



# Kudzu in the City: Detection of Asian Soybean Rust on Kudzu in Urban Environments in Alabama during the winter of 2006.

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Kudzu (*Pueraria lobata*) is a large, trifoliolate-leaved, semi-woody trailing or climbing perennial vine that belongs to the Legume family. Once established, kudzu plants grow rapidly, extending as much as 20 m (60 ft) per season at a rate of about 30 cm (12 in) per day. Kudzu grows well under a wide range of conditions and in moist soil types. Its preferred habitats include roadsides, abandoned fields, forest edges and vacant lots or the yards of abandoned or little-used buildings where sunlight is abundant. There is an estimated 7 million acres of land in the Southeast infested with kudzu with approximately a quarter million acres in Alabama. Kudzu grows best where winters do not drop below  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ), average summer temperatures are regularly above  $27^{\circ}\text{C}$  ( $80^{\circ}\text{F}$ ), and annual rainfall is 1000 mm (40 in) or more. In areas where winters drop below  $-15^{\circ}\text{C}$ , it will be killed to ground level, but the roots may send up new growth in the spring.

During 2005, Asian soybean rust (*Phakosora pachyrhizi*) was found in 33 counties in Alabama. Whereas soybean was the most commonly found host for the disease the pathogen was also observed in 20 kudzu patches (Figure 1). We anticipated that winter temperatures would kill-back rust-infected kudzu patches, eliminating them as potential sources of inoculum. This would then require the disease to survive, increase and eventually spread from more distal locations such as central Florida, Texas or Mexico and reduce the probability of early season infection of soybean fields in Alabama.

On January 12, 2006, a kudzu patch retaining green leaves was observed under an Interstate overpass in the city of Montgomery approximately 125 miles north of the Gulf Coast (Figure 2). Upon closer examination we observed that the kudzu was infected with *P. pachyrhizi*, the first report of the disease in the United States in 2006. This observation led us to conduct a statewide survey to determine the amount and location of kudzu that survived the winter in Alabama and establish how many of these sites were infected with *P. pachyrhiza*.

Scouting focused on protected areas in urban and rural environments such as buildings, bridges, and trees where kudzu may have escaped damage from winter temperatures. A total of 205 kudzu sites in 15 counties were scouted from mid January through April. When green kudzu leaves were found at a site, leaf samples were collected and incubated for 24 hours then examined using a stereoscope. Samples were considered positive if uredinia and urediniospores of the fungus were observed.

Soybean rust-infected kudzu sites were observed at 11 locations in five counties. Five sites were found in Montgomery County, two in Baldwin and Mobile Counties and one each in Henry and Houston Counties. All 11 positive sites were located in urban areas in small towns or relatively large cities. Kudzu patches were observed near abandoned structures (Figures 3 and 4), under bridges, in backyards of private homes (Figure 5) and in trees. All kudzu patches that were found were infected with *P. pachyrhiza*.

Alabama experienced a relatively mild winter in 2005-2006. In Mobile and Montgomery Counties, the coldest temperatures recorded were 23 F and 20 F, respectively, well above the temperature reported to cause die-back of kudzu. We suspect that the mild temperature combined with the protection provided by these locations allowed the kudzu, and the pathogen to survive the winter months at these locations.

All 11 locations were monitored on a biweekly basis through June. All five kudzu sites in Montgomery eventually went dormant or were destroyed. Uredinia and urediniospores of *P. pachyrhiza* were last observed in Montgomery on May 30. We suspect the extremely dry weather in Alabama during the spring inhibited further development of *P. pachyrhiza* at the Montgomery sites. Rust-infected kudzu sites in Houston, Mobile and Baldwin counties in south Alabama continued to maintain green foliage and eventually grew back as the season progressed. However abnormally dry conditions at these sites apparently restricted significant inoculum build-up of *P. pachyrhizi* within the infested patches.

**In summary:** temperatures during most Alabama winters will kill-back kudzu throughout most of the state. However, during warmer-than-normal winters, the pathogen may survive farther north than previously anticipated. This could pose a significant risk to soybean growers if a mild winter is followed by a warm wet spring that would favor rapid development and early-season spread of the pathogen.



Figure 1



Figure 2



Figure 3

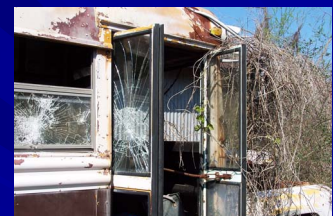


Figure 4



Figure 5