Beware! Kudzu is Thriving in Indiana

The Indiana Department of Natural Resources, Division of Entomology and Plant Pathology is working on a project to eradicate kudzu. What is kudzu? Kudzu is an invasive vine that was introduced to the U.S. from Japan. In the southern U.S this vine can grow a foot per day, and can cover and out-compete native vegetation causing serious damage to the forest ecosystem. It also has the potential to harbor soybean pests and diseases. We are attempting to identify and speak with all land owners that have kudzu on their property and/or are adjacent to wooded areas infested with kudzu, so that we may develop a working relationship to ensure that this invasive species does not harm Indiana's natural resources. If you would like to report a kudzu site, please call **1-866-NOEXOTIC**, or contact the Bloomington field office at 812-332-2241 or email kcote@dnr.in.gov. Additional information can be found at the Division of Entomology and Plant Pathology web site, www.in.gov/dnr/entomolo. Thank you for your assistance and cooperation with the project. If you have any questions or concerns regarding the project, please feel free to contact the DNR.

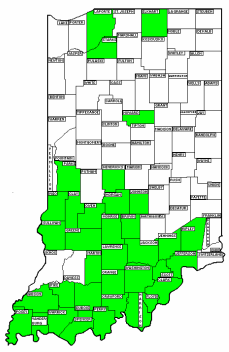
What does kudzu look like?

Leaves: Kudzu leaves look just like a bean leaf. A single trifoliate leaf is comprised of 3 smaller leaflets. The leaves and vines of young plants are often hairy. Trifoliate leaves can be as large as 10" inches across. Brown leaves often remain on the plant after the first hard freeze but eventually fall of vines by mid winter.

Flowers: Flowers are elongated and pinkish to purple. The usually appear in mid to late summer.

Seeds: Kudzu has a constricted seed pod and the shape of the individual seeds can be seen in the pod.

Kudzu Distribution



Kudzu can be confused with wild grape, wild cucumber and greenbriar. However, these plants have a simple leaf, not a compound leaf comprised of 3 leaflets. There are native Indiana plants in the bean family that can look similar to kudzu, but their leaves are usually not as large as kudzu and native plants usually do not have the aggressive growth habit that kudzu has. Kudzu vines often cover trees and all other vegetation creating a monotypic landscape.

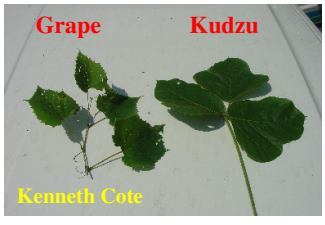
Greenbriar

Photo from www.discoverlife.org

Wild Cucumber

Photo from www.allcreatures.org

Wild Grape vs. Kudzu



History: Kudzu was introduced into the United States in 1876 at the Philadelphia Centennial Exposition. During the 1930's, kudzu was promoted by the Soil Conservation Service and planted throughout the southern United States where it was used for animal feed and erosion control. Since that time period kudzu has invaded the forested lands of the southern US covering millions of acres. In Indiana Kudzu is found primarily south of I-70, but isolated sites have been found as far north as LaPorte, Starke, and Elkhart counties. Kudzu continues to spread further north and adapt to colder climates and is now known to reproduce from seed in the state. As of 2-7-08, over 100 sites in 35 counties have been located in Indiana.

Damage: Kudzu out competes native vegetation by shading and using valuable nutrients. It also weighs down trees and increases snow load on trees causing their tops to break. In addition causing tree damage, kudzu mats can be 5 feet deep and impassible leaving many areas unusable for outdoor recreation. Kudzu mats create an ideal environment for rodents and snakes. **Finally, kudzu may act as a reservoir for soybean diseases such as soybean rust.**

Uses: In some areas of the country, kudzu vines are used for basket making and as a forage crop for animals. There are also recipes available for making kudzu dishes, including kudzu jelly. However, in most cases the benefits from kudzu do not out weight the negative effects it has on the environment.

Control Strategies:

Biological Control: Currently biological control of kudzu is not a practical option in the United States. There has been a great deal of researched conducted on biological control of kudzu and numerous fungi, bacteria, and insect biocontrol agents of kudzu are being investigated. The bacteria *Psuedomonas syringae* pv Phaseolicola has been shown to kill young kudzu seedlings. A fungus called *Synchytrium puerariae* has been found in Asia and California and is

being investigated as a potential biocontrol agent. The fungus *Myrothecium verrucaria* shows the most promise. Researchers discovered that this fungi will cause provide 95-100% control of kudzu 14 days after applications. Although this pathogen is native to the US, it will infect soybeans. Numerous insects native to China including sawflies, borers, weevils and scarabs are also being studied. However, all of the control agents studied are harmful to leguminous crops such as soybeans.

Goats as Biocontrol Agents: Goats prefer broad leaf plants over grasses and have been used to control multiflora rose and kudzu in pastures. However, the number of goats needed to provide control may be cost prohibitive and maintaining animals at a site is labor intensive. There are also additional problems such as erosion which can occur with over grazing and high amount of foot traffic from hooves animals. More research needs to be conducted on this topic, but it may provide an alternative for land owners that have animal resources available and are looking for alternative ways to control kudzu.

Mechanical: Mechanical control should be incorporated with chemical control strategies to achieve adequate kudzu suppression. Pruning kudzu away from adjacent trees is a good way to start controlling a kudzu patch.

- **Fire:** Fire alone will not control kudzu patches, but it may be used to increase accessibility prior to chemical applications. It can also be useful for stimulating kudzu seed germination before applying follow up herbicide applications. **Check your local ordinances before proceeding with this strategy.**
- **Mowing:** Repeated close mowing can slow the spread of kudzu. However it can often be difficult to get mowing equipment into rough areas. It must be performed frequently or it will merely increase kudzu propagules resulting in more kudzu plants. All equipment should be cleaned of plant debris before it is moved from the site.

- **Heavy Machinery:** In some cases, landowners have used bull dozers to remove kudzu and reclaim land. Results from this practice can be variable. Roots are very deep in older patches and may not be easily removed. If all of the roots are not removed, kudzu will quickly grow back in the area. After removal, there is usually a large amount of kudzu debris that must be disposed in a proper manner in order to prevent further spread of the plant. Movement of heavy equipment an area results in soil compaction and can lead to a change in the plant species that will be able to grow in a particular site.

Chemical: Results can vary between sites even with the same type of herbicide application. Herbicide selectivity is different for each product. Some products are highly toxic to desirable tree species unless applied in a selective manner. Product choice should consider the proximity of

water to the patch, the timing of the application, the density and age of the patch, the soil type and the type of application method that is going to be used. All of these factors will have an effect herbicide application results. Generally, the best time to perform foliar applications of herbicides to kudzu is during late summer. Plants are storing carbohydrates at this time in the growing season and are more likely to translocate herbicides to storage organs, thus providing better control. However, dormant applications of certain herbicides have been very effective with the proper application techniques.

Examples of Chemicals Labeled for Kudzu Control

- Banvel **(Dicamba)** Non-Selective
- Crossbow- **2,4 D and Triclopyr**
- Escort (**Metsulfuron methyl)**
- Garlon 3A and Garlon 4A **(Triclopyr):** Non-Selective. Safety near water varies with formulation. Dormant cut stump applications have been effective at many sites.
- Oust-**Sulfometoron methyl**
- Round-Up, Rodeo **(Glyphosate):** Non-Selective. Safer near water.
- Spike 80 DF **(Tebuthiuron)** Non-Selective
- Tordon (**Picloram and 2,4,D**) Non-Selective
- Transline **(Clopyralid)**- Specific to legumes, but may also stress plants in Compositae family.
- Veteran 720 **(Dicamba and 2,4,D)** Non-Selective

Pesticide information collected from:
Purdue University Fact Sheet updated 9/04,
Clemson University Fact Sheet updated 5/03
Alabama Extension Service Fact Sheet, Revised 1999.

Mention of Trade Name implies no endorsement of a single product or associated company. Always read pesticide labels before making any pesticide application. Label information can be obtained from suppliers, or on the web at www.cdms.net and www.greenbook.net. **For a complete list of registered products contact the Office of the Indiana State Chemist.**

Should I mow or cut the kudzu before or after chemical applications? The answer is no. Do not mow or cut the kudzu before or after chemical applications. Allow the kudzu to grow until treatment. A higher the leaf to root ration will likely increase the chances of herbicides translocating to the root system where they can ensure adequate suppression. Performing cut stump herbicide applications to large vines growing up trees may reduce the volume of foliar herbicide needed for coverage and reduce pesticide drift by eliminating spraying high in the tree tops.

Alternative species and Erosion control: In many cases, native vegetation will recolonize a site once the kudzu is removed. However, this may not be true for sites with poor soil conditions or where soil erosion occurs. A soil erosion plan should be implemented at these sites and an alternative, non invasive, non allelopathic plants species should be used to hold the soil until native vegetation can become established. Contact your local soil conservation district for assistance with erosion control and replacement species.

Written By Kenneth W. Cote, Nursery Inspector, Indiana DNR, Division of Entomology and Plant Pathology, 2005. **Photographs** Courtesy of Jody Shimp from the Illinois DNR and Melinda Johnson an Indiana Resident. Updated February 2008.

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