
Atlas Laboratory

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Pueraria montana (Kudzu) Control

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OVERVIEW/HISTORY

Pueraria montana is an invasive species belonging to the Fabaceae family. The Asia native plant species was introduced to the United States in 1876 when it was sold during an exposition for botanical decoration. From the 1930s to the 1950s, soil conservationists believed the plant would be a solution to the soil erosion issue many farmers were experiencing. Therefore, Kudzu was planted all around the south and in other farming regions. At the time, farmers and botanists alike were unaware of the plant's ability to grow at a rapid rate, especially in areas where the winters are mild and the summers are hot. It quickly became apparent that the plant that was once promoted to be a tool used against soil erosion, would soon become a much bigger problem for the environment. Present day, Kudzu, known as the "silent killer" grows one foot a day with vines that can reach up to 100 feet in length. Kudzu engulfs plants and trees shading them from the sunlight. As a result, the native plant species are unable to photosynthesize, ultimately leading to their death. Over time, a ripple effect occurs causing animal and insect species to adapt to the presence of Kudzu. Biodiversity decreases in environments where Kudzu is present and the habitat loss can lead to the extinction of certain species. Currently, scientists across the nation are conducting research to find efforts to better control the invasive species. Scientists at Purdue University have discovered that controlling smaller patches of Kudzu with cattle grazing and weeding methods is effective. It has been documented that smaller patches of kudzu are eventually controlled with these methods. As for larger patches of Kudzu, these require more work. The Indiana Department of Natural Resources has suggested that the timely use of herbicides is effective in managing the species, but not completely getting rid of it. For the last three years I have been documenting the effects of the herbicides, Tordon K and Tordon 101 mixture, on the Kudzu plant.

PLANT TYPE

Broadleaf
Herbaceous
Vine/Climber
Perennial
Seed propagation

USES

Animal feed
Soil erosion control
Dune stabilization
Soil conservation
Flour/starch
Vegetable
Wood/timber
Traditional medicine practices

PREFERRED CLIMATE

Climate Type	Description
Temperate climate	Average temp is between 32°F and 64.4°F. Coldest months average less than 50°F
Warm climate, wet all year	Average temp during winter months is above 32°F. Average warm temp is above 50°F
Warm climate, dry summer	Average temp during winter months is above 32°F. Average warm temp is above 50°F
Warm climate, dry winter	Average temp during winter months is above 32°F. Average warm temp is above 50°F

DATA

Kudzu patches of similar size and age were tested during this experiment. Patches of approximately 25ft² were used within our conservancy plots on campus. Each of the plots were designed to imitate a specific climate. Two plants were placed within each climate. Each plant received either the Tordon K or Tordon 101 herbicide. Growth was documented for each plant for a duration of 30 days. Final growth amounts are documented below with important remarks accompanying.

Temperate Climate

Herbicide	Growth/day average (ft²)	Remarks
Tordon K	57.8 ft ²	1.091 ft/day
Tordon 101	54.9 ft ²	0.997 ft/day
None (control)	61.2 ft ²	1.207 ft/day

Warm Climate, wet all year

Herbicide	Growth (ft²)	Remarks
Tordon K	64 ft ²	1.30 ft/day
Tordon 101	62.8ft ²	1.26 ft/day
None (control)	75.6ft ²	1.687 ft/day

Warm Climate, dry summer *

Herbicide	Growth (ft²)	Remarks
Tordon K	101.5 ft ²	2.55 ft/day
Tordon 101	98ft ²	2.433 ft/day
None (control)	112.4ft ²	2.913 ft/day

Warm Climate, dry winter*

Herbicide	Growth (ft²)	Remarks
Tordon K	103.7ft ²	2.623 ft/day
Tordon 101	100.2ft ²	2.507 ft/day
None (control)	115.6ft ²	3.02 ft/day

* denotes climates where kudzu is believed to thrive

Results/Scientist notes

After 30 days of collecting results, it is apparent that regardless of the climate or herbicide used, Kudzu continues to be an invasive species. It is hard to control no matter where it is found. Kudzu in the temperate and wet climates was more manageable than Kudzu in warm, dry climates. Furthermore, it is noted that Tordon 101 seems to be slightly more effective than Tordon K. Although there is not much of a difference in the amount of Kudzu growth, it may be something

to note and research as well. A concern I have after analyzing my data is that the Kudzu plant in warmer regions almost seems to be growing at a much quicker rate than the general one foot per day. In fact, it seems that the MEP pathway gene, the gene responsible for Kudzu growth, has started to become immune to the herbicides over the short 30 days of testing. This is similar to how humans can develop immunities to certain antibiotics or medicines if used too often. It appears as though the Kudzu plant (at least those in the warmer climates) has developed a survival tactic against the herbicides, a mutation if you will. Therefore, I deem this research incomplete as I am not yet able to find a successful way to control the plant's overwhelming growth rate. I am not sure if there will ever be an answer. More research to come. A solution must be found quickly as it appears this plant is smart and ever-evolving.

Citations

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