



CENTRAL HARDWOOD NOTES

Wild Grapevine Management

Wild grapevines are a problem for forest managers in many areas of the central hardwood forests. The vines grow on a wide range of soil and site conditions but usually are more concentrated on good sites (northern red oak site index 70 and above), on the faster growing more valuable timber. Presently there is more interest and concern in controlling grapevine for the cove hardwood type than the oak-hickory, oak-pine, or bottomland hardwood types.

Grapevines are a problem because they damage trees by breaking tops and limbs, and twisting, bending, and often breaking tree boles. Merchantable volume is lost, and tree growth and quality are reduced. They can also cause trees to be uprooted and killed. On the other hand, grapevines produce food and cover for many species of wildlife, so measures to control grapevines may conflict with wildlife and recreational goals.

Once grapevines get in a tree crown or bole, the vines begin to dominate the tree. When this occurs, the potential use of that tree for future timber products is low. An overabundance of grapevines can also conflict with wildlife management goals for maintaining mast-producing trees. So even where wildlife is the primary concern, vine control is important for mast management in some stands.

Wild grapevines need light to grow well. Vines are prolific stump sprouters and they root easily. Male and female flowers are usually on separate plants, and periodically they produce large quantities of seed which remains viable in the soil for at least 15 years.

Grapevines can be a more serious problem when the stand is cut heavily, as in clearcutting and other even-age type practices. They are less serious under partial cuts such as single-tree selection or thinnings. After heavy cuts in areas where grapevines are present, newly germinated grape seedlings can easily exceed 100,000 per acre.

Recommendations to
Control Growth

The keys to controlling grapevines are in canopy shading or herbicides.

Even-age management-In sapling, poletimber, and immature sawtimber stands, you can control vines by cutting near groundline using tools such as blades, loppers, hatchets, and chain saws. The cut vine stumps will sprout but the sprouts will die within 3 to 4 years from shade. Do not cut grapevines in sapling stands until the crown canopy provides shade, about 8 to 10 years after cutting when you

can easily walk under the canopy. If a precommercial crop tree release or thinning is planned and grapevines need control, treat the vines first. Wait at least 5 years before doing the release or thinning.

Use herbicides to control grapevines only when mature stands are ready to harvest. If you schedule some even-age practice in a grapevine problem area within the next 4 to 5 years, spray vines at their base with an herbicide-oil mixture. Spray the stems of vines attached to trees and the "layered" vines (ones sprouting roots) at groundline. Vines can be basal sprayed with an herbicide-oil mixture throughout most of the year. Even if you herbicide before harvest, grape seedlings will germinate prolifically in the new stand and you will have to control vines when it becomes sapling size.

If the mature stand has a major grapevine problem and is not going to be harvested during the next 5 years using an even-age cutting practice, no herbicides are necessary. Cut the grapevines near groundline. These stumps will sprout, but the dense canopy shade will cause the sprouts to die in 3 to 4 years. Again, you will have to control grapevines in the new sapling stand.

Uneven-age management.-Normally, partial cuts such as single-tree selection, improvement cuts, and some diameter-limit cuts result in residual stands with understory shading. Grapevines can be controlled in mature stands by severing vines that grow in tree crowns before, during, or after logging. The vine stumps will sprout, but will die within a few years. Barring any drastic overstory removal or natural disaster, the vines will not become a major problem for future timber production.

Costs

The costs of cutting vines depend on size and number of vines per acre. In mature stands, it takes one person about 2.2 hours to cut 100 grapevines per acre. And for *sapling* stands it takes about 1.2 hours to cut 100 grapevines per acre. To basal spray 100 grapevines per acre in mature stands, it takes a person about an hour and about 1 gallon of herbicide-oil mixture. You don't need herbicides in immature stands unless a clearcutting-type practice is planned.

When are Grapevines a Problem?

How many vines per acre should you tolerate? It depends on what percentage of the stand is dominated by grapevines, and, of course, on management objectives. On high-value hardwood sites you may want to eliminate all grapevines. For wildlife management on the other hand, 1,000 grapevines per acre may be desirable. Where "arbors" are present (vines overtopping vegetation, creating an opening in the stand canopy), few additional grapevines are needed in the remaining stand for wildlife food. For timber production, 50 grapevines per acre (6 percent of the trees in the stand have grapevines in their crowns) are usually tolerable.

To determine what percent of the trees in your stand have grapevines, count the rooted grapevines on several sample plots, convert to a per-acre basis, and then go to the left-hand column in table 1. For example, 100 rooted grapevines per acre correspond to 190 trees with grapevines in their crowns. Table 1 does not estimate grapevines in arbors. It is not economically feasible to control arbors.

Table 1 --Estimate of grapevines in tree crowns, sapling stands

Rooted grapevines per acre (Number)	Trees with grapevines	
	Number/acre	Percent of stand ¹
25	80	4
50	115	6
100	190	10
200	335	18
400	625	33
600	910	48
800	1,200	63
1,000	1,490	78

¹ Stands averaged 1,900 trees/acre 1.0 inch in d.b.h. and larger.

Summary

Grapevine management must be consistent with forest management objectives. Controlling the growth and development of wild grapevines is not difficult in most situations. If your objective is to grow only high quality timber, you may try to eliminate all grapevines (excluding arbors). If wildlife management is your objective, you may want to create openings to stimulate reproduction and growth of grapevines by felling small groups of trees that have vines in their crowns. However, in most cases, you will probably want to grow quality timber as well as encourage wildlife development. This means that although there are some grapevines, the stand is not dominated by them. Allowing grapevines to develop in arbors and applying grapevine control in the remaining stand is a feasible compromise. It provides wildlife food and cover while simultaneously allowing the remaining stand to be managed for quality hardwood timber, mast-producing trees, and other resources as well.

References

- Smith, H. Clay. 1984. Forest management guidelines for controlling wild grapevines. Res. Pap. NE-548. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 15 p.
- Smith, H. Clay; Lamson, Neil I. 1986. Wild grapevines-a special problem in immature Appalachian hardwood stands. In: Smith, H. Clay; Eye, Maxine C., eds. Proceedings, Guidelines for managing immature Appalachian hardwood stands; 1986 May 28-30; Morgantown, WV. SAF Publ. 86-02. Morgantown, WV: West Virginia University Books: 228-239.
- Trimble, G.R., Jr.; Tryon, E.H. 1979. Silvicultural control of wild grapevines. Bull. 667. Morgantown, WV: West Virginia University, Agricultural Forest Experiment Station. 19 p.

H. Clay Smith
Northeastern Forest Experiment Station
USDA Forest Service
Parsons, West Virginia