

Kudzu [*Pueraria montana* (Lour.) Merr.]

John D. Byrd, Ph.D., Extension/Research Professor, Mississippi State University

Victor Maddox, Ph.D., Research Associate, Mississippi State University

Randy Westbrooks, Ph.D., Invasive Species Specialist, U.S. Geological Survey



Fig. 1. Kudzu grows violet flowers in September through January.

Fig. 2. Kudzu twines over everything in its path on this rural road in Mississippi.

Fig. 3. Kudzu leaves are alternate and tri-foliolately compound with leaflets 2-8 inches long.

Introduction

Problems Caused

Kudzu [*Pueraria montana* (Lour.) Merr.], also known as Japanese arrowroot or vine-that-ate-the-South, is a perennial, high-climbing vine native to eastern India, China and Japan. It was introduced into the United States in 1876 at the Centennial Exposition in Philadelphia and recognized as forage in 1905. By 1946, an estimated 300,000 acres were planted. In addition to its use as forage, kudzu was also widely planted for soil stabilization in the South. It has been used some as an ornamental and for certain edible and medicinal uses.

Regulations

It is a Noxious Weed in FL, IL, KS, KY, MS, MO, PA, TX, and WV. It is Banned in CT and Prohibited in MA. Kudzu is a Quarantine and "A" Designated Weed in OR and WA. It can be problematic in all MidSouth states in almost all habitats except aquatic. Kudzu can host Asian soybean rust, a potentially serious pathogen in soybeans [*Glycine max* (L.) Merr.].

Description

Vegetative Growth

The Genus *Pueraria* belongs to the Pea (Fabaceae or Leguminosae) Family. Of the 17 *Pueraria* species, native to the tropics and East Asia, only two grow in the United States, *P. phaseoloides* (Roxb.) Benth. and *P. montana*. Of the two varieties, only *P. montana* var. *lobata* (Willd.) Maesen & S. Almeida (kudzu) is a problem in the continental United States. Kudzu is a perennial, woody, trailing to high-climbing, twining vine reaching around 80 feet. Trailing stems may root when in contact with the soil and produce large tuberous roots, which have been eaten in Asian countries. Twining generally occurs on objects less than 4 inches. Stems are covered with stiff, rust-colored or golden hairs when young, maturing brown, woody, and smooth to 10 inches in diameter. Leaves are alternate and tri-foliolately compound (Figure 3) with leaflets covered with golden hairs and typically lobed. Large leaves have leaflets 2-8 inches long. Petioles are 6-12 inches long with a swollen base and deciduous, ovate-lanceolate stipules.

Flowering

Kudzu flowers September-January. The racemes or panicles are axillary, 2 to 12 inches long, and open from bottom to top. Flowers are about 1 inch in diameter and occur in pairs or threes in a spiral pattern up the main axis. Lower petals are lavender or violet-purple and the upper petal similar in color or pinkish with a yellow patch near the base. Flowers are fragrant and attract pollinators. Clustered fruit are produced from September to January. They are flattened legumes—1.2 to 3 inches long, 0.3 to 0.5 inches wide, and covered with stiff golden-brown hairs. Seeds are ovoid to nearly square and around 0.1 inch in diameter. Seed viability is variable.

Dispersal

Kudzu is dispersed by wind, animals, human activity, and water. Vegetative spread by rooting stems and movement of vegetative parts (stem segments or tubers) in soil is also common.

Spread By

Kudzu continues to spread by seed which are wind-, animal-, and water-dispersed and rooting stems. Both seeds and stem segments can be transported in soil to new sites.

Habitat

Kudzu is problematic in all habitats, except aquatic, forming dense thickets quickly shading out trees and vegetation. It is relatively drought tolerant and will grow in a wide range of soils. Once established, kudzu is difficult to eradicate.

Distribution

Kudzu is native from Japan to China and eastern India. It has escaped in South Africa, Malaysia, western Pacific Islands, and the United States. In the United States, it occurs from Maine to Florida west to Nebraska and Texas. Kudzu has also escaped in Washington and Oregon. Kudzu is widespread throughout the MidSouth, particularly on slopes.

Control Methods

Biological

No widespread biological controls are used in the U.S. Research is ongoing.

Chemical

There are herbicide treatments of kudzu. All should be applied at low volumes in the fall.

Mechanical

MS Agricultural Experiment Station Bulletins 326, published 1939, states kudzu can be easily

Herbicide	Active Ingredient	Rate per Acre	Comments
Escort	Metsulfuronmethyl	4 oz.	Can be applied overtop of established pine trees or as a ground application under hardwoods.
Milestone VM	Aminopyralid	7 oz.	Will damage trees and many broadleaf plants, but safe on grasses.
Milestone VM Plus	Aminopyralid + Triclopyr	64-96 oz.	Will damage trees and many broadleaf plants, but safe on grasses.
Roundup	Glyphosate	128 oz.	Will injure most grassy and broadleaf vegetation.
Tordon K	Picloram	64 oz.	Will damage trees and many broadleaf plants, but safe on grasses.
Transline	Clopyralid	21 oz.	May be applied overtop of pines as well as certain hardwood species and grasses.

controlled with "grazing or frequent and thorough plowing." Bulletin 438, published 1946, stated that kudzu could be controlled with one or two years of continuous heavy grazing or one year of plowing followed by planting and cultivating a row crop. This publication went on to state that frequent mowing for hay, like continuous grazing, would cause the loss of an established stand of kudzu. So, some mechanical methods of kudzu control may be used in areas that can be either grazed, mowed, or tilled. Mechanical controls, including hand removal, can be successful for small infestations. Multiple approaches may be more feasible for larger populations. Removing plants prior to fruit ripening to avoid seed dispersal is suggested. Because stems can propagate through fragmentation, be careful to remove all stems.

Physical

Since kudzu grows in a wide range of conditions, cultural methods are generally not utilized. While converting an area to regular tillage may eventually remove kudzu from a site, it can also drastically change the species composition on the site and should be considered carefully. Since kudzu is a broadleaf vine, a pine-dominated forest community might be another cultural method for consideration.

References

Langeland, K.A., and K. Craddock Burks. 1998. Identification and biology of non-native plants in Florida's natural areas. University of Florida, Gainesville, FL 32611.

Miller, James H. 2003. Nonnative invasive plants of southern forests: A field guide for identification and control. Southern Research Station, Asheville, NC.

USDA, 1948. Grass: The yearbook of agriculture 1948. United States Government Printing Office, Washington D.C.

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 6 August 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

John D. Madsen, Ph.D.

Mississippi State University, Geosystems Research Institute

Box 9652, Mississippi State, MS 39762-9652

Ph. (662)325-2428, jmadsen@gri.msstate.edu

www.gri.msstate.edu

