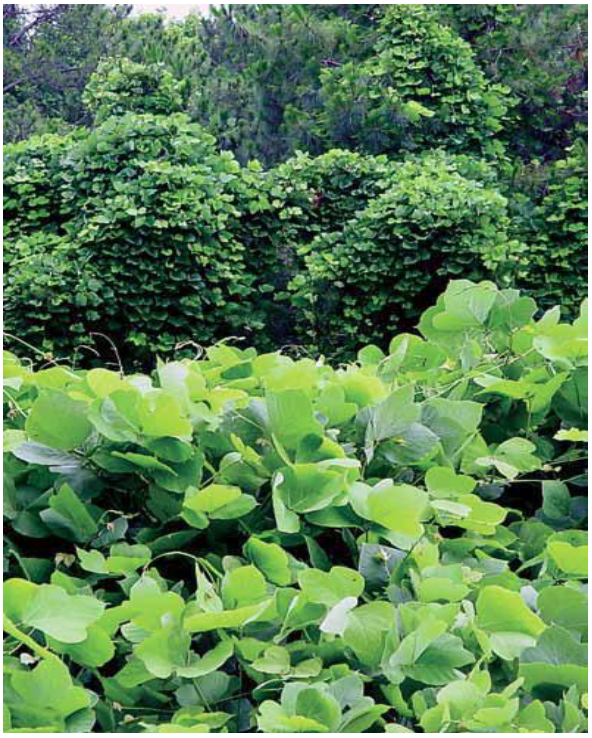
Kudzu



Kudzu (Pueraria montana) is a climbing, semi-woody, perennial vine of the legume family. Originally imported from Japan and China in the early 1900s, kudzu was utilized for ornamental purposes and as a forage crop for livestock in the southern United States. During the Great Depression, kudzu was heavily promoted for erosion control. In Missouri, kudzu was planted along highways to control erosion and as forage prior to 1970. Today it can be found in isolated populations within select counties primarily along highways.

Kudzu grows well under a wide range of conditions and in most soil types, except for saturated soils. Preferred habitats are forest edges, abandoned fields, roadsides and disturbed areas, where sunlight is abundant. Kudzu grows best where winters are mild and summers are hot. Harsh winters can kill young stems, but root crowns will re-sprout.

Kudzu stems are yellow-green with dense, erect, golden hairs and matted, silver hairs. As stems mature, they become ropelike, light gray to brown and hairless. Mature vines develop massive taproots able to penetrate up to 12 feet in depth. Leaves are alternate, with three broad leaflets up to 9 inches in length. Leaflets may be entirely or deeply two- or three-lobed with hairy margins. Fragrant purple flowers form in clusters from June to September. Only vines in full sun will flower. Flattened, hairy legume pods contain three to 10 oval seeds, few of which are viable.

Kudzu reproduces primarily by vegetative means. Numerous individual vines trail and climb from a single large, ball-like central root crown. Vines in contact with the soil will root at the nodes to form a new root crown and new stems. New vines also sprout from rhizomes.

Impacts

Once established, kudzu plants grow prolifically, with a single root crown containing up to 30 vines. Kudzu rampantly spreads to form dense mats over the ground, shrubs, mature trees and buildings, reaching more than 60 feet high. Kudzu kills or degrades other plants by smothering them under a solid blanket of leaves that allow little light to penetrate. It can girdle shrubs and trees, break branches and uproot entire trees under its weight.

Control

Typical mechanical treatments are not likely to be successful on kudzu. Therefore, few options remain except herbicide applications. Although herbicide applications can be conducted any time the vine is actively growing, foliar applications of clopyralid in the late summer or early fall when nutrients are being transported to the root system are one of the most effective treatments. In mature populations, aerial vines should be controlled first using cut-stump or basal-bark treatment methods.

Basal-bark treatment can be done for smaller vines less than 2 inches in diameter by spraying two feet of vine near ground level with triclopyr mixed with an oil or diesel fuel. For cut-stem treatments, cut individual vines at ground level and apply herbicide to the cut stem. Effective herbicides include triclopyr, picloram plus 2,4-D, or glyphosate. Both methods can be utilized during the dormant season. Re-sprouting should be controlled with clopyralid or triclopyr applications to the foliage.

Kudzu is identified by numerous trailing vines originating from a large central root crown, and by its large leaves, which are divided into three leaflets.Clusters of purple flowers produce few viable seeds.

Identifying Kudzu

! fast-growing, climbing vines hairy vines and leaves
! large-lobed leaves are alternate and trifoliate (consisting
of three leaflets) inconspicuous reddish purple flowers on climbing vines

! brown, flattened, hairy seed pod with three to 10 seeds

Native Look-alikes

Large poison ivy (Toxicodendron radicans) leaves and vining
stems look similar to kudzu, but kudzu stems and leaves are
much more conspicuously hairy. Round-leafed beggar's tick
(Desmodium rotundifolium) and hog peanut (Amphicarpaea
bracteata) might be confused with a young plant of kudzu,
but these trailing legumes do not grow longer than 5 feet
and leaflets are seldom more than 3 inches long.

As if kudzu, the invasive "vine that ate the South," weren't trouble enough, one of its little friends from Asia has joined it in the United States.
The kudzu bug, known formally as *Megacopta cribraria,* is a type of stinkbug that feeds the kudzu vine in its native Asia. While the invading vine is its favorite meal, the bug also attacks soybeans, and as it spreads from Georgia to neighboring states, there are fears it will broaden its palate and target other legume crops, including peanuts.

Kudzu was brought to the East Coast more than a century ago to control erosion. Its quick growth wreaked havoc on the ecosystem: It smothers and strangles other plants, uproots trees and breaks branches with its weight. The bug appears to have hitched a ride by accident much more recently.
Daniel Suiter, an associate professor of entomology at the University of Georgia who received initial reports of the bug in the U.S., struggles to describe its odor. It is "not an awful smell, more of a bittersweet, pungent, unpleasant odor," he said.
Scientists first learned of the tiny kudzu bug invasion on Halloween weekend in 2009, in northeast Georgia, he recounted. As temperatures cooled, the sinkbugs looking for places to spend the winter swarmed to houses.
Now that the bug is here, the spread of the fast-growing kudzu vines may decrease, but probably not signficantly, Suiter said.
"It is not like kudzu is going away, but it puts another stress on the plant, because of the number [of bugs] that get on a plant," he said. The additional stress may slow and reduce kudzu's growth, he said.

Searching for an enemy

The bug's arrival has more-worrisome implications for agriculture, however. A small soybean seedling can have 40 bugs feeding on it, according to Wayne Gardner, a professor of entomology at the University of Georgia who is looking for ways to control the new arrival's population.
In addition to soybeans, the bug has been found on green beans and wisteria, and Gardner is concerned its tastes will broaden. The

key to the bug's broad palate is a bacterium living in its guts. Known as an endosymbiont, it helps them digest their meals.

"Will the endosymbiotic bacterium adjust to other plants we have in southeast Georgia? I would be willing to bet it probably can or will evolve, so I am concerned about other legumes, one of those being peanuts," Gardner said.

As the bugs have spread into some surrounding states and have been found as high off the ground as the 30th floor of an apartment building, Gardner is investigating natural ways to control their population.

He has focused on fungi, including one called *Beauveria Bassiana* that is common to the soil in Georgia. It attacks insects by germinating through their cuticles or outer coverings.

From an entomologist's perspective, the bug's arrival brought an opportunity, Gardner said.

"This is an exotic insect that has not occurred anywhere in this continent and all of a sudden it is right here," he said. "It has been a challenge, but it has been one of those career-rewarding challenges."