

JACK PINE

Cover Type Guidelines

HARVEST SYSTEMS AND ROTATION AGES

1. Clearcut at the end of the rotation:

<u>Site Index</u>	<u>Rotation Age</u>
70+	50+ years
55-70	45-50 years

2. Seedtree: Leave 10 well-distributed, desirable quality seed trees per acre with an abundant supply of serotinus cones. Prescribed burning is recommended to consume the slash, kill the competition, prepare favorable seedbeds, and open the serotinus cones on the seed trees to seed the area. (Manager's Handbook, GTR-NC-32)

Remove live seed trees after successful seedling establishment to prevent the seed trees from developing into wolf trees and to reduce the chances of the seed trees becoming reservoirs for *Diplodia* and *Sirococcus*, two fungi which can cause serious damage to seedlings and saplings.

REGENERATION SYSTEMS

Planting both bare root stock and container grown seedlings is the preferred regeneration method when clearcutting. Direct seeding can also be done; 3 oz. per acre of coated seeds is generally the recommended amount. Seeding is usually done by helicopter in the spring of the year. Scattering and burning slash can also regenerate the site, but results will be erratic.

CULTURAL PRACTICES

Release - Jack pine is intolerant and should be released the year after planting, if needed.

Thinning - Maintain the basal area between 70 and 100 square feet per acre. On better sites with a site index greater than 60, thin to increase the production of sawbolts. Thin from below to take out the intermediate and suppressed classes, as they help to sustain a jack pine budworm population.

Wolf Tree Removal - Schedule open-grown stands with basal areas less than 70 square feet for immediate harvest. Stands with greater than 70 square feet of basal area but with scattered open-grown wolf trees should have the wolf trees removed to help manage the jack pine budworm.

Conversion - Convert stands with site indices less than 55 to other species.

PEST CONSIDERATIONS

The major insects attacking jack pine are jack pine budworm, *Choristoneura pinus*; the pine tussock moth, *Dasychira pinicola*; the Saratoga spittlebug, *Aphrophora saratogensis*; white pine weevil, *Pissodes strobi*; and bark beetles, *Ips* spp. A common insect but of lesser importance is the pine spittlebug, *Aphrophora cribrata*. Insect damage includes deformed stems from weevil and spittlebug attacks, top-kill from budworm defoliation, and tree mortality from bark beetle and spittlebug attacks or from heavy defoliation by budworm and tussock moth.

The major diseases of jack pine include heart rots, particularly *Phellinus pini*; *Armillaria* root rot, *Armillaria* spp.; and the gall and stem rusts caused by *Cronartium* spp. and *Endocronartium harknessii*. *Armillaria* root rot and the North American strain of *Scleroderris*, not yet present in Minnesota, have the potential of causing widespread mortality in all ages of jack pine. *Phellinus pini* causes about 90% of the heart rot in all ages of jack pine, and this decay becomes more prevalent as the trees get older. Gall rust can cause seedling mortality, and the stem rusts can deform the boles, lowering their quality for sawbolt material. Mortality to pole and sawbolt size trees can also occur from the stem rusts.

Jack pine has more insect and disease problems than any other native pine species; consult with the Regional I&D Specialist when managing for jack pine.

Control strategies for the budworm and the tussock moth are as follows:

1. Use direct control strategies for budworm and tussock moth control in stands which are not salvageable or stands in which populations have built up high enough to cause damage. Consult the Regional Pest Specialist for specific control recommendations.
2. Large-crowned, open grown trees (wolf trees) and trees in the suppressed and intermediate crown classes contribute to a budworm build-up due to the high production of staminate cones. Therefore, maintain an optimum stocked stand, between 70 and 100 square feet of basal area to reduce the numbers of wolf trees and suppressed trees.
3. Stands with a site index of at least 55 should be favored in order to maintain vigorously growing stands of jack pine.
4. On good sites, 60+, and where economically feasible, thin jack pine from below to reduce the proportion of suppressed and intermediate trees. Thin to 80 square feet of basal area, and thinning should be done as soon as a commercial sale is possible.
5. Where economically feasible, cut out the wolf trees in the stand.
6. Do not store mature jack pine on the stump. Rotation ages, based on budworm considerations, should be between 45 and 50 years. On only the very best sites, 70+, should jack pine be held longer than 50 years. The poorer the site, the earlier the harvest should be.
7. Break up large, extensive stands of jack pine with 2 to 5 chain wide buffer strips, hardwood

stands, white spruce, or larch plantings. These will help to disrupt the dispersal of the budworm. Even-aged stands of jack pine should not exceed 20 to 40 acres. Do not break up the jack pine stands with other species of pine. During a budworm outbreak, other species of pine will be damaged by budworm feeding and may even aid in carrying over a budworm population during the low point of its population cycle.

Heart rot control strategies are as follows:

1. The major entry points for heart rotting fungi include mechanical wounds in the bole, rust cankers, dead branches or dead and broken tops. therefore, when intermediate cultural activities take place in jack pine stands, care should be taken to avoid wounding the residual trees.
2. Priority for harvesting should be based on stand condition and stand age as follows:
 - a. Stands with bole wounds or with broken and damaged tops possibly from adverse weather conditions should be given a high priority for harvesting, and
 - b. stands at or beyond the recommended rotation age should have a high priority for harvesting.

Rust Control strategies include:

1. Culling out seedlings with rust infections, particularly with galls on the main stems;
2. In areas of sweetfern, (the alternate host to sweetfern stem rust), consult with the Regional Insect and Disease Specialist to consider regenerating species other than jack pine.

WILDLIFE CONSIDERATIONS

Jack pine has an overall rating of moderate to good for wildlife, and is the best native pine species for cover when the trees are young. Jack pine has good seed and browse values.

PREFERRED SITE CONDITIONS

Jack pine is a low moisture and nutrient demanding species and is typically managed on somewhat poorly to well drained sand, loamy sand, and sandy loam textured soils. This species requires a minimum of an 18" rooting zone free of root restricting barriers such as saturated soils, bedrock, or very dense soil horizons. The pH range should be between 5.5 and 7.0; this species does not thrive well on soils with high CaCo₃ concentrations (Ph 8.0+) at the surface.

Even though jack pine is a low moisture and nutrient demanding species, it can grow very well on rich, finer textured soils (even silty and clayey textures) if these soils have at least 18" of well aerated rooting zone. Jack pine does not compete well with the typically denser vegetation found on these richer sites.