

mn 1030 NCCQ - Vol. 55:1

The North Central Quarterly

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

GRAND RAPIDS, MINNESOTA

FEBRUARY 1985

VOLUME 55, NUMBER 1

Developing Blueberry Potential in Northeastern Minnesota

David K. Wildung

For the last few years North Central Experiment Station (NCES) and the Department of Horticultural Science with the support of the Minnesota Agricultural Experiment Station and the Blandin Foundation of Grand Rapids have worked toward the development of winter hardy blueberry cultivars for Minnesota. The first cultivars from this program (Northblue and Northsky, see *North Central Quarterly*, April 1983) were released in 1983. The uniqueness of this plant type offers potential Minnesota producers opportunities to grow blueberries commercially for the first time.

In early December word was received that the Governor's Council on Rural Development had awarded \$32,700 to the Itasca Development Corporation (IDC) for a project to develop commercial blueberry potential in northeastern Minnesota. The proposal was submitted jointly by IDC, the Itasca Greenhouse at Cohasset, NCES and the University of Minnesota Extension Service.

The proposal combines the best of public and private operations. IDC and the Itasca Greenhouse will be utilizing agricultural research from the University to develop a new industry in Minnesota. The Greenhouse will be growing blueberry plants in containers. These containerized plants will in turn be sold to potential commercial producers to demonstrate this unique new crop for Minnesota agriculture. If the greenhouse growing phase is successful, it can eventually become self-sufficient as a nursery producer of blueberry plants for the state. The proposal also provides for the training of rural producers through Agricultural Extension. NCES is involved with the training of both the Ag Extension Agents of northeastern Minnesota as well as potential producers. If the project is successful commercial blueberry production in Minnesota could become a reality. The agricultural economy of the state would be improved through plant sales, fruit sales, marketing and allied agricultural enterprises.

Currently there is no producing commercial blueberry acreage in the state. The first commercial acreage was planted in 1983 when NCES initiated feasibility studies at five grower-cooperator sites in northern and west central Minnesota. In 1984, three more sites around the Twin Cities were added to our program. These grower sites are one-half and one acre plantings and the growers are supplying economic information that we are utilizing to develop blueberry economic figures and



Pick-your-own blueberries.

production guidelines. Establishment and second year growing costs are now summarized for these studies. The first fruit at these grower sites may be harvested this coming season.

The goals of the Governor's Council Grant are for the Itasca Greenhouse to produce 20,000 blueberry plants in 1985 that would in turn be sold to producers identified by the Extension Agents in northeastern Minnesota. It is hoped that 20 producers who would grow one-half acre blueberry plantings will be part of this program. It takes about 1,000 plants for a one-half acre commercial planting (at a spacing of 6½ feet by 3¼ feet) so a total of 10 acres of commercial blueberries would be planted. The potential for many more producers and acres is certainly possible. While the potential producers will be identified in late winter-early spring, the plantings would not go in until spring 1986. Growers will use 1985 for preparing their sites and conducting any soil modification practices necessary. Growers would also be asked to supply information on their operations to be used to develop further production guidelines.

Work on the project is already under way. Itasca Greenhouse has now started over 7,000 plants and the remaining plants will be growing by May 1. The Greenhouse, NCES and Cloquet foresters are jointly cooperating on a project to evaluate various containers that will maximize blueberry plant growth in the greenhouse. Root trainers (Tinus and Hillson),

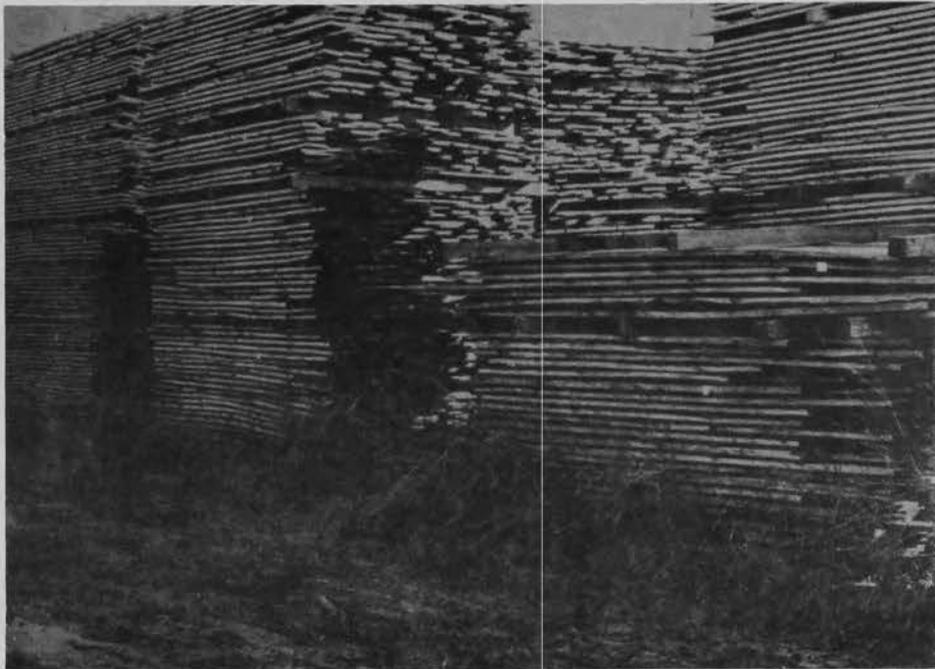
styroblocks, removeable plastic cells, two sizes of paper pots and Nissula Rolls (rolled poly sheets with rooted plants spaced one foot apart in peat media) are being compared to plants grown bare-root in peat beds without any containers. Growth rates are being evaluated so production schedules can be determined. Early planted blueberry plants appear to be doing very well and the greenhouse should be able to produce a very good field ready plant in less than a year.

On January 24, the Extension Agents from northeastern Minnesota gathered at NCES for a day of training on blueberry culture, propagation and background material. NCES developed a slide set on blueberry culture that the agents can use in presenting their county meetings. The agents also received material on production guidelines (Blueberry Production in Minnesota AG-FO-2241), economic information (Feasibility Studies on Half High Blueberries in Minnesota), a list of commercial propagators of the Minnesota hybrid blueberries and other materials for distribution to the public at their county meetings.

The county agents will be presenting informational blueberry meetings on this project in their counties sometime between Feb. 1 and mid-March. After these meetings potential producers will have an opportunity to apply for the right to purchase plants through the project. All applications must be in by March 15. At this time producers will be selected by

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



Poor air drying practices such as depicted here cause high losses by degrading, foolishly wasting valuable lumber.

Elm-A Resource Worth Utilizing

Thomas Milton, Area Extension Agent,
Forest Products

If you have access to some dead or dying elm, before you cut the whole tree into firewood, why not have the sawlog quality trunk portions sawn into lumber. Its value has risen dramatically in the last year or so, for one reason. The Wisconsin Forest Products Price Review (March 1984) reports 4/4, rough, green #1 Common, American elm lumber selling for \$520/MBF at the mill. This compares with black ash at \$580, aspen \$250, white birch \$308, hard maple \$320, and red oak \$610, for the same grade and specs.

Another reason is Dutch elm disease (DED) in no way affects the wood's properties. Elm wood, whether disease-killed or not, is strong and beautiful if processed promptly. American elm heartwood is light brown, often with a red tinge, and the annual rings are ring porous, which produces a distinct grain like oak or ash. In fact, most people can't tell the difference between oak and elm. Elm is moderately heavy, hard, stiff and has high shock resistance. Elm is not naturally durable but it is readily treated with preservatives. Elm has excellent bending properties and therefore is often used for the rockers of rocking chairs. Elm is also used for furniture of many styles, cabinets, truck beds, pallets and many other products.

A Note of Caution

Elm bark beetles are the carriers of Dutch elm disease and utilize the bark of dead and dying elm trees as breeding sites. The most effective means of suppressing the disease is to eliminate the beetles' breeding sites. This can be accomplished by chipping, debarking, burning or burying. Thus to control the spread of DED, diseased elm wood including logs,

firewood, and sawmill slabs, should not be carried over to a new growing season (past April 1) unless the material has been debarked, or otherwise used. There are some small debarkers on the market that attach to most chainsaws, which make debarking a lot easier.

Drying Elm (and other Hardwood) Lumber

Green lumber must be properly dried before it is usable. One problem you may encounter when drying American elm

lumber, is that it is more prone to crook and warp than other hardwoods. This tendency is caused by three elm characteristics that cause abnormal shrinkage behavior: interlocked grain, "wetwood" pockets of high moisture and the fact that elm lumber typically comes from large limbs that lean and thus contain high amounts of tension wood.

To prevent these drying defects from occurring during air drying or kiln drying, it is essential to follow careful piling practices (described later). And with elm in particular, sticker spacing should be reduced to 12 inches to 18 inches maximum, coupled with a top load of at least 50 lbs/square foot.

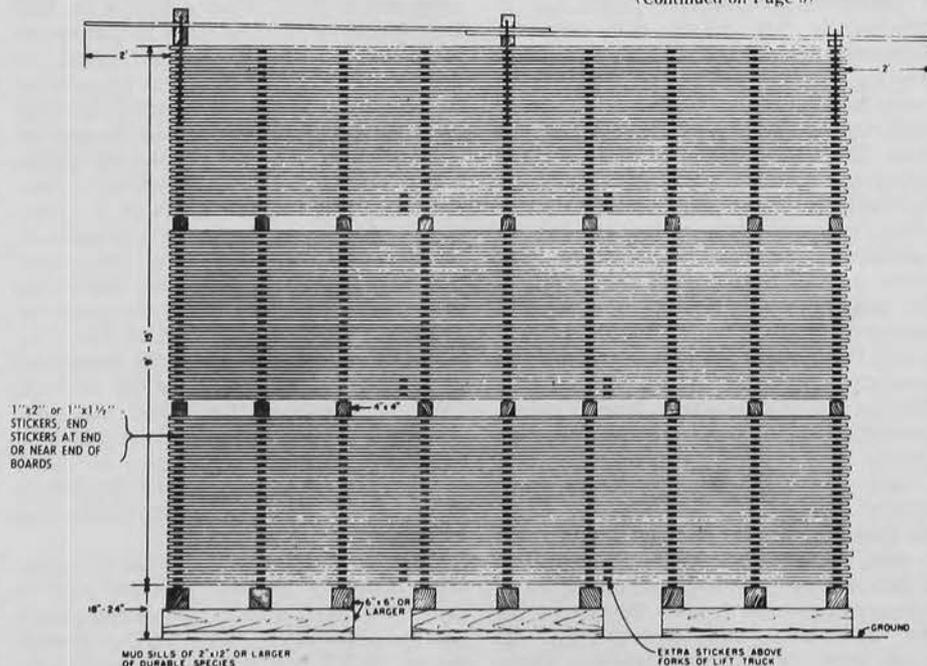
Drying Small Quantities of Lumber

Probably the most practical and easiest method of seasoning small quantities of lumber is the two-step process of air drying developed by the U.S. Forest Products Lab. The first step involves stacking the lumber outdoors to take advantage of favorable drying conditions for a period of one to six months or until the wood has dried as far as it can. For small quantities of lumber cut in the fall or winter, faster drying could be achieved in Minnesota by stacking it in a heated building for the entire process.

In addition to the season of the year and general climate of the area, wood species, thickness, grain pattern, yard layout and piling methods are other factors affecting the drying rate.

How can you tell when your lumber is dry? To determine whether your lumber is as dry as it is going to get, accurately weigh several sample pieces every 10 days. When you have noted no further decreases in weight for several periods, your lumber is as dry as it can be when

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Features of a properly stacked lumber pile are illustrated here. Note the adequate ground clearance, removal of weeds, closely spaced carefully aligned stickers and sloped roof. A top load of 50 lbs/sq ft should also be used, particularly with hardwoods or warp prone species. Taken from Ag. Handbook No. 402.

Elm-A Resource

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stacked outdoors. The moisture content of the wood after this outdoor drying period should be about 15 to 20 percent. A moisture meter can also give you the moisture content and they are fairly accurate below 30 percent moisture content.

The second step is intended for lumber which will be used indoors, such as for furniture or trim. To reduce the moisture content further, the lumber must be re-stacked in a building that can be heated at least 20 degrees F above the outside temperatures of the winter months. A dry basement or heated garage would be ideal. Lumber should be thoroughly dried to 6 to 8 percent moisture content before it is manufactured into various interior products.

Lumber Piling Checklist

The more closely you follow the piling practices listed below, the fewer defects you can expect.

- Lumber should be stacked immediately after sawing.
- During warm weather, it is a good idea to dip or brush treat freshly sawn lumber with an antistain treatment to prevent bluestaining.
- Locate lumber pile(s) in an area where air can circulate freely around the stack(s).
- Pile at least 12 inches from the ground on a firm foundation; the higher the better.
- Foundation supports should be directly under each vertical line of stickers.
- Stickers should be uniform in size (1 inch thick by 1½ inches wide) and dry to prevent stain.
- Stickers should be stacked every 12 to 18 inches and in line with adjacent layers.
- Separate boards of different thickness and pile only those boards of the same thickness in each layer.
- Make certain the ends of boards are supported with stickers.
- Vertical flues are helpful in promoting air circulation; so every 14 to 16 inches within each layer, allow a 2 to 4 inch space.
- Construct a roof (preferably a sloping roof) of exterior plywood, old boards or corrugate sheet metal to prevent re-wetting of the lumber.
- Apply a load (rock, blocks, etc.) to the roof to reduce warping in the upper layers of lumber. (A load of at least 50 lbs/sq ft is recommended.)
- Coat the ends of the lumber with paraffin, asphalt roof cement, or a commercial end coating to reduce end checks.
- Keep weeds and grass mowed and don't allow debris to accumulate near piles.

Where to Find Electric Moisture Meters and Relative Humidity Instruments

Have you been thinking about buying an electric moisture meter? Or maybe you wish you had a hygrometer or psychrometer to measure the relative humidity in



"Weatherman" James C. Anderson has recorded over ten years of observations at the North Central Experiment Station. He recently received a 10-year service pin from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, for his volunteer work in recording the data at North Central. Jim is an accountant at the experiment station.

Weather, 1984

James C. Anderson

From a weather standpoint, the year got off to a good start. January 1984 was over 7 degrees warmer than the incredibly cold December it followed. The two record highs (42 and 43 degrees) recorded in the first week in January were especially welcome since we had not enjoyed above-freezing temperatures since the middle of November. Cold temperatures later in the month served to remind us that we were still in the middle of a Minnesota winter. February temperatures were almost unbelievable for this part of the country. After the tenth, the thermometer never dipped below the zero mark and every day except one was warmer than normal; several reached highs in the 40s and on the twenty-third we recorded a 53-degree temperature. Only 2 inches of snow fell during the month. We had only 6 inches of snow cover at the end of February; about one-third of what could be expected. Temperatures in March were closer to normal with one-half of an inch of precipitation in the first half of the month. Then the rain quit . . . for 41 days.

Even though April was over 7 degrees warmer than average, a little snow managed to fall on the last day. This

your workshop, dry kiln or storage area. A list of suppliers of these instruments is available from Tom Milton (218-327-1790). Also available is an excellent publication entitled "Electric Moisture Meters for Wood" which will help you understand how moisture meters work, their limitations and how various factors affect their accuracy.

This article is reprinted from the MINNESOTA FOREST PRODUCTS MARKETING BULLETIN, Vol. 27, No. 4.

three-tenths of an inch brought the season total to 56.3 inches which is about average for Grand Rapids. It was, however about three and a half feet less than fell on the Twin Cities of Minneapolis and St. Paul.

Our summer got off to a normal start, but the 7.44 inches of rain in June changed that. Most of this near-record rainfall occurred early in the month and saturated the soil to the point where it reduced growth in annual crops such as corn and small grains. In low areas standing water caused considerable crop loss. After the June rains, dry weather took over for a few weeks, reducing the yield of many perennial forage crops. Neither July nor August delivered even one-half of the normal rain for this area. A warmer than usual August (6.8 degrees warmer than average) proved to be very favorable for the maturation of full season crops. The first frost of the fall season was recorded on September 26, less than a week after a record-breaking 88 degrees on the twentieth. The rains (over 5 inches) we would have liked in mid-July and early August fell in October.

The year of 1984 closed on a relatively calm note. November and December temperatures were near normal. As of the end of December, the snowfall totalled only 10.3 inches. This less-than-normal snowfall when combined with a warm spell and rain in the middle of December left us with only 3 inches of snow on the ground at the close of 1984. The mean temperature for the year was 40.1 degrees which is 2.3 degrees above average. Precipitation, despite the fluctuation from monthly averages, totalled 25.14 inches, only 1.15 inches from our 30 year average of 26.29 inches.

Efficient Production Methods Emphasized at Dairy and Beef Days

Efficiency in our cattle production systems was emphasized at the recent Dairymans Day (January 9) and Beef Cow-Calf Day (January 30) held at the North Central Experiment Station. It is evident that if dairy and beef producers are to maintain a competitive edge during times of tight economic margins they must pay very close attention to such management factors as nutrition and feeding, crop production, selection, animal health and record keeping.

Dr. Jim Linn, Extension Dairy Specialist, stated that nutrition is the single most important factor in determining milk production since feed accounts for over one-half of the cost of production. He pointed out that high producing herds and cows continue to be the most profitable.

The most important factor influencing milk production is the quality of forages. The quality of forage affects the intake potential, the digestibility of the feed and the efficiency of utilization. Forages high in cell wall (fiber) content are poorly digested and decrease forage intake. The maturity of the forage is the most important factor influencing dry matter intake and milk production. Research has shown that dairy cows will consume over 3

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a committee made up of agents and NCES staff. During April those selected will have an opportunity for more training. Site preparation during 1985 will then lead to the 1986 planting time.

While the immediate goal of the project is to find twenty producers and plant ten acres, the long term goal is to aid any potential producer and establish commercial blueberry acreage in Minnesota. Through the funding of the Governor's Council on Rural Development this project is off to a good start. We are excited about the future prospects this project offers. If you are interested in becoming a blueberry producer and live in northeastern Minnesota contact your County Extension Office for information about the meetings in your county. NCES will also be happy to supply further details about this project.

pounds of dry matter per 100 pounds of body weight per day of legume-grass hay if it is cut at the prebloom stage, while consumption can be expected to decrease to near 2.5 pounds per 100 pounds of body weight per day if the hay is allowed to reach full bloom. The value of the more mature forage is further reduced due to the lower amount and digestibility of the protein in the more mature hay. This would suggest that for dairy farmers it is very important that hay making should begin at an early date even though there may be a greater danger of the hay being rained on. Remember that every day that the hay is standing results in a decrease in quality and feed value.

Proper balancing of the ration for energy, protein, minerals and vitamins is important for an efficient, cost effective feeding program. To properly balance the ration one must first analyze the forage and then use the more expensive grains and protein supplements to balance the ration.

The quality of the forage fed to beef cows is not as critical as is the case with high producing dairy cows. However, the efficiency of production is reduced when poor quality forage is produced. For the beef herd the forage quality becomes even more important when feeding young growing steers and heifers.

Dr. Ray Arthaud and Dr. Jay Meiske pointed out that there are a number of factors which affect the efficiency of beef cattle. Some of the factors include the calf's weaning weight, the dam's milk production, calf weight weaned per cow exposed to breeding and the final product weight per unit of energy consumed. For the cow-calf producer, the easiest and most useful measure of efficiency is probably the weight of the calf at weaning. The efficient operator will need to couple this with the cost of production since the bottom line is the net return per cow-calf unit.

The importance of record keeping was emphasized at each of the meetings. Records should cover the entire farming operation including the cost of producing crops and crop yields as well as such items as breeding records, calf weaning weights and cost of machinery operation.

Rust Returns to Animal Science Position

Dr. Joe Rust has resigned as Superintendent at the North Central Experiment Station effective when a new Superintendent is selected. Dr. Rust has been Superintendent at the Station since the death of Superintendent Matalamaki in 1978. He will remain on the North Central Experiment Station faculty in the position of Animal Scientist. Dr. Rust previously held the animal scientist position from 1965 until he became Superintendent in 1978. Dr. Tom Heeg, who was animal scientist after Rust became Superintendent, left the University recently to go to a position in private industry in Wisconsin. A search committee appointed by Director Sauer has reviewed applications for the Superintendent's position. Interviews with the candidates will be scheduled soon and an appointment should be made this spring.

REMEMBER REUNION

Make your summer plans to attend the All-Class Reunion of the North Central School of Agriculture on July 20, 1985, at the Grand Rapids Holiday Inn. Further details and a registration form will be in the April Quarterly. Let's make it a big one!!

Coming Events

Visitors Day

Thursday, July 18, 1985

North Central School of
Agriculture All-Class

Reunion — July 20, 1985

Horticulture Night

Wednesday, Aug. 28, 1985

The North Central Quarterly

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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Second-class postage paid at Grand Rapids, Minnesota