

December 1972



FOREST PRODUCTS UTILIZATION

TECHNICAL REPORT No. 4.

SAWING FROZEN TIMBER WITH CIRCULAR HEADRIGS

For many sawmill men, a freezing temperature is the signal to shut down operations and wait for more favorable conditions. Sawing frozen logs is probably the severest test a mill can face, yet many mills operate successfully in the winter. What makes the difference? The following suggestions may help your operation in cold-weather sawing.

Keep Mill in A-1 Running Condition. To have a mill in A-1 condition requires the following: Solid, well-braced foundation; guide rail alined straight; rails level; saw guide pins adjusted so they clear the saw plate by about 1/32 inch on each side while it is running; saw tensioned for correct speed (could be tensioned for 100 rpm more than actually run); arbor level; saw plumb and snug fitting on the arbor; collars and lug pins undamaged; carriage free of side play (check guide wheels and axles); track cleaners in use and working properly; lead adjustment reduced to absolute minimum; bits and shanks tight fitting with square edges; V-belts in sufficient number, alined, and tensioned adequately; headblocks level, knees in alinement, and free of backlash; setworks free of slack and in otherwise good working order. This list is by no means complete but includes those items that are most commonly at fault when a mill becomes cantankerous in cold-weather sawing.

Saw Only Cleaned Logs. Sawing logs with frozen grit and dirt in the bark is just like applying an abrasive wheel to the saw. This dulls the teeth extremely fast, and it is imperative that teeth be kept sharp at all times for winter sawing. Preferably, logs should be debarked. For smaller operations, a grit-gouger can be used. This device plows a line ahead of the saw, removing any grit or dirt in the saw line.

Feed the Carriage at Its Proper Rate. The natural tendency while sawing frozen logs is to back off on the stick. This generally causes problems. For one thing, it produces finer sawdust which generally slips out of the gullet more easily and thus forces the saw off line. Feeding the carriage at its proper rate will produce sawdust (actually chips) 1/8 to 1/10 inch long. These chips will then be more apt to stay in the gullet chamber and discharge properly rather than sticking to the board or the side of the log.

Supply Adequate Power to the Saw. One researcher reports that it requires 16 percent more power to saw frozen logs. This is probably true since you are sawing ice, literally. Required power at the headsaw is determined, basically, by several interrelated factors: bite, hardness of wood, saw speed, cant face width to be sawn, width of saw kerf, saw feed, and tooth style.

Reduce Width of Saw Kerf 1 to 2 Gages. Frozen wood generally cuts more cleanly than unfrozen wood. The saw will therefore not heat as easily. A narrower kerf will also demand less power, thus offsetting somewhat the increased need for power for sawing frozen wood.

Keep Saw Teeth Tight in Their Sockets. Loose saw teeth have a tendency to creep forward and cause the saw to pull hard. Sockets can be closed up by hammering ever so carefully on the shoulder. In some cases loose or worn shanks can be stretched by peening them on both sides near the gullet edges.

Decrease Saw Speed by 100 RPM. Saw speed can be decreased 100 rpm by installing a larger pulley on the arbor. Reducing saw speed has three distinct advantages in sawing frozen timber. First, it reduces the impact of the tooth on the wood which results in less fine fractured sawdust. Second, it results in proportionally more tension in the saw which allows it to absorb more rim heat without saw plate distortion. And third, it results in more torque on the saw arbor, allowing adequate feed to be maintained more easily. Be sure the arbor is stout enough to withstand the increased load. When saw speed is reduced for winter sawing, DO NOT have the saw retensioned for the slower speed.

Use a Special Winter Tooth. Most manufacturers of saw teeth make a special winter tooth that they claim helps while sawing frozen logs. Most of these teeth are designed with a nub projecting into the normal gullet area to deflect sawdust away from the flange of the shank. This breaks up the normal swirling action of the sawdust as it chambers in the gullet. Swirling sawdust in the gullet is thought to be one of the reasons why sawdust sticks in freezing weather. Heat generated by the cutting action of the sawing process and from friction of the fast-moving sawdust particles causes a partial melting of the ice. As the sawdust comes to rest, the water quickly refreezes and thus sticks to the board and/or cant which forces the saw off line.

For smaller operations that may be underpowered, every other tooth can be inactivated by filing or grinding the cutting edge back to the saw plate. This results in only half of the original number of teeth functioning, thus making it easier to produce coarse sawdust with the available power. When this is done, the carriage must be fed at a slower rate. DO NOT remove every other tooth from the saw to accomplish this effect as correct saw tension will be destroyed.

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For further information on this subject and other areas of forest products utilization, contact your State Forester who cooperates with the U.S. Forest Service in providing direct assistance to forest landowners, loggers, and wood processing firms.

These technical reports are issued by State and Private Forestry. Suggestions for topics for this report can be forwarded to Forest Products Laboratory, P.O. Box 5130, Madison, WI 53705.

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