

The North Central Quarterly

Published by the North Central Experiment Station of the University of Minnesota

PAUL CENTER FOR GRAND RAPIDS, MINNESOTA

JULY 1988

VOLUME 58 NUMBER 3

This is Your Invitation to:

VISITORS DAY, THURSDAY, JULY 21, 1988



Secretary Faye Mostoller registering one of the over 300 visitors to the Station at the 1987 Visitors Day.

11:00 to 1:00 LUNCH

Available at the Itasca Community College Cafeteria.

9:00 to 11:00 a.m. CONTINUOUS WAGON TOURS

- Agronomy Research Plots
- Horticulture Research Plots
- Tree Improvement Nursery and Shiitake Mushrooms
- Wild Rice Research Plots

1:15 to 3:00 p.m. CHOOSE ONE TOUR

- Bus Tour to Agronomy Plots
- Wagon Tour to Forestry
- Walking Tour to Blueberry Plots
- Walking Tour of Animal Science Facilities

ALL DAY EXHIBITS AND CLINICS

- Weed-Disease-Insect Clinic
- Livestock Area Open House
- University of Minnesota and Itasca Community College Information
- Visitors who arrive before 10:00 a.m. will be able to take two morning tours.
- Specialists will be on hand to answer questions all day.

MORNING TOURS

AGRONOMY RESEARCH

- Alternative crops for northern Minnesota*
- Small grain varieties*
- Alfalfa nematode research*
- Ash as a lime and/or fertilizer*

HORTICULTURE RESEARCH

- Blueberry observation trials*
- Intense management of bell peppers on raised beds*
- Cultural studies with day neutral strawberries*
- Evaluation of broccoli, cauliflower, red cabbage, sweet corn and peppers*
- Junebearing strawberry cultivar evaluations*
- Annual flower and chrysanthemum cultivar evaluations*
- Woody ornamental evaluations*

Dried flower evaluations

Raspberry cultivar evaluations

WILD RICE RESEARCH

- Second and third selections for shattering resistance*
- Crossing blocks to determine the heritability of certain traits*
- Giant Burreed development and maturity*
- Chemical screenings to control the wild rice worm*

FORESTRY RESEARCH

- Tree improvement nursery — varieties of conifer and hardwood species evaluated for hardiness, growth characteristics, survival rate and disease and insect problems*
- Shiitake mushroom feasibility*
- Growing Shiitake mushrooms on five Minnesota log species*

AFTERNOON TOURS

FORESTRY

See various aged plantings along the wagon tour route with examples of management such as thinning, site preparation and woodlot management for fuelwood and other forest products. A ski and hiking trail has been developed through our woodlot.

HORTICULTURE

An informal walking tour will be held in the blueberry research area. Stops will include the breeding observation trials, winter snow depth studies, winter protection studies, bird protection studies, advanced replicated yield studies and other points of interest.

ANIMAL SCIENCE

A walking tour of the animal science research facilities including swine, beef and dairy.

AGRONOMY

Tour the research plots at the new research farm. Studies include canola, lupine and forage.

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

Understanding Timber Supply

Howard M. Hoganson

Minnesota's forest resource is vital to the state's economy. The value of forest products manufactured in Minnesota is more than \$2.5 billion per year. Many Minnesotans are employed in forestry and forest industries. But can we utilize the forest resource to an even greater extent? In the past this has not been a difficult question to answer. But with the addition of several new paper mills and several new board plants, expansion opportunities are not so evident. More attention is needed to the type of development and the potential impact on existing industry and landowners. Unfortunately, it is more difficult to understand northern Minnesota's timber supply situation and the forest management and policy options available than one might initially expect.

Physical Versus Economic Supply

Inventories of Minnesota forestlands give estimates of the existing wood volumes currently in the state, but this data alone is difficult to interpret. Significant volumes of wood are not available to the market at current timber prices. This might be because the timber is inaccessible to the existing road network, located far from a mill, owned by landowners with objectives other than timber production, or simply of poor quality or in such small amounts that harvesting would not be profitable.

In economic terms, timber supply is a schedule that shows the quantity of timber that landowners are willing to sell at each possible price during a specified time period. Considering this general definition, it is apparent why an understanding of timber supply is extremely important for evaluating the current forestry situation. For example, the impact of a mill expansion on the existing supply could be measured as simply the increase in price that would be needed to increase the harvest level to the higher production level. However, after we look at the concept of timber supply in more detail, it will become apparent why such a simple concept in theory is so difficult to estimate and apply to the Minnesota situation.

Long Production Periods

Unless timber production methods change significantly rather soon, all of the trees that will be harvested in Minnesota during the

next thirty years are already growing today. In other words, our existing forest must supply our timber needs for the next thirty years or more. Therefore, in evaluating economic timber supplies we must be concerned with not only today's situation but also with the impact of today's actions on the economic timber supply for many future years. Estimation procedures must consider how timber stands change (grow) over time and how management actions will affect future growth. The procedures must also consider the demand for timber and how demand and supply interact to determine the quantity of timber harvested. Predicting timber demands is extremely difficult. Errors in estimating the quantity of timber harvested in any one period are carried forward and cause errors in the estimates of the timber supply for future periods.

Joint Products

What do we mean by "timber" supply? Timber is used to produce a wide variety of products. Some products require much different timber than other products, and yet some timber can be used for several products. Typically we are more concerned with the economical supply of specific types of wood like red pine saw logs or aspen pulpwood. Two points are worth noting along these lines. First, individual forest stands produce multiple products that often come as a package. Separating the management costs to the individual products is impossible. From an analytical viewpoint, this means that the analysis of one product must be done in conjunction with the analyses of the other products. If we also recognize the many nontimber products of the forest, like wildlife and recreation, then the analysis can become extremely difficult.

Because timber products come as "packages," an increased demand for one product can have a complementary impact on the supply costs for other timber products. For example, an increase in fuelwood use might make it profitable to harvest some mixed-species stands that could not be harvested profitably without the additional revenue generated from the sale of fuelwood. The volumes of higher-valued products from these mixed stands could be significant and thus the quantity supplied to the market could be increased

without an increase in the price. With these types of relationships possible, it is apparent why we need to gain a better understanding of the timber supply situation.

Spatial Concerns

The cost of transporting wood to market is often an overriding factor in determining whether a stand is marketable. In northern Minnesota, more money is often spent on transporting the wood to the market than is spent on buying the rights for harvesting the wood (stumpage) from the landowner. Even the type of product end-use sometimes depends on the stand's location. For example, even if the wood in a stand meets the pulpwood requirements of the nearest pulp mill, it still might be more profitable to sell the wood for fuelwood if fuelwood markets are located much closer to the stand.

Spatial interdependencies between stands also complicate the analysis of timber supply. For example, consider the implications of building a new road. Building the road makes a number of different timber stands accessible. To accurately evaluate the value and timing of roadbuilding options, management options for all stands must be considered simultaneously. This greatly complicates the analysis of specific options for individual stands. Other factors like time of harvest (winter or summer), wildlife impacts, and compatible-use considerations also have the same type of complicating interactions.

Computer Models

Computer models have the potential to help us gain a better understanding of the large and complex problems associated with the forest management and utilization opportunities in northern Minnesota. Simulation models offer the potential to help identify and evaluate impacts of possible management strategies and policies. Optimization models can potentially help landowners develop management plans that maximize their objectives. A primary objective of future forestry research at the University of Minnesota North Central Experiment Station will be to develop computer modeling methods that are applicable to the forestry situation in northern Minnesota. □

COMING EVENTS

Horticulture Night, Wednesday, August 31, 1988,
4 to 7 p.m.

Dairymans Day, Thursday, January 12, 1989

Horticulture Night

You are invited to North Central Experiment Station Horticulture Night on Wednesday, August 31, 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.

Improving the Odds in Haying

James J. Boedicker

According to the Minnesota Agricultural Statistics Service, the state ranked second in the U.S. in hay production in 1986 with nearly 9.7 million tons, 79% being classified as alfalfa. As for total crop value, hay (\$517 million in 1986) ranks third in Minnesota behind corn and soybeans. Almost a fourth of the state's hay is produced in an 18-county area of north central and northeast Minnesota that roughly comprises the "service area" of this Station. In this area, only half of the hay produced is classified as alfalfa, but this percentage could increase in the future, as the use of ash as a low-cost lime/fertilizer source becomes more widespread.

Most of the hay grown in Minnesota is fed on farms where it is produced, but the portion being marketed as a cash crop is increasing. This trend is expected to continue as farmers become more specialized. Dairymen, for example, are buying more of the hay they need instead of producing all of it themselves, and some produce none.

One of the principal concerns in making dry hay is maintaining quality from cutting through packaging. Quality has always been important but for hay that is marketed, the concern for quality is more immediate, given its influence on price.

A main inhibitor to successful haymaking is unfavorable drying weather after cutting. The longer hay must lie in the field before becoming dry enough to package, the lower its quality and harvested yield are likely to be. Losses in hay quality between cutting and packaging result largely from

loss of dry matter through (1) shatter of high quality leaves as can occur in raking and other operations, (2) leaching of soluble nutrients by rain and (3) respiration, i.e. the loss of sugars, starches and other carbohydrates through plant metabolic activity. Sometimes hay is baled too wet and unless a suitable preservative is used, severe losses can occur after packaging as well.

One key to preserving quality of cut hay is minimizing drying time in the field. The first major breakthrough for reducing drying time was the development in the 1940s and '50s of the mechanical conditioner which crimps/crushes the stems to allow moisture to more easily escape. More recently, chemical drying agents have been introduced and can substantially reduce drying time even more in some situations. In the meantime, various types of tedders, fluffers and windrow turners have come on the market and these can help speed drying as well. Presently a new type of machine is in development at the University of Wisconsin that completely macerates hay forming a thin mat which reportedly will dry in 3 to 7 hours for a true "hay-in-a-day" approach. Commercialization of this concept, however, now appears at least several years off.

While there are numerous ways to reduce hay drying time, the bottom line, as with all other crops, must be profitability, whether the hay is direct marketed or not. Practically anything done to speed drying has some cost attached to it. A tedding or fluffing operation, for example, will increase



drying rate but does involve additional cost in equipment, fuel and labor; besides the added leaf loss that can easily occur in the operation. Economic analysis of any treatment or operation is confounded by uncertainties regarding the weather but is incomplete without consideration of weather related risks.

At this writing, a proposal by the Department of Agricultural Engineering is pending with the Minnesota Agricultural Experiment Station to investigate the effectiveness and economics of various hay prepackaging operations to increase drying rate. Included in the proposal is work to evaluate performance of conditioners, rakes, windrow turners, fluffers and chemical drying agents for effects on drying rate, losses and quality. The work would concentrate on alfalfa and would take place at different locations around the state including this Station. If approved, field activities will begin this summer. □

School of Agriculture Reunion

According to Tom Carpenter, reunion chairman, over 100 early registrations have been received for this year's reunion. The reunion will be held on Saturday, July 23, 1988, starting with an open house at the North Central Experiment Station from 12 to 3 p.m. in the afternoon. Festivities will move to the Sawmill Inn on Highway 169 South in Grand Rapids for a social hour and registration at 5:00 p.m. A buffet dinner at 6:00 p.m. and a program will follow. A dance with good ol' time dancing music will start at 9:00.

Clem Griffith's scrapbooks and many class pictures will also be available for alumni to see.

In addition to the former students, all current employees and former employees and instructors are also invited to attend the reunion. Bring a spouse or guest and plan to have a good time.

Cost for the dinners at the Sawmill is \$11.00 each. Former students are asked to send \$2.00 Alumni Association Dues. Send your name, address and the year of your graduation along with your check to Tom Carpenter, North Central Alumni Association, 1861 Hwy 169 East, Grand Rapids, MN 55744. If you are unable to attend, let us hear from you. Letters will be welcome.

Robert F. Nyvall, Superintendent

I invite everyone to come to Visitors Day on July 21. As you can see much of this issue deals with the day's events.

The word here is dry. Although the first hay crop will be okay, a second cutting is looking more and more questionable every day unless we get rain and a lot of it. Our experimental plots are looking exceptionally good considering the lack of moisture. Of course, where we can irrigate we are doing so.

I may have mentioned the good press the Experiment Station received in the past legislative session regarding our Blandin Cogeneration ash studies and blueberry research. I think this is indicative of the recognition our researchers deserve as the experts in their area of research. More good news in this respect; Dr. Dave Wildung has been invited by Chinese scientists to spend a month in China this fall to advise Chinese researchers on blueberry research and possibly other problems. We are extremely proud of Dave for this honor.

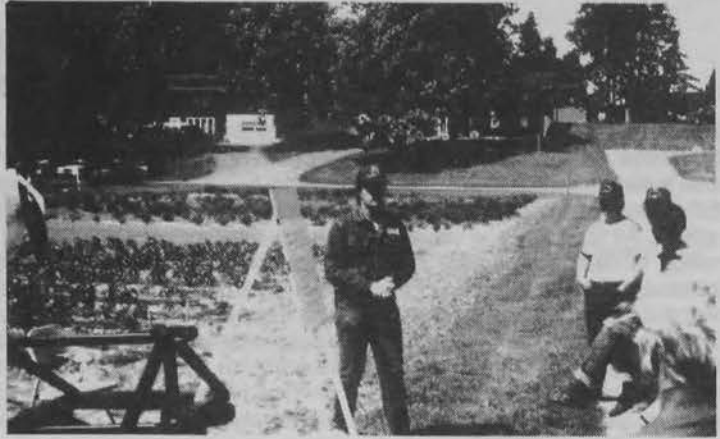
We are still in the interviewing process for our marketing and wild rice positions as we go to press. Hopefully we'll have people in these positions before Visitors Day.

Although we were not appropriated money by the legislature for building, we are doing some much needed remodeling of the swine barn. Wooden walls were rotting out due to the constant moisture from washing. These walls will be replaced by concrete.

See you at Visitors Day. □



Dr. Bob Stucker, project leader for the wild rice plant breeding and genetics project, discusses present research and future goals with a tour group at the 1987 Visitors Day.



Dr. Vince Fritz explains raised beds and mulches for vegetable crops.



Small grain variety demonstration plots will be seen on the morning agronomy tour.



One of the afternoon tours will be a walking tour through the animal science facilities.



Dennis Carlson discusses differences in 1952 planting of red, white, jack pine and balsam fir.



Don Pierce explains aspen regeneration and its value to wildlife.

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Issued by
THE UNIVERSITY OF MINNESOTA
 North Central Experiment Station
 1861 Hwy. 169 East
 Grand Rapids, Minnesota 55744

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Published February, April, July, November
 ISSN 0199-6347
 by the North Central
 Experiment Station,
 Grand Rapids, Minnesota

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