

Forestry Practices Manual

Technical Guide

**Federal Standards &
Iowa Department of Natural Resources
Bureau of Forestry**

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TECHNICAL GUIDE
FORESTRY PRACTICES MANUAL
BUREAU OF FORESTRY
IOWA DEPARTMENT OF NATURAL RESOURCES

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TREE PLANTING

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

Tree planting practices integrate the actual planting or interplanting of tree seedlings, transplants, cuttings or seed and the necessary cultural activities to establish or enhance a stand of desirable forest trees.

PURPOSE:

Tree planting practices are designed to establish a stand of trees suitable for forest products, wildlife habitat, site protection, and/or water quality enhancement.

PLANTING PLAN:

A written tree planting plan approved by the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) is required for all projects of state or federal programs for which the IDNR/BOF has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Species must be suited to soil and site conditions.
2. Planting stock must be from locally adapted seed sources as determined by the IDNR/BOF.
3. Planting stock must have a proper balance of root to top.
4. Use of hardwood seed for stand establishment will be acceptable as determined by IDNR/BOF and as outlined in the Direct Seeding section of this manual.
5. Planting rates for conifers, hardwoods and mixed conifer/hardwood plantations is 500 to 1,450 seedlings per acre. Deciduous shrubs may be included in plantations as a nurse crop for the trees and for wildlife habitat diversification. The IDNR/BOF will determine proper interplanting rates of forested sites for each project.

6. If permitted by the specific cost-share program, a planting plan may incorporate the production of intermediate products (i.e. Christmas trees, firewood, etc.) along with the long term “PURPOSE” (see above paragraph) of planting. Trees (or resulting coppice stock) established for the long term “PURPOSE” must be maintained at a stocking level in compliance with the planting plan, with paragraphs 13 and 14, and must be uniformly distributed throughout the plantation.
7. Acceptable species and minimum planting stock specifications are as follows:

SPECIES	STEM CALIPER	HEIGHT	ROOT LENGTH
EASTERN WHITE PINE	5/32”	8”	7”
RED PINE	5/32”	8”	7”
JACK PINE	5/32”	8”	7”
SCOTCH PINE	5/32”	8”	7”
PONDEROSA PINE	5/32	8”	7”
NORWAY SPRUCE	5/32	8”	7”
WHITE SPRUCE	5/32	8”	7”
BLACK HILLS SPRUCE	5/32	8”	7”
LARCH	5/32	8”	7”
EASTERN RED CEDAR	5/32	8”	7”
BLACK WALNUT	1/4	10”	7”
ASH Sp.	5/32	8”	7”
OAK Sp.	5/32	8”	7”
MAPLE Sp.	5/32	8”	7”
HICKORY Sp.	5/32	6”	7”
Other Hardwoods and deciduous shrubs (as approved by IDNR/FD)	5/32	8”	7”

8. Planting dates:
 - a. Spring planting
 - i. From when the frost is out of the ground until May 31.
 - ii. May be extended as determined by IDNR/BOF based on stock, weather, and soil conditions.
 - b. Fall planting from October 15 until ground is frozen (deciduous species only).
9. For care and planting of seedlings, follow instructions in IDNR/BOF publication “Successful Tree Planting” at www.state.ia.us/government/dnr/organiza/forest/pdf/planting.pdf.)
10. Minimum standards for tree planting approval are 80% compliance with:
 - a. Spacing must be within one foot of management plan specifications both within rows and between rows.
 - b. Proper planting depth:
 - I. Conifers - same depth to 1/2 inch deeper than grown in nursery bed.
 - II. Hardwoods - same depth to one inch deeper than grown in nursery bed.
 - III. Root collars must not be visible after planting.
 - c. Vertically planted such that the top does not lean from vertical by an angle more than 20 degrees.
 - d. Soil must be firmly packed around roots. Test for firmness is to pull from ground without tearing off the smaller roots, the soil is not firmly packed.
 - e. Planting stock specifications (paragraph 7)
11. Control of adversely competing vegetation prior to and/or after planting is essential and compliance with planting plan specifications is required for project approval. Methods of controls include mulch, herbicides, and mechanical practices. For additional information on maintenance and weed control in tree plantings check IDNR/BOF’s “Grass & Weed Control for Tree & Shrub Seedlings” brochure. Get it on the web at: www.state.ia.us/government/dnr/organiza/forest/test/pdf/weeds.pdf.
12. Chemicals used in performing this practice must be applied according to authorized use, label directions, and other federal and state policies and requirements.

13. Plantation survival standards - initial five year establishment period:
 - a. Adequate. 75% survival with minimum stocking of 300 trees per acre. Not eligible (if available) for replanting cost-share assistance.
 - b. Intermediate. 50% to 74% survival with minimum stocking of 300 trees per acre. May be eligible (if available) for replanting cost-share assistance.
 - c. Inadequate. Less than 50% survival and/or a stocking level less than 300 trees per acre. May be eligible (if available) for replanting cost-share assistance.
14. Plantation survival standards - post five year establishment period. Adequacy is determined by IDNR/BOF on individual plantation basis.
15. Requirements for replanting and eligibility for cost-share assistance is determined by survival standards and cost-share program regulations.
16. Protection:
 - a. Domestic livestock must be excluded from planted area.
 - b. Periodic inspections should be made for pest damage and appropriate control measures implemented.
 - c. Firebreaks should be established around the perimeter of all plantings. Internal firebreaks and/or access roads should be established to subdivide plantings into blocks of no larger than 20 acres. Minimum width for fire breaks and roads at end of rows and within the planting is 24 feet with 16 feet minimum width where parallel to perimeter rows.

DIRECT SEEDING

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

Direct seeding establishes a forest through the use of seed rather than seedlings.

PURPOSE:

Direct seeding practices are designed to establish a stand of trees suitable for forest products, wildlife habitat, site protection, and/or water quality enhancement.

PLANTING PLAN:

A written direct seeding plan approved by the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) is required for all projects of state or federal programs for which the IDNR/BOF has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Species must be suited to soil and site conditions.
2. Seed must be from locally adapted seed sources as determined by the IDNR/BOF.
3. Seed can be broadcast, drilled, or row planted.
4. Seeding rates will be designated by the seeding plan minimum rates are as follows:
 - a. Broadcast:
 - i. Oak Sp. – 3 bushel/acre
 - ii. Black walnut – 8 bushel/acre
 - iii. Other species and rates at discretion of DNR Forester.
 - b. Drilling:
 - i. Oak Sp. - 1.5 bushel/acre
 - ii. Black Walnut – 5 bushel/acre
 - iii. Other species and rates as determined by DNR Forester.
 - c. Row method:
 - i. Oak Sp. - .5 bushel/acre
 - ii. Black walnut – 1.2 bushel/acre
 - iii. Other species and rates as determined by District Forester.

5. If permitted by the specific cost-share program, a planting plan may incorporate the production of intermediate products (i.e. firewood) along with the long term “PURPOSE” (see above paragraph) of planting. Trees must be maintained at a stocking level in compliance with the planting plan.
6. Seeding dates will be established in the project plan and set by the District Forester.
7. Control of competing vegetation is essential and compliance with planting plan specifications is required for project approval. For additional information on maintenance and weed control in tree plantings check IDNR/BOF’s “Grass & Weed Control for Tree & Shrub Seedlings” brochure. Chemicals used in performing this practice must be applied according to authorized use, label directions, and other federal and state policies and requirements.
8. Plantation survival standards - initial five year establishment period:
 - a. Adequate. 75% survival with minimum stocking of 300 desirable tree seedlings per acre if drilling or row seeding and 3000 desirable tree seedlings per acre if broadcast seeding. Not eligible (if available) for replanting cost-share assistance.
 - b. Intermediate. 50% to 74% survival with minimum stocking of 300 desirable trees per acre if drilling or row seeding and 3000 desirable tree seedlings per acre if broadcast seeding. May be eligible (if available) for replanting cost-share assistance.
 - c. Inadequate. Less than 50% survival and/or a stocking level less than 300 desirable trees per acre if drilling or row seeding and 3000 desirable tree seedlings per acre if broadcast seeding. May be eligible (if available) for replanting cost-share assistance.
9. Plantation survival standards - post five year establishment period. Adequacy is determined by IDNR/BOF on individual plantation basis.
10. Requirements for replanting/reseeding and eligibility for cost-share assistance is determined by survival standards and cost-share program regulations.
11. Protection:
 - a. Domestic livestock must be excluded from planted area.
 - b. Periodic inspections should be made for pest damage and appropriate control measures implemented.

c. Firebreaks should be established around the perimeter of all plantings. Internal firebreaks and/or access roads should be established to subdivide plantings into blocks of no larger than 20 acres. Minimum width for fire breaks and roads at end of rows and within the planting is 24 feet with 16 feet minimum width where parallel to perimeter rows.

12. Methodology may be modified with approval of the District Forester.

PLANTATION REPLANTING

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DEFINITION:

The replanting practice integrates the actual planting or interplanting of tree seedling, transplants, cuttings or seed and the necessary cultural activities to establish a plantation.

Purpose:

To establish a tree planting that had “inadequate” survival (IDNR/BOF) Forestry Technical Guide - Tree Planting, paragraph 13) due to conditions beyond control of the landowner.

PLANTING PLAN:

A written management plan approved by the District Forester is required for all projects of state or federal cost share programs for which the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. A replanting project is eligible for cost share only if the landowner has been in compliance with the original project’s planting plan and applicable maintenance agreements.
2. The replanting will be designed to bring the stocking to an adequate level as determined by the IDNR/BOF.
3. “Forestry Technical Guide - Tree Planting “specifications apply to this plantation replanting practice.

SITE PREPARATION FOR NATURAL REGENERATION

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DEFINITION:

Site preparation is the mechanical and/or chemical work required to create conditions favorable for the natural regeneration of desirable tree species.

PURPOSE:

Site preparation practices are designed to establish a stand of trees for timber production and/or wildlife habitat enhancement.

MANAGEMENT PLAN:

A written management plan approved by the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) is required for all projects of state and federal programs for which IDNR/BOF has technical responsibility. Compliance with the plan is required for project approval.

SPECIFICATIONS:

1. Mechanical and/or chemical treatments will create site conditions favorable for the regeneration of desirable species through seeding, sprouting or a combination thereof. Treatments can include vegetation control and/or forest floor scarification.
2. The minimum stocking of desirable species during the five year establishment period is 300 seedlings and/or sprouts per acre.
3. Adequacy of stocking after the five year establishment period is determined by IDNR/BOF on individual stand basis.
4. Chemicals used in performing this practice must be applied according to authorized use, label directions, and other federal or state policies and requirements.
5. The area treated must be protected from domestic livestock grazing and fire.

FOREST STAND IMPROVEMENT

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DEFINITION:

Forest stand improvement (FSI) is the silvicultural forest management accomplished prior to stand maturity.

PURPOSE:

FSI practices are designed to improve species composition, quality, survival, growth rates, forest health, and wildlife habitat. FSI practices include thinning, release from woody competition, control of vine competition, pruning, and protection from damaging agents.

MANAGEMENT PLAN:

A written timber management plan approved by the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) is required for all projects of state and federal programs for which the IDNR/BOF has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Stand thinning for crop tree release will be in accordance with the USDA Forest Service publication NA-TP-19-93 "Crop Tree Management in Eastern Hardwoods". Modifications may be made for local conditions and wildlife habitat enhancement
2. Practices may be accomplished by chemical and/or mechanical methods.
3. Chemicals used in performing this practice must be applied according to authorized use, label directions, and other federal or state policies and requirements.
4. The treated area must be protected from domestic livestock grazing and fire.

FENCING TO EXCLUDE LIVESTOCK

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

Construction of permanent fencing to exclude domestic livestock from an existing forest, natural forest regeneration or tree plantation.

PURPOSE:

To protect a forest, natural regeneration or tree plantation from destructive domestic livestock. In addition to protection of vegetation, erosion and water quality degradation caused by grazing of fragile sites will be eliminated.

MANAGEMENT PLAN:

A written management plan approved by the District Forester is required for all projects of state or federal cost share programs for which the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Minimum fencing standards:
 - a. For barb wire, four strands of 12-1/2 gage with line post at no more than one rod (16.5 feet) intervals.
 - b. High tensile and woven wire fence specifications are determined by IDNR/BOF on an individual project basis.
 - c. Corner and brace post shall be of adequate size and spacing to support fence.
 - d. The following tree species may be used for line, corner and brace posts: Bur and White oak, Red Cedar Osage Orange (hedge), and Black Locust. All other wooden post must have been commercially treated as per state and federal regulations and have twenty year durability.
 - e. Wire shall not be attached to trees.

- f. Wire gates shall be of materials of the same kind, grade and size specified for the field fence. Commercial panel gates are acceptable.
 - g. Used materials may be acceptable if adequate condition to exclude livestock for a minimum of 20 years. The IDNR/BOF determines acceptability of used materials.
2. The landowner is responsible for fence maintenance and protection of the area from domestic livestock for the duration of the practice.
 3. Property line fencing may be required but will not be eligible for cost share assistance.

TEMPORARY ELECTRIC FENCING FOR DEER DAMAGE CONTROL

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

A multifilament flat conductive ribbon used as an electric fence to control deer damage in a tree plantation.

PURPOSE:

To temporarily control deer browse damage so the trees can achieve a general height above that of the severe browse level.

MANAGEMENT PLAN:

A written management plan approved by the District Forester is required for all projects of state or federal cost share programs for which the Iowa Department of Natural Resources Bureau of Forestry Division (IDNR/BOF) has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATION:

1. Eligible plantations:
 - a. Established for the purpose of long term production of forest products, wildlife habitat, site protection and/or water quality enhancement. Production of intermediate products from these plantations is permissible only if consistent with the IDNR/BOF "Forestry Technical Guide - Tree Planting" paragraph 6.
 - b. Deer browse damage will likely cause tree mortality with resulting plantation stocking level of "inadequate" (IDNR/BOF Forestry Technical Guide - Tree Planting, paragraphs 13) as determined by IDNR/BOF.

2. Minimum fencing standards:
 - a. A flat conductive ribbon at least 5/8 inch wide with stainless steel standards (aluminum not acceptable). Minimum strand diameter is 0.02 inches for 4 Strand ribbon, 0.015 inches for 6 or more strands. Expected useful life of material is at least two years.
 - b. Minimum energizer output is 0.5 Joule/0.25 mile of fence.
 - c. Ribbon height is 30-36 inches on posts at no more than 33 ft. intervals with high density polyethylene.
3. The treatment area must be protected from domestic livestock grazing and fire.

ALTERNATE COVER FOR COMPETITION CONTROL IN PLANTATIONS

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

Conversion of existing ground cover to vegetation less competitive with a tree plantation.

PURPOSE:

To improve the survival and growth rate of a plantation that is being severely affected by competition with existing ground cover.

MANAGEMENT PLAN:

A written management plan approved by the District Forester is required for all projects of state or federal cost share programs for which the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Mechanical and/or chemical treatments may be used to create a seedbed.
2. Chemicals used in performing this practice must be applied according to authorized use, label directions and other federal or state policies and requirements.
3. The seeding will consist of non sod forming grasses and/or forbs.
4. The area must be protected from domestic livestock grazing and fire.

RODENT CONTROL IN PLANTATIONS

FORESTRY TECHNICAL GUIDE IOWA DEPARTMENT OF NATURAL RESOURCES

DEFINITION:

Control of a rodent population whose damage is threatening the survival of a tree plantation.

PURPOSE:

To improve the survival a plantation that is being severely affected by rodent damage. The control is designed to enable the trees to grow beyond the size susceptible to serve rodent damage.

MANAGEMENT PLAN:

A written management plan approved by the District Forester is required for all projects of state or federal cost share programs for which the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) has technical responsibility. Compliance with this plan is required for project approval.

SPECIFICATIONS:

1. Mechanical and/or chemical treatment may used to control rodent population.
2. Chemicals used in performing this practice must be applied according to authorized use, label directions and other federal or state policies and requirements.
3. The area must be protected from domestic livestock grazing and fire.

WOODLAND STEWARDSHIP PLAN

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DEFINITION:

A Woodland Stewardship Plan identifies and describes actions to protect, manage, maintain, and enhance relevant resources in a manner compatible with landowner objectives.

PURPOSE:

Woodland Stewardship Plans are designed to promote long-term sustainability of forests and forest resources by balancing the public's need for forest products with the need for protecting and enhancing watershed productivity, air and water quality, fish and wildlife habitat, and threatened and endangered species.

WOODLAND STEWARDSHIP PLAN:

A Woodland Stewardship Plan written or approved by the Iowa Department of Natural Resources Bureau of Forestry (IDNR/BOF) is required for all Forest Land Enhancement projects.

SPECIFICATIONS:

Although the specific format of a Woodland Stewardship Plan may vary it **must** contain the following information:

1. Plan Identification – The following components must be included:
 - a. Landowner name, address, and phone number
 - b. Plan preparer name, address, phone number and signature
 - c. Date of Plan
 - d. Legal Description
 - e. Stewardship acreage
 - f. Landowner goals and objectives (stated in terms that are easily measured).
 - g. General property description with supporting objectives
 - h. Map(s) depicting property boundaries, cover types, water, roads, etc. that are clearly labeled
 - i. List of known threatened and endangered species
2. Management Objectives – List the landowner's stewardship objectives. Objectives should be succinctly expressed and easily quantified.
3. Property Wide Resource Information – A general property overview, including pertinent information on access, past and current uses, or significant

features. **This section will address cover types, topography, soils, wildlife and fish, water quality, recreation, and cultural resources found on the property.**

4. Management Recommendations & Prescriptions (including timeline).
5. Appendices – Use appendices to support recommended practices, to better inform landowners, and to consolidate the various aspects of the Forest Stewardship Plan.