

Alternative Controls for Kudzu

by Mary Morrison, photos by Newt Hardie

Some of the biggest challenges facing America's wildlands are silent invaders quietly spreading on and onto public lands. National forests, national parks, wildlife refuges, and many state, county, and city forests are at risk from an influx of non-native invasive plants. These exotic invaders displace native plants and reduce diversity that is critical to native wildlife.

As a public land manager on the Enoree Ranger District of the Sumter National Forest in South Carolina, it is a constant challenge to slow the spread of the non-native, invasive plants. One that I have focused on controlling is kudzu (*Pueraria montana*). On the Enoree Ranger District, kudzu is found in large mature patches usually associated with a gully complex.

Based on my observations and knowledge of the past land use history, I believe kudzu was planted on National Forest land in an effort to control erosion. By the 1930s, past agriculture practices had left much of the South Carolina Piedmont barren and highly eroded. Extensive gully systems resulted, often covering several acres and up to 60 feet deep. During the late 1930s, the Civilian Conservation Corps focused on stabilizing actively eroding gullies and planting pine trees. Also during this period, the Soil Conservation Service paid farmers to plant kudzu on their property. While there is no record of it, it seems likely that kudzu would have been planted on National Forest land too.

Those past practices have created older, well-established kudzu patches on steep and uneven terrain on private and National Forest land within the Enoree district boundary. Controlling kudzu is a long-term commitment. Research has indicated that five to ten years of herbicide spraying is needed to control these older, well-established kudzu patches.

To find out if we could reduce that time frame by incorporating manual treatments, I contacted the Kudzu Coalition, a non-profit group based in Spartanburg, South Carolina. Their mission is controlling kudzu without the use of chemicals. Members have researched the growth patterns of kudzu and use that knowledge to control kudzu primarily using hand tools, mechanical equipment, or barriers.

During one of their Kudzu Kollege training sessions, I learned that kudzu spreads primarily through vegetative methods and not from seed sprouting. Farmers that were paid to plant kudzu planted the crown, which functions like the eye of a potato. Unfortunately a kudzu vine has potential crowns approximately every foot and will readily root from the vine where leaves are present. The good



[top] Healthy kudzu crowns and roots after herbicide treatments; [bottom] These crowns will not be growing back next year.

news is that the roots are not rhizomous, so it does not spread from the roots. Based on these growth patterns, the Kudzu Coalition realized that you don't have to remove the entire root, just cut out the crown to control kudzu. So they developed the "kudzu chop." Most crowns are marble-sized and occur right below the soil surface. With a little practice you can chop the kudzu crown with one easy "chop," using a hand pronghoe or the hoe end of a mattock.

I approached the Kudzu Coalition about using their manual methods on the Enoree's kudzu patches. Could their methods reduce or eliminate the years of herbicide spraying needed to control a mature kudzu patch? The group had been focusing on small patches, generally less than 1-acre located mostly in urban settings. To get a feel for controlling kudzu on national forest land, the Kudzu Coalition brought several school groups out to the Enoree Ranger District and nearby state parks.

There were some challenges, such as digging around, through, and under tree roots to get to the crowns. Other challenges included the size of the patches, the uneven terrain, and the well-established root systems of trees and kudzu plants. Due to the intensive manual labor needed and safety concerns, we felt that the "kudzu chop" alone was not practical, but that a combination of spraying herbicides and manual treatments would be needed.

After some review, we picked a kudzu patch that had been sprayed three times:

- Year 1 (2004) - kudzu foliage sprayed with 2% Garlon 3A;
- Year 2 (2005) - 0.5% solution of Transline;
- Year 3 (2006) - 0.5% solution of Transline.

After the three herbicide applications, many of the kudzu vines had spindly, deformed leaves and we knew that the treatments had been very effective in knocking back the kudzu, but not eradicating it. The test site was 23 acres on flat, level ground located adjacent to the Sedalia primitive camping site, so we called the test site the Sedalia Kudzu Patch.

While we did not know the age of the patch, we were convinced it was an older, mature stand. It was present when I started working on the Enoree Ranger District approximately 16 years ago in 1992 and it had slowly crept into the understory. Aerial photographs from the 1940's show that the Sedalia Kudzu Patch was an open field with terraces. Farming on National Forest land was common at that time and it is possible that the area was farmed and later

planted in kudzu to control erosion. Today, there is still some visible terracing. The remaining kudzu was concentrated in the upper portion of the terraced area that has scattered tree cover.

The Kudzu Coalition agreed to use the “kudzu chop” along with pulling vines and digging up larger crowns for \$100 per acre on the 23-acre site. An herbicide treatment with backpack sprayers probably would have cost \$140 to \$150 per acre. Even with careful research prior to the actual work, we did not foresee all the obstacles. Most of the area was forested, making it difficult to see the scattered and spindly kudzu vines. Also, we had assumed that because the leaves were very spindly and undersized, the roots and crowns would be spindly and undersized as well. Not so!

In October 2007, we chopped or dug up crowns and pulled vines over a period of 4 days. As we chopped and dug, we hung the crowns in the nearby trees to keep them from sprouting (see bottom photo pg. 7). While some roots and crowns were black and rotten, others showed little effect from the previous herbicide treatments. Based on the condition of the roots and crowns, I became convinced that several more herbicide sprayings would have been needed to kill the underground portion of the kudzu. At the same time, we realized that a contractor could not carry out the “kudzu chop” and manual treatments at a cost of \$100 per acre.

In June 2008, we checked on the 23-acre kudzu patch for sprouting. We saw no sprouting from the roots left in the ground.

However, we will wait until late summer or fall to follow-up with additional manual treatments.

This experiment has strengthened my resolve to incorporate the “kudzu chop” along with other manual treatments into our invasive plant control program on the Enoree Ranger District. Eventually, I want to work with local contractors to apply manual methods on a larger scale in some previously sprayed kudzu patches.

I hope at some point to incorporate mechanical methods too. With the help of the Kudzu Coalition, I want to try using their “Weapons of Mass Destruction – (Biomass, that is).” One of these “weapons” is a grapple hook to pull kudzu vines that drape over streams. This method also pulls out smaller crowns and we hope will reduce the number of herbicide applications needed for control.

If you wish to follow our kudzu control efforts in the Sedalia Kudzu Patch or to learn about other non-chemical kudzu control methods, go to the Kudzu Coalition website at www.kokudzu.com. The “kudzu chop” is described at <http://kokudzu.com/KudzuChop.html>. Their informative website not only has information about controlling kudzu, but also has suggestions for working with school groups and volunteers.

Contact the author at mwmorrison@fs.fed.us

**Herbicides / Adjuvants / Service
FOR
Aquatics, Roadside & Utility Rights of Way**

UAP
UNITED AGRI PRODUCTS

Paul Mason, Aquatic /VM Specialist PH 407-718-9154 paul.mason@uap.com	Terry Whitecar, Utility Specialist PH 386-473-3882 terrence.whitecar@uap.com
Joe Collins, Government Acct. Coordinator PH 352-222-0655 joseph.collins@uap.com	Dan McMillan, Aquatic /VM Specialist PH 706-318-3238 daniel.mcmillan@uap.com

Office 863-425-8289, Fax 321-226-0213