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The Introduction, Spread, and Control of Non-Native, Invasive Species in Tennessee Forests: Kudzu

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KUDZU *(PUERARIA MONTANA)*

Kudzu is a perennial, leguminous vine that was introduced to the United States from eastern Asia for use as an ornamental, forage for livestock and for erosion control. The vine is invasive, grows rapidly, and is frequently found on trees, shrubs, utility poles, fences, and buildings. Kudzu can damage or kill most of the vegetation where it resides. The plant is difficult to control, spreading from seed, vines, and root sprouts. The large tuberous root system, which is much like a potato with large starch reserves, fuels the growth of the vines.

Kudzu climbing on a road sign.
Photo Credit: Wayne Clatterbuck

Vines grow from buds on a root crown at the soil surface. As the vines spread, rooting occurs from buds at each node on the vine. With vine growth of up to 50 feet per growing season, a single plant can spread to cover large areas each year. Roots developing from the vine nodes usually enlarge into root crowns from which additional vines will arise. Mature stands of kudzu may have root crowns every 1 to 2 square feet.

Although some literature refers to kudzu as a climbing vine, the vine is not actually able to climb on its own accord. Kudzu is a semi-woody vine that cannot support its own weight and it does not have tendrils for climbing such as English ivy or grape vine. Kudzu vines grow into tree crowns by wrapping around successively growing small limbs or on smaller vegetation underneath tree crowns and then reaching 3 to 5 feet above for another source of support. Without tendrils and woody support, kudzu is not able to wrap itself around large diameter stems. Thus, the vine grows into tree crowns by wrapping around small, successive limbs or wrapping around smaller adjacent vegetation and reaching into tree crowns.

Most of the kudzu present in Tennessee is spread from runner vines of established plants. Although the seed is a hard-coated legume that remains viable for several years and can colonize uninhabited areas, most of the kudzu spread is by vines and the resulting root crowns. Many kudzu infestations originate from old, well-established rootstocks at field edges. Annual cultivation once kept vines from spreading into adjacent areas.

Kudzu was originally planted for erosion control, but it was not particularly effective. The tuberous root system is not exceptionally fibrous. Soil will continue to erode by overland flow underneath the mat of vines during summer and winter. The mat of vines and deciduous leaves will hinder raindrop erosion during the summer.

Roots (tubers) of established crowns can reach several inches in diameter and may grow to depths of three feet. The tubers do not sprout, but the high starch content of the roots supports early spring growth and vigorous regrowth if vines are damaged by mowing or grazing.

Kudzu displacing resident vegetation.
Photo Credit: Wayne Clatterbuck

The starch-rich roots make control difficult because this stored root reserve supports regrowth. Considering the new root growth from expanding nodes and the fleshy tubers, several years of repeated treatments are necessary to deplete the root reserves and to completely control kudzu. The above-ground vines are usually top-killed the first year. Resprouting vines and root crowns should be treated in successive years for eventual control.

With a large tuberous root system and aggressive growth habit, control of kudzu requires persistent treatment. Several strategies can be employed to control kudzu: herbicides, prescribed burning, mowing and livestock grazing. When selecting a control strategy, consider constraints that may prevent broadcast or cut vine treatments of herbicides, use of tractors to spray or mow, proper burning procedures and times, and presence of desirable vegetation. Thick mats of kudzu can hide ditches, gullies, logs, wells, and other hazards. Be careful and plan accordingly!

Mowing --- Repeated mowing can weaken and ultimately control kudzu. Mowing is a good first step toward control, provided it can be done without risk to the operator and equipment. Close mowing reduces the above-ground biomass and makes treatment of regrowth much easier. Without adequate photosynthetic area to support the root system, the roots begin to decline with time. Thick mats of vines are often difficult to mow with light, rotary mowers. Flail mowers with horizontal blades cutting in a chopping motion sever vines close to the ground more effectively.

Burning --- Prescribed fire does not control kudzu, but it can be used to consume vines and leaves to permit inspection of the site and to determine the size and density of the kudzu root crowns. Burning should be done in late winter and early spring to limit the exposure of bare soil to winter rains, thus minimizing soil erosion on steeper areas. Prescribed burning promotes kudzu seed germination. Burning is usually conducted in conjunction with other control treatments. Repeated or annual burns are difficult to sustain because of the lack of fuel to carry the fire.

Grazing --- Kudzu can be used as a forage for cattle, goats, and other livestock. Other sufficient grazing areas are needed to rotate livestock as the kudzu is grazed down. Only by repeated grazing of the regrowth over successive growing seasons will the root reserves of starch be depleted.

Herbicides --- Several herbicides are labeled for kudzu control. Their use requires careful site evaluation and prescription according to the information contained on the herbicide label. Herbicides can be used in combination with other treatments, such as prescribed fire, mowing, or grazing which reduce the amount of vegetation and allow easier application of the herbicide to the weakened plants. A few herbicides for kudzu control are glyphosate, trichlopyr, clopyralid, aminopyralid, and metsulfuron. Follow label instructions. These herbicides are foliar sprayed with a nonionic surfactant to encourage wetting and penetration.

Kudzu control programs require commitment to annual follow-up treatments for at least three growing seasons. The older the kudzu, the more difficult the control and the more follow-up treatments required to deplete the starch reserves of the root system.

FURTHER REFERENCE WEB-LINKS

For Residential Areas from Alabama Cooperative Extension System
https://www.aces.edu/blog/topics/forestry-wildlife/kudzu-control-in-residential-areas/

For Forests from Alabama Cooperative Extension System
https://www.aces.edu/blog/topics/forestry-wildlife/kudzu-control-in-forests-rights-of-way-natural-areas/

From Mississippi State Extension
http://extension.msstate.edu/sites/default/files/publications/publications/p3187.pdf

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