

## ABSTRACT:

Japanese knotweed (*Polygonum cuspidatum*) is an invasive species that has quickly become a serious problem both in riparian zones and in upland sites throughout the eastern U.S. It is a herbaceous perennial that can reach heights of 10 feet or more, and is capable of reproducing and quickly spreading by creeping rhizomes and root and stem fragments. Once established, it forms solid colonies that usually choke out all other herbaceous vegetation. This study focuses on planting native species mixtures in plots from which the Japanese knotweed has been suppressed by mowing and herbicide treatments for either one or two years beginning in 2006. The following mixtures were planted on June 1, 2007 and on June 3, 2008: 1) 27 species commercial riparian buffer mixture; 2) native cool season mixture including Virginia wildrye, autumn bentgrass, and fowl bluegrass; 3) Virginia wildrye-bluejoint mixture; 4) Virginia wildrye-prairie cordgrass mixture; 5) 'Hightide' switchgrass; and 6) 'Kanlow' switchgrass. All mixtures established well in 2007. By 16 months after planting, the Japanese knotweed had reestablished itself to some degree in all plots (45-82% of ground cover), and by October 2009, only the riparian mixture provided adequate resistance to Japanese knotweed reinvasion. Only the commercial riparian and Virginia-prairie cordgrass mixtures had adequate establishment after the 2008 seeding. Both mixtures continued to show good suppression of Japanese knotweed in October 2009, suggesting that two years of knotweed control might increase the likelihood of reestablishing desirable plant cover at previously impacted sites.



Figure 1. Aerial view of Lamb's Creek Recreation Area near Mansfield, PA. Each seeding date had 3 reps and can be seen from the photograph.



Figure 2. Picture taken in 2007, at the Japanese Knotweed Site illustrating the dense cover and invasive character of this very noxious, invasive weed.

## Introduction

Japanese knotweed (*Polygonum cuspidatum*) is an invasive species that has become a serious problem both in riparian zones and in upland sites. It's a herbaceous perennial that can reach a height of ten feet or more and is capable of reproducing and quickly spreading by creeping rhizomes and root and stem fragments. Once established, it forms a solid stand choking out all other vegetation. This study focused on planting individual native species and mixtures of native species in plots from which the Japanese knotweed was suppressed with herbicide. We sought to determine which species or mixture of species could compete against Japanese knotweed as it tries to recolonize the plots.

## Methods and Materials

### Plot Treatments

1. Site mowed in June 2006 and then sprayed with Roundup in August 2006
2. Plots laid out, Roundup sprayed May 29, 2007 and planted on June 1, 2007
3. Half of the plots were not planted in 2007 and received an additional year of Roundup spray on September 9, 2007. Stubble was mowed September 27, 2007 and planted June 3, 2008
4. Plots were evaluated in July 2010.

### Six Mixtures in this Study

1. Commercial riparian buffer mixture of 27 species
2. Native cool season grass mixture of Virginia wildrye, autumn bentgrass, and fowl bluegrass
3. Virginia wildrye - bluejoint mixture
4. Virginia wildrye - prairie cordgrass mixture
5. 'Hightide' switchgrass
6. 'Kanlow' switchgrass



Figure 3. View from within the dense knotweed stand. No light can penetrate the ground, therefore outcompetes all other native vegetation.



Figure 4. Picture taken August 2006, of Japanese knotweed plots being sprayed with Roundup.



Figure 5. Plots were laid out on May 2, 2007, sprayed again on May 29, 2007 and then planted on June 1.

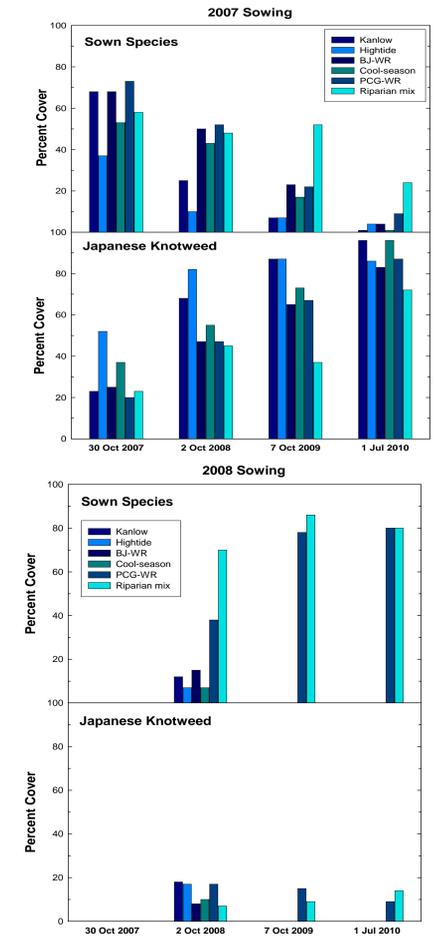


Figure 6. Plot evaluation on September 9, 2007. The knotweed has already started to invade and overtake the native species planted.



Figure 7. Picture was taken in 2010, 3 years after the initial planting. As the image illustrates, the knotweed has overtaken the plot, and grew over 6 feet.

## Results:



## Conclusions:

1. Two years of Japanese Knotweed control was needed to get adequate suppression.
2. The riparian buffer and prairie cordgrass - Virginia wildrye mixtures were most competitive with Japanese knotweed.



Figure 8. The 2008 planting of prairie cordgrass and Virginia wildrye, shows promise to control Japanese knotweed.