn't usually profitable. Other producers should appraise the nutrition level of their pastures throughout the grazing season and evaluate the cow herd to see if they may benefit.



Management option plans like creep feeding and early weaning work well together to give maximum weight calves during high price periods. None or all of these options may be profitable for your operation. Each should be examined and implement those that will maximize your profit.

1989 Annual Stative Cultivar Trials

Kay L. Sargent, Assistant Scientist

Annual stative is an important fresh cut and dried flower. Cultivar selection becomes more important as the industry expands and competition increases. Our goal in this one year study was to evaluate stative cultivars for field production in the upper midwest. This is the second year the North Central Experiment Station has had field trials of annual flowers for dried flower production. On a broader scale, we have conducted trials of annual flowers and chrysanthemums for over two decades.

Over 40 stative cultivars were seeded in the greenhouse in March. Established seedlings were vernalized to initiate flowering before transplanting to the field in early June. Ten plants per cultivar were set in rows 4 feet apart with one-foot spacing within rows. All ten plants were used in the cultivar evaluations and five plants were harvested weekly from mid-July through September for production information. Samples were dried in a dark air-conditioned room with no supplemental heat.

Marketable stems were defined as good



quality and 16 to 17 inches in length. Maximum stem length, measured in the field in August, was often much longer. Total stem count included shorter stems and unmarketable stems (deformed or discolored flowers, bent stems). Cultivar evaluations included measuring the size of the primary flower heads, rating stem arrangement, fresh flower quality and dried flower color.

Characteristics important to good flower quality are large flower heads, large and open calyxes, close calyx placement within the flower head, intense and even color. Color quality after drying and storing stative for a few months was rated with emphasis on color retention. These traits are important in producing a quality product. Most cultivars, except some apricot and rose stative, showed high flower quality and good color retention.

Stem arrangement, a reflection of growth habit, affects post harvest handling and product use. The upright type is easier to harvest as stems tangle less readily than an open plant. Also the smaller vertical spread between primary, secondary and tertiary flower heads presents a more marketable appearance. Spreading stems reflect an open plant habit. This plant type has more unmarketable, bent stems.

In this study the number of marketable stems per plant was low for many cultivars. The percentage of marketable stems could be increased in three ways. First, harvest more often. Weekly harvests are too infrequent, especially for light colored cultivars which show discoloration more readily. Secondly, avoid planting shorter cultivars which produce a high percentage of short

stems. Finally, manage static to prevent the flopping or bending of stems by selecting more upright cultivars, planting in beds to provide support from other plants and staking when necessary.

Early maturity is also important for static production in cool climates. Our date of first yield indicates the date the first marketable stem was cut. Short stems were often harvested prior to this date. Some low yielding

cultivars were simply too late for our season. Earlier planting dates and season extenders such as raised beds, black plastic mulch, and row covers may increase earliness and perhaps yield.

Static is usually sold on a weight basis in the wholesale fresh and dried flower market. Variation between cultivars as to stem weight prompted us to calculate the number of stems per ounce. Overall dry

weight ranged from 23 to 33 percent of fresh.

This annual static cultivar evaluation was intended to be an indicator of cultivar performance in northern climates. Your climate, microclimate, cropping system and market will influence your choice of cultivars and affect your marketable yield.

For more detailed information on individual cultivar results, contact the North Central Experiment Station.

Summary of annual static cultivar trial.

Color	Stem arrangement ^a	Stem length (in)	Head size ^b (in)	Fresh flower quality ^c	Date of first yield	Yield per healthy plant				Marketable stems/oz	
						Total stems	Marketable stems	Fresh weight (oz)	Dry weight (oz)	fresh	dried
Yellows	2.2	22.6	3.0	6.8	7/27	31.4	9.8	4.89	1.59	2.0	6.2
Roses	1.9	20.8	2.6	6.5	8/6	21.1	6.8	5.36	1.44	1.3	4.8
Light blues & purples	1.0	22.6	2.5	7.6	8/9	20.0	8.5	7.38	1.92	1.2	4.2
Whites	1.0	25.3	2.6	7.8	7/31	19.8	8.0	7.02	1.84	1.1	4.3
Dark blues & purples	1.1	21.2	2.6	7.5	8/11	17.6	7.3	7.57	1.84	1.0	3.8
Apricots	1.7	22.3	2.4	6.7	7/30	8.0	1.2	.89	.28	1.4	4.8

^a 1 - upright, 2 - upright & open, 3 - spreading

^b Length of primary flower head

^c 1 - poor, 9 - excellent

Suggested static cultivars.

Yellow	Rose	Light Blue and Purple	White	Dark Blue and Purple	Apricot
Gold Coast	Market Rose	Twilight Lavender	Fortress White	Soiree Deep Blue	Apricot
Soiree Yellow	American Beauty	Twilight	Soiree White	Soiree Purple	Fortress
Sunburst Yellow	Rose Light	Sky Blue	Sunburst White	Purple King	
			Iceberg	Royal Purple Monarch	

University of Minnesota/Institute of Paper Science and Technology Aspen/Larch Genetics Cooperative

Gary W. Wyckoff & Egon Humenberger

Thirty-six years of cooperator sponsored tree improvement activities were transferred to the University of Minnesota in July 1989. Formerly located in Appleton, Wisconsin, the genetics work was part of the Institute of Paper Chemistry, a research, education, and information arm of the pulp and paper industry. Following a decision to build new facilities and relocate the IPC (now the Institute of Paper Science and Technology) staff and students to the Georgia Tech campus in Atlanta, Georgia, a host organization was sought to house its forest genetics program. Interest in retaining the research was expressed by organizations in Michigan, Wisconsin, and Minnesota, leading to a series of discussions and the decision to relocate in Minnesota. The programs are now part of the University of Minnesota Department of Forest Resources and are housed at the North Central Experiment Station.

Aspen tree improvement work was initiated in 1954 by a group of Lake States pulp and paper companies interested in fundamental breeding to examine the potential of improving wood and fiber characteristics as they relate to paper.

Larch tree improvement work began in 1980 to develop an alternative softwood fiber source. A cooperative effort from industry and public agencies has provided financial support over the years, and that support continues.

Work with both aspen and larch has the objectives of increasing growth rate, improving wood and fiber properties, increasing disease resistance, and developing trees adaptable to a variety of sites. Trees meeting a high selection standard are bred under controlled conditions and tested to compare particular combinations of males and females. Although a tree's phenotype (visible characteristics) provides a basis for selection, its genetic value cannot be judged from appearance alone, and therefore must be determined from progeny tests. These tests provide information for heritability, genetic correlations, and genetic gains for traits meeting cooperative objectives.

Hybridization is another major aspect of aspen and larch tree improvement activities and is based in part upon the expression of heterosis (hybrid vigor). Hybrid vigor refers to the exceptional performance

of offspring of genetically different parents, performance significantly greater than the average of the two parents. For example, the hybrid from a trembling aspen and a similar aspen in Europe will produce about twice the wood of either parent under the same growing conditions. Other advantages of hybridization include a potential for increasing the size of the gene pool making it possible to extend the range of a species, and bringing desirable characteristics found in separate species together.

Further gains in growth and wood quality are expected to come from second generation breeding and more immediately from clonal selection and propagation. Individual trees within populations of aspen and larch (as well as many other species) possess highly desirable characteristics. When these characteristics are the result of a specific arrangement and interaction of genes on a chromosome, they are referred to as non-additive (meaning not sexually transmissible). The only way to capture and exploit non-additive characteristics is through asexual propagation; that is,

continued on back page

Quarterly Report

Robert F. Nyvall, Superintendent

Our crops are in and the alfalfa is growing very well. We had a minimum of winter kill but the fields are bright yellow with dandelions. This weed or salad makings (depending on your viewpoint, the leaves make an excellent green) seems to be omnipresent this spring.

We have moved our first beef cattle out to the Hauser property south of town. This land, purchased about four years ago, will be known as North Central South. Sound confusing? Beside our expanded agronomy plots, the 200 acres will be used for beef nutrition research. In the future we plan to expand our beef herd to accommodate this type of research.

Congratulations to Tom Carpenter who received this years Outstanding Civil Service Award. Tom is one of the most energetic and innovative people I know. He is constantly thinking of new ways to cut labor costs, make a job easier to do or otherwise seeking ways to improve the Station. His latest and most obvious endeavor will be a huge U of M sign planted in flowers on the side of the hill by the greenhouse. This "sign" will be very obvious from Highway 169. Tom is proud of the Station and his pride shows in his work.

Construction of the new aspen/larch greenhouse is slated to begin this summer. It will be built on the site of the old Superintendent's house. Construction will also include a headhouse that will house offices and experimental equipment. The greenhouse will be primarily used to facilitate research on genetically improved aspen and larch. Fifty acres of land are being purchased to accommodate an arboretum for this project. Hats off to Gary Wyckoff, project leader, and Jim Boedicker, agricultural engineer, for all their hard work on this project.

We have received legislative funds to construct a combination field laboratory/machine storage building on North Central South. We appreciate all the work Repre-

sentative Loren Solberg and Senator Bob Lessard did in securing this funding for the Station. The legislature has stipulated that only two thirds of the construction costs will be covered by legislative funding. This means we must raise the remaining one third of the cost. This will be difficult but I'm confident it can be done.

An assistant professor at the Ph.D. level will be hired to fill Larry Simonson's tourism position. This person will be budgeted 60 percent extension and 40 percent experiment station. A Ph.D. forest geneticist will also be hired this year to work on the aspen/larch project. We are looking forward to acquiring these additions to our staff.

The Station is in a new and exciting period of growth. Hope to see you all at our Visitors Day on July 19.

Aspen/Larch *continued from page three*

making identical genetic copies by rooting a part of the tree, a process called cloning.

The tree improvement cooperative's reforestation activity is based on seedlings from controlled pollination seed or open-pollinated seed collected from stands. The cooperative is also developing greenhouse and nursery techniques for large-scale seedling production and working to provide site selection guidelines and plantation establishment techniques.

The genetic material that provides the basis for the aspen and larch tree improvement work is still in transition from 80 acres of arboretums and test trials near Appleton, WI. A site near Grand Rapids, MN, has been purchased for the transfer and re-establishment of the genetic material, a process anticipated to take five years. Additional funding has been acquired to build a greenhouse, headhouse, office, and laboratory facility on the NCES grounds; ground breaking is expected to take place later this summer.



Employee recognition awards were recently presented to NCES employees. Pictured are Tom Carey, Superintendent Nyvall and Kay Sargent. Others receiving awards were Tom Carpenter, Gordy Bickford, Henry Schumer and Dan Carey. The awards, presented to Civil Service employees at five-year employment intervals are a new program at the University this year.

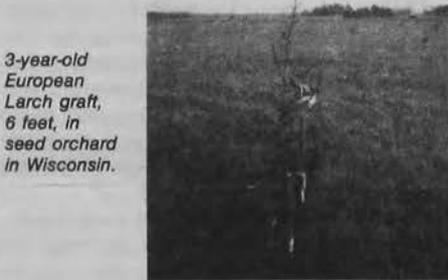


Ray Graupmann, dairy herdsman, retired recently after 16 years of service to the Station. He was honored at an employee coffee party. Best of luck to you and Shirley in your retirement, Ray!



Canola oil varieties

Horticulture plots



3-year-old European Larch graft, 6 feet, in seed orchard in Wisconsin.

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