



## GROWING WOODY PLANTS FROM SEED

### FOREST STEWARDSHIP MANAGEMENT NOTE #11

#### INTRODUCTION

Most of the tree planting in Michigan is done with seedlings raised in nurseries (FSMN #12) because it has generally been the least expensive and most reliable method. However, growing trees from seeds planted directly in permanent field locations is becoming popular in some parts of the country, and there are some situations where direct seeding is an appropriate practice in Michigan.

This Note gives general guidelines for direct seeding and summarizes recommendations for some specific types of projects.

#### GENERAL GUIDELINES FOR DIRECT SEEDING

1. **SPECIES SELECTION** - As with planting seedlings, direct seeding projects should begin with an assessment of the soil type(s) present in the proposed planting area. Consult the woodland management table in your county Soil Survey for a list of species to plant or ask your nearest Soil Conservation Service office about tree planting information for your soils (FSMN #4).
2. **OBTAINING AND STORING SEEDS** - Where possible, use local seed of native species from natural stands located within 50 miles of the planting location. Try to obtain seed produced in years of heavy seed crops; viability of seeds produced in years of light seed production tends to be low.  
  
Germination rates vary among species, but are seldom greater than 80%, and 40% is good for some species. Seeds of most species lose viability rapidly when stored dry, and some species require "stratification" (storage in cold, moist sand for a specified period) before they will readily germinate. Consult the References for additional recommendations about collecting and storing seeds of individual species (#4,6,9,12).
3. **SITE PREPARATION** - Site preparation for direct seeded woody plants is even more important than for seedlings as competing plants have an even greater size and time edge. Site preparation methods for direct seeding are like those for seedlings (FSMN #10).
4. **PLANTING SEEDS** - Seeding should be done in spring as early as conditions permit or in fall after October 15. Unless rodents are known to be at very low levels, seeds should be treated with rodent repellent. Bird repellent may also be necessary. The actual seeding process can be by done broadcasting, spotting, or drilling.

**BROADCAST SEEDING** may be done aerially, by hand, or with a cyclone seeder. Cyclone seeder are available in manual models and in motorized versions that may be attached to site preparation equipment or other vehicles. Bands of seed should be spaced about 15 feet apart. Seeding rates are specified as ounces of seed per acre (#6).

**SPOT SEEDING** is generally done with handtools. Spots consist of areas about 1-4 feet across that have been prepared with chemical or mechanical weed control methods. Spots are spaced at the same spacing used for planting seedlings (FSMN #8) or closer, to allow for failures. Seeding rates are specified as the number of seeds per spot (#6).

**DRILL SEEDING** is done with modified farm equipment.

5. MAINTENANCE - Maintenance of direct-seeded plantings consists of mechanical or chemical weed control, thinning of over-crowded seedlings, and replanting of failed spots (FSMN #14).

## CONSIDERATIONS FOR SPECIFIC PURPOSES

1. BLACK WALNUT - In Michigan, black walnut is native only to the southern part of the Lower Peninsula. Although, cold-hardy varieties are commercially available, northern growers should consider plantings as experimental. Soil should be deep (greater than 3 feet), well-drained, and have good moisture holding capacity, such as fertile loams, sandy loams, and silt loams with high organic matter (#1,15).

Black walnut trees can be readily grown from seed that you collect. Collect the nuts in fall and plant them with the green husks still on, or husk them and store over winter in cool, moist conditions for planting in spring (#15). Husked seeds that float in water are probably not good and should be discarded. You may also buy stratified seed (ready to germinate) from nurseries, including seed selected for lumber or nut production.

By collecting your own seed, you can select for geographic range and for desirable tree characteristics. Seeds gathered from an area 100-150 miles south of the planting site are likely to survive well and grow more rapidly than locally grown seed (#8). For lumber production, select parent trees that have straight trunks, small horizontal side branches, no major forks, and few other defects. It is wise to collect seed from many trees rather than just a few.

Because planting gathered seed is inexpensive, you can overplant and thin to the best trees as their characteristics become apparent. Some seeds may take 2-3 years to germinate, especially if the soil is dry. Plant rows 12-20 feet apart with seeds about 1 foot apart within the rows and 2-3 inches deep. After 4-5 growing seasons, select the best tree in each 10-15 foot segment and thin out the rest (#8). Alternatively, several seeds can be planted in prepared spots 3-4 feet in diameter laid out on a 10 x 10 foot square grid (#15). A third alternative, called intercropping, is to widely space walnuts and plant other crops between them (#1,7,11).

Weed control is important before and after planting, but herbicides may damage seedlings less than one year old (#8,11). The main disadvantage of growing walnuts from seed is loss of seed to squirrels and other rodents. Repellents and mechanical barriers can be used to deter rodent pilferage (#14).

2. NORTHERN HARDWOODS - At present, direct seeding of northern hardwoods in the Lake States is used primarily to augment poor natural seeding or to increase the proportion of preferred species (#2). Sites should be prepared by shallowly mixing the soil. An overstory of 70-80% crown cover should be left until the seedlings are 2-4 feet high. Special recommendations apply for individual species (#2).
3. OAKS - Many woodlands can be greatly improved by the addition of a few oaks and, fortunately, oaks are among the most suitable species to plant by direct seeding. Acorns can be readily gathered, and their large size gives them a better chance of survival than most other tree seeds. Acorns from trees in the red oak group (red, black, etc.) will remain viable in cold storage for 3 years or more, but acorns of the white oak group (white, swamp chestnut, etc.) should be planted within a few months (#4).

Acorns grow best when planted 2-3 inches deep but planting 4-6 inches deep may pay off where rodent problems or dry soil exist. Planting can be accomplished by making a hole with a rod, dropping the acorn in, and closing the hole with your foot. You can also make special planting tools to make the job easier (#4). In open fields, some types of planting machines, such as those used for soybeans, can often be modified to plant acorns. Oaks need good sunlight to prosper, so if they are to be planted in an existing woodland, they should be located in the largest openings available.

## REFERENCES

FSMN #'s refer to other Forest Stewardship Management Notes in this series.

- #1 Beineke, W.F. 1987. Black walnut plantation management. Purdue University Extension Publication FNR 119.
- #2 Godman, R.M. and G.A. Mattson. Undated. Direct seeding. Northern Hardwood Notes 3.08. USDA Forest Service, North Central Forest Experiment Station.
- #3 Hooper, C.A. and T.W. Curtin. 1983. Growing Illinois trees from seed. University of Illinois Cooperative Extension Service Circular 1219.
- #4 Illinois Forest Stewardship Program. 199\_. Direct seeding hardwoods. Chapter 1, Pages 43-44 in A landowner's guide to woodland stewardship.
- #5 King, J.P. and D.H. Dawson. 1971. Selecting seed sources of forest trees for the Lake states. USDA Forest Service Research Note NC-108.
- #6 Michigan Department of Natural Resources, Forest Management Division. 1992. Stewardship Incentive Program (SIP) practice standards and specifications manual.
- #7 Michigan Department of Natural Resources. 1989. Intercropping black walnut plantations. Forest Management Bulletin No. 8-4.
- #8 Michigan Department of Natural Resources, Forest Management Division. 1986. Planting walnut seed. Forestry Information Bulletin No. 1-2.
- #9 Miles, W.R. and J.H. Smith. 1970. Growing trees from seed. University of Minnesota Agricultural Extension Folder 249.
- #10 North Central Forest Experiment Station. 1988. Walnut notes. USDA Forest Service.
- #11 Schlesinger, R.C. and D.T. Funk. 1977. Manager's handbook for black walnut. USDA Forest Service GTR-NC-38.
- #12 Schopmeyer, C.S. (ed.). 1989. Seeds of woody plants in the United States. USDA Forest Service Agricultural Handbook No. 450. U.S. Government Printing Office.
- #13 U.S. Department of Agriculture. Date unknown. Seed and planting stock dealers. U.S. Government Printing Office.
- #14 Van Damme, L.W., et al. 1992. Microsite soil compaction enhances establishment of direct-seeded jack pine in northwestern Ontario. Northern Journal of Applied Forestry 9(3):107-112.
- #15 Van Sambeek, J.W. and A. Taylor. 1985. How to start walnut trees from seed. USDA Forest Service North Central Forest Experiment Station.

**CITATION:** Burnett, Christopher D. 1994. Growing woody plants from seed. Michigan Forest Stewardship Management Note #11. Michigan Department of Natural Resources, Forest Management Division.

**ACKNOWLEDGEMENTS:** This project was supported, in part, by a grant from the Michigan Department of Natural Resources and the USDA Forest Service.