

FINAL REPORT

PRODUCTION AND MARKETING OF
RED PINE FOR MILLWORK

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Production and Marketing of Red Pine for Millwork

Final Report for Minnesota Technology, Inc.

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Objective: To facilitate increased use of red pine and similar species as a usable raw material for higher added-value millwork applications.

Background: The secondary millwork market in Minnesota employs nearly 8,000 people. Resource availability of western woods, the primary wood raw material for the millwork industry, has shrunk. This resource availability issue is the primary driver for this research. The tasks are: analyzing the raw material availability, identifying and evaluating processing considerations, and to develop and implement marketing strategies.

Goal: The project goal is to provide the information needed to produce higher value-added products from native wood resources, helping current and new wood products manufacturers penetrate the millwork industry with native raw materials, and creating new manufacturing jobs.

Justification: This project is relevant to both primary and secondary woodworking industries in Minnesota. The existing industrial millwork market is largely located in the upper Midwest. These window and door producers in Minnesota traditionally have relied on ponderosa pine as their raw material. The declining supply of western species and increasing prices created the need to better utilize regional species. Using regional species for millwork can provide assurances that the raw materials needed for this industry will be available. Clear millwork components carry a higher relative value than construction grade materials. The information developed will be used by existing Minnesota firms or new firms who wish to enter these value-added markets.

Work Completed: Resource supply has had a profound effect on national lumber markets and created widespread political debate. These timber supply concerns have driven traditional users of western pine to seek substitute species from other producing regions. Severe pine shop lumber shortages and drastic increases in pine shop lumber prices, created an atmosphere which prompted regional window and door manufacturers to move quickly in accessing and in using a variety of pine species being offered to them as alternatives to the diminishing supplies of western pine.

Regional pine (white and red), as well aspen, became alternative species which interested all regional manufacturers. By developing our regional timber resources and by facilitating the creation of engineered wood products the upper Midwest has an excellent opportunity to increase the number of jobs and to expand its economic base.

The diminishing availability of clear western softwood cut stock for use by the window and door industry cannot be fully met by the limited supplies from regional species or the surge of imported pine product. This not only led to increased demand on regional pine for cut stock but also led to the development of, and investment in, specialized veneer laminating technology to supplement solid cut stock supply. This project has focused on how to achieve the highest economic benefit from the available resources. As a research and development manager at Andersen Corporation, Bayport, Minnesota, stated in a correspondence: "While we are looking at numerous species, those such as Red Pine grown in the lake states offer us some advantages in inventory control, transportation cost, and time of delivery."

Technical Results: If we expect red pine to be accepted as an alternative to western pine cut stock its properties must be identified and compared to ponderosa pine. These questions were quickly answered by the regional manufacturers who served as industrial cooperators for the project. The years of experience of the project's industrial cooperators was key in successfully answering research questions and appropriately applying regional species to value added millwork applications. By working with industry, a comprehensive list of properties important for alternative species acceptability was developed. This check list of properties is outlined below:

1. Level of pitch bleed and extractives
2. Proper kiln drying to 6-12%
3. Color, grain and texture similar to ponderosa pine
4. Ability to hold paint and accept stain
5. Resistance to splitting and weather-checking
6. Dimensional stable and has little warping
7. Mechanical fasteners hold equal to ponderosa pine
8. Resistance to decay and current wood preservation treatment effective
9. Easily glued
10. Machines well
11. Can be processed into veneer

The above properties are of varying importance, depending on the application. To relate these characteristics to an application, five board grades were defined for regional cut stock. These grades are listed below and can be used as a general guideline for Minnesota manufacturers who wish to research the feasibility of this market.

Sash Grade Intended for use where the wood is highly visible. The surface is normally seen from the interior of finished product and could be clear sealed.

Sash Paint Grade This surface is viewed from the exterior and may contain characteristics that are covered after the primer has been applied during the manufacturing process.

Frame Paint Grade	This grade is normally used as a frame member viewed from the outside, and is painted over with a top coat grade of paint after the unit has been installed. Fasteners are usually applied through these surfaces, may contain characteristics that require slight touch up prior to the final top coat grade of paint being applied. After final top coat has been applied, defects will not be visible.
Unexposed Grade	Used on frame parts and other areas where a final finish is not applied and/or defects are not visible once a unit has been installed in a rough opening. The characteristics of this grade will not have a detrimental effect on the structural strength of the unit.
Concealed Grade	The grade may contain a number of characteristics that will not be visible due to the way the part is used in assembly. Parts may be covered by cladding or concealed in some manner. Appearance or structural strength is of little importance in this grade.

Some of the important properties to the research objectives are discussed below as they relate to the outlined grades.

Pitch Bleed and Extractives: The higher level of extractives (pitch or resin) in red pine versus ponderosa pine will always be a major influencing factor in nearly all of the physical properties important to the window and door market. Pitch influences painting and staining and may be controlled by specialized high temperature kiln drying schedule to set the pitch.

Proper Kiln Drying to 6-12%: The proper drying of red pine for use in other than Sash Grade or Sash Paint Grade was found to be within the technical abilities of the existing kiln drying industry. Drying research and the development of the kiln schedules to successfully cure pitch, which would enhance the chances that clear red pine could be used as an alternative to ponderosa pine for Sash Grade applications, was beyond the budget and technical scope of this project.

Color, Grain and Texture Similar to Ponderosa Pine: Red pine's grain and texture is considered medium coarse compared to the finer texture of ponderosa pine. Even if the pieces are clear, red pine appearance may not be acceptable if combined with ponderosa pine in the same multiple piece unit, especially in a highly visible application. Thus red pine cannot be considered Sash Grade, unless built into a stand alone unit.

Ability to Hold Paint and Accept Stain: The high level of extractives make it generally more difficult to stain and paint than ponderosa pine. In work with Valspar, Inc., Minneapolis, Minnesota, significant progress was made in overcoming the technical problems of factory finishing of traditionally hard to finish regional woods.

Resistance to Splitting, Dimensional Stability and Fasteners: Red pine has showed good mechanical properties in terms of split resistance, dimensional stability and mechanical fasteners. Markets for red pine Frame Paint Grade, Unexposed Grade, and Concealed Grade have been developed and several high volume applications have been approved by the window and door industry.

Resistance to Decay and Current Wood Preservation Treatment Effective: Red pine has acceptable decay resistance. Current wood preservative treatments are effective which make red pine as durable as ponderosa pine.

Easily Glued: The extractives in red pine do make gluing more difficult than ponderosa pine. However, with the proper glue joint preparation, the window and door industry had little problems when using polyvinyl acetate glues. Some difficulty was seen when bonding red pine with hot melt glues. One project cooperator found that by elevating the surface temperature of the wood prior to glue application, the hot melts produced an acceptable bond.

Machines Well: As a medium density texture wood, red pine is easily machined. The only problem found was higher tool wear due to the excessive level of pitch. A smooth sanded finish on red pine can be achieved with 120 grit sand paper.

Available as Veneer: Lake States red pine and white pine both appear to make an acceptable alternative to western pine veneer. When red pine is used as veneer the level of extractives appears to be less of a problem due largely to the intense drying which occurs in a veneer dryer.

As stated earlier, aspen is another regional species which generates a good deal of interest from the industry due its availability and price. However, a manufacturer interested in the application of aspen found that there was no commercially effective treating system for aspen. As part of this project, we treated some aspen with a chemical not tried by the manufacturer but with little success. The effective treatment of aspen was considered beyond the scope of this project but offers a future research challenge which would have a large positive impact on the value of aspen cut stock.

Business Development and Technical Assistance Results: As part of the project, marketing and manufacturing technical assistance was provided to several cooperators. Emphasis was put on matching companies using cut stock to in-state companies interested in manufacturing. As shop lumber prices escalated (a 60% increase from July 1992 to May 1993) technical issues originally of highest priority became secondary to the availability of Minnesota producers capable of manufacturing cut stock. Andersen Corporation, Bayport, Minnesota, the largest window and door manufacturer in the world, suggested the need for two or three in-state concentration yards and remanufacturing centers to dry and remanufacture white pine and red pine.

One cooperator who has been assisted in the project, Cass Forest Products, Cass Lake, Minnesota has continued to grow as a cut stock supplier to Andersen Corporation. Cass Forest Products made a commitment several years ago to begin producing cut stock. In several cases this project has directly developed the contacts for Cass Forest Products to gain new contracts to remanufacture regional pine and aspen into window cut stock. These contracts have been a factor in a recent expansion to house a new finger jointing line at Cass Forest Products.

In order for the red pine cut stock business to grow, in-state manufacturers must have detailed information regarding finger jointing readily available to them. As part of the project, a finger jointing costing model was developed. This can be used as a pricing and revenue projection tool to assist Minnesota firms who wish to enter the finger jointed cut stock business. This costing model was provided to two central Minnesota firms and used in making decisions regarding the purchase of finger jointing production equipment. This costing model was expanded to include the industrial cut stock business in general. As part of this project we have developed a cost allocation model for the cut stock business, which will help advise clients on strategies for further development of markets for products made from all Lake States low density softwood and hardwoods.

To increase the value of the long clear red pine pieces, this project worked with one firm who sorted out veneer flitches from their red pine cut and assisted them in the conversion and the economics of producing these flitches into veneer for the millwork market. All firms who manufacture pine cut stock should strongly consider sorting the veneer grade clears from their production output.

This project provided assistance in process technology and equipment selection guidance to a Minnesota firm who in early 1993 made a major capital investment in a veneer laminating technology. This project also provided process technology and equipment selection guidance to many cooperators.

As part of the project, technical assistance was provided to Wadena Saw Mills (WSM), Wadena, Minnesota. WSM operates a softwood remanufacturing and truss plant. As an outcome of our assistance WSM has decided to pursue development efforts of a engineered wood product in a different building product market segment. In addition, this work has lead to a new MTI-NRRI development project for rural western Minnesota.