

Tree Series



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Site Preparation and Tree Planting for Forest Production

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Non-industrial private landowners play an integral part in producing and maintaining forested lands that can meet future demands for timber and fiber products. To have plantations that can provide these resources and products, landowners must give careful attention to how they are established and maintained over the years.

Preplanting planning

Begin by doing a little planning before taking any action. Ask yourself a few questions that can help to avoid complications or disappointments:

- Why do I want to establish the tree plantings? How will the land be used while the trees are growing?
- What efforts am I willing to put into establishing healthy plantings—and later, maintaining a healthy forest?
- What are the capabilities and liabilities of my land (e.g., soil composition and drainage, climate, common insect and disease problems)?
- What tree species will most effectively help me meet my personal goals? If wood production is one of my goals, what timber values can I anticipate at harvest time?

Once you've answered these questions, you can consider possible tree species that would best fit your location. Suggestions for species that grow in various regions of Michigan are provided in Table 2 at the end of this publication. The most important conditions to keep in mind are average soil moisture conditions and soil texture. Your choice of tree species might also be determined by availability of tree stock at your local nursery, deer browse concerns and attractiveness to desirable

wildlife. One of the best ways to understand whether your choices will be successful is to observe how those same species grow on other properties in your local area. Also, check the grass and weed situation. If the site supports a heavy weed and grass cover, it can grow either hardwoods or conifers. If the site can't grow much of a weed or grass cover, it won't grow hardwoods very well, either. In that case, conifers would be better suited to your site.

Once you have decided on your site and the tree species to plant, be sure to determine the number of seedlings to obtain by considering the spacing of the plantings (Table 1). Spacing varies with tree species. Conifers should generally be planted closer together than hardwoods. If conifers are planted too far apart, there won't be enough competition between trees. They tend to develop large, low branches that lower their future timber value.

Table 1. Seedling spacing and trees per acre.

Seedling type	Spacing (between-row x within-row)	Trees/acre
Spruces	10 x 6 ft.	726
	or 7-8 x 8 ft.	779-680
Pines*	6-7 x 6-8 ft.	1,210-778
Hardwoods	10 x 8-10 ft.	545-436

* Closer spacing (6 x 6 ft.) is especially recommended for white pine to counteract the negative effects of white pine weevil.



Additionally, more closely spaced plantings will typically reach crown closure faster, resulting in fewer insect and disease problems. Generally, however, hardwood species can be planted a little less densely. The number of seedlings needed can then be calculated on the basis of the recommended spacing.

Site preparation and seedling care

The amount of site preparation needed before planting often depends on the soil type. If the site is relatively sandy, no preparation may be necessary. On loamy or fine-textured soils that have thick grass or weed cover, some mechanical and/or chemical weed control should be done in the fall before planting. Follow-up weed removal the year of planting may also be necessary. Perennial grasses, broadleaf weeds and brush should be controlled by using herbicides or physically removed by "scalping" or scraping away the vegetation and some soil in a 24-inch-wide zone centered on the row. Avoid creating completely exposed soil conditions near waterways or on steep slopes to minimize erosion of topsoil. Heavy existing vegetation may require mowing followed by an application of a commercial weed killer before planting. Refer to MSU Extension Bulletin E-2754, "Controlling Broadleaf Weeds and Grasses for Plantation Site Preparation".

NOTE: When using any herbicide, be sure to read all label instructions.

Spring is the best time to plant. Moist soil and mild temperatures give the trees the best conditions to become well established over their first growing season in the field. Purchasing and transporting the seedlings to the planting site, however, is a delicate process. Careful handling of trees during the time from the nursery to planting is critical. Often, seedling deaths are blamed on poor tree quality or poor planting, when they were actually a result of mishandling. It is important to plant seedlings as soon after acquisition as possible, preferably within a few days. In the meantime, keep them cool and moist. Seedling roots are especially fragile and must be kept protected from hot or dry conditions. Dry roots mean dead trees.

Postplanting considerations

Weed control after planting is essential to ensure successful planting establishment, especially for hardwoods. To keep weeds from competing with your seedlings, you can use mulching, mowing or chemical applications. Although the mechanical methods of mulching and mowing are considered effective, control may require four or five operations per year. This can become expensive. Using herbicides may be more economical, and it can be safe for the environment and tree seedlings if chemicals are properly applied. Refer to MSU Extension Bulletin E-2752 for more information.

Once your planting is established, it will still require periodic pruning, thinning and insect/disease checks. Watch for browsing or clipping injuries that may suggest animal damage. When checking for damage from insects or disease, look for shoot tips, needles or leaves that look yellowed, mottled or withered. Among young conifers, pay close attention to the most common insect damage from sawflies, budworms or tip weevils. Look for discolored, distorted or dead shoots and buds. Common insecticides can often take care of pest problems, but be sure to consult with a public service forester or local Extension specialist before coming to any conclusions. Occasionally, nutrient or water deficiencies create similar symptoms in foliage. In this case, pesticide applications would be futile in solving the problem.

Remember, your new forest is going to be with you for a long time. Establishing trees is merely the beginning of the process. The rewards, however—whether they be financial or otherwise—will far outweigh the costs if the proper procedures are taken.

Other *Tree Series* bulletins:

E-2752, Herbicides for Year-of-Planting Weed Control in Hardwood and Conifer Plantations

E-2754, Controlling Broadleaf Weeds and Grasses for Plantation Site Preparation



Table 2. Suggested tree species by moisture needs, soil type, region* and wildlife value.**

Species for wet (poorly drained) sites

Sandy soils (coarse texture)			Loamy soils (medium texture)			Clayey soils (fine texture)		
Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife
Cottonwood	SLP	F	Poplar (hybrids)	All	F	Swamp white oak	SLP	E
Poplar (hybrids)	All	F	Basswood	UP	G	Green ash	All	G
Tamarack	All	G	Black spruce	NLP, UP	G	Silver maple	SLP	F
			Red maple	All	F			

Species for moist (well drained) sites

Sandy soils (coarse texture)			Loamy soils (medium texture)			Clayey soils (fine texture)		
Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife
White pine	All	E	White ash	All	G	Green ash	All	G
Red pine	NLP, UP	F	Black cherry	All	E	White spruce	NLP, UP	G
White spruce	NLP, UP	G	Black walnut	SLP	E	Black cherry	All	E
Black spruce	NLP, UP	G	Tulip poplar	SLP	G	Tulip poplar	SLP	G
Norway spruce***	All	G	White oak	NLP, SLP	E	White oak	NLP, SLP	E
Bur oak	SLP	E	N. red oak	All	E	N. red oak	All	E
			White pine	All	E	Bur oak	All	G
			White spruce	NLP, UP	G	Sugar maple	All	F
			Sugar maple	All	F	Red maple	All	F
			European larch***	All	G			

Species for moderately dry sites

Sandy soils (coarse texture)			Loamy soils (medium texture)			Clayey soils (fine texture)		
Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife	Species	Regional suitability	Wildlife
Jack pine	NLP, UP	E	White pine	All	E	Black oak	SLP	E
Red pine	NLP, UP	F	Red pine	NLP, UP	F	Shagbark hickory	SLP	E
White pine	All	E	Jack pine	NLP, UP	E			
Black cherry	All	E	White oak	NLP, SLP	E			
			N. red oak	All	E			
			Black cherry	All	E			

* UP=Upper Peninsula; NLP=northern Lower Peninsula; SLP=southern Lower Peninsula.

** E=excellent for wildlife; G=good for wildlife; F=fair for wildlife. Check with a local forester to discuss options.

*** Not a native species.



Information sources

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