

Nepalese Browntop

[*Microstegium vimineum* (Trin.) A. Camus]

Travis D. Marsico, Ph.D., Biological Sciences, Arkansas State University

Gary N. Ervin, Ph.D., Associate Professor, Mississippi State University

John D. Madsen, Ph.D., Extension/Research Professor, Mississippi State University

Wildland



Fig. 1. Nepalese browntop invading a deciduous woodland habitat.

Fig. 2. Nepalese browntop overtaking other understory vegetation.

Fig. 3. Nepalese browntop inflorescence.

Introduction

Problems Created

Nepalese browntop was introduced into the U.S. in the late 1910s, probably escaping from its use as a packing material for porcelain. It was first identified near Knoxville, Tennessee. Nepalese browntop is a groundcover with little wildlife value that successfully displaces native species in the shaded moist habitats where it commonly invades.

Regulations

Nepalese browntop is listed as a Class C noxious weed in Alabama, an Invasive, Banned species in Connecticut, and a Prohibited species in Massachusetts.

Description

Vegetative Growth

Nepalese browntop is an annual grass (family Poaceae). It has long trailing stems that sprawl along the ground producing a lush, uniform groundcover. Mature plants can reach 3' high. Leaves are pale green, lance shaped, approximately 3" in length. Leaves have a distinctive silver-colored stripe that runs off-center down the leaf blade. Nepalese browntop resembles a few delicate native grass species including species in the genus *Leersia*, the cutgrasses. Superficially, Nepalese browntop can also be confused with dicot species in the genus *Polygonum*. Because there are native species that appear similar, correct identification is necessary before implementing control measures.

Flowering

Nepalese browntop begins to flower in late summer and produces small spikes in the axils of leaves and at the tips of the stems. Fruits are produced soon after the flowers, and by the end of autumn the entire plant dies.

Dispersal

Plants can reproduce vegetatively and by seed. Vegetative reproduction is possible because roots can form at any stem node. A single plant can produce between 100 and 1000 seeds, which remain viable in the soil for at least three years. Germination may be improved with soil disturbance. Specific seed dispersal mechanisms are not known, though it is possible that seeds float on surface runoff and stick to the feet of animals.

Spread by

Specific spread vectors are unknown, but likely involve the transport of seed on animals and equipment.

Habitat

Nepalese browntop is a shade tolerant grass that is commonly found in forest understories along streambanks, floodplains, and moist soil regions. It can also be found in more open-canopy areas such as roadsides and roadside ditches and utility rights-of-way. Nepalese browntop is common in disturbed soils and mowed habitats, but it can also invade relatively pristine sites.

Distribution

Nepalese browntop is native to Japan, Korea, China, Malaysia, India and Nepal. In the U.S., Nepalese browntop is found in 24 eastern states, from New York and Massachusetts south to Florida and west to the most northeast county in Texas.

Like so many invasive species, county level records for Nepalese browntop far underestimate the actual distribution in the Mid-South because reporting of species occurrences is not complete. It has been reported from every state in the Mid-South.

Control Methods

Biological

There are no known biological control measures for Nepalese browntop.

Chemical

The herbicides glyphosate, fenoxaprop-P, imazapic, and sethoxydim will control Nepalese browntop when applied to foliage. However, the use of fenoxaprop-P and sethoxydim allows greater selectivity for native plant species.

Mechanical

Because Nepalese browntop is an annual plant that is shallow rooted, it can successfully be removed by hand-pulling, though this is only recommended for small populations. Hand-pulling should be conducted prior to seed formation to reduce additions to the seed bank. Care should be taken to remove the whole plant as broken sections may survive if they are rooted. Mowing of larger populations is effective, though there is significant impact to native plants, especially woody perennial species.

Physical

Burning would likely be effective; however this technique has not been evaluated and would not result in the selective removal of Nepalese browntop. Regardless of the control method utilized, a minimum of three years of large scale treatments are needed to deplete the seed bank; after which remaining plants should be controlled with spot treatments.

Table 1. Suggested chemical control methods for Nepalese browntop.

Herbicide	Broadcast rate
Fenoxaprop-P	1 to 2.5 pints, depending on growth stage
Glyphosate	1 to 2 pints
Imazapic	4 to 6 oz.

References

- CT Invasive Plants Council. 2004. Connecticut Invasive Plant List. Online resource at <ftp://ftp-fc.sc.egov.usda.gov/CT/invasives/WordInvasivesListCommonNameW-Authors4PDF.pdf> accessed [17 February 2009].
- Judge, C. A., J. C. Neal, and T. H. Shear. 2008. Japanese stiltgrass (*Microstegium vimineum*) management for restoration of native plant communities. *Invasive Plant Science and Management* 1:111-119.
- Massachusetts Department of Agricultural Resources. 2009. Massachusetts Prohibited Plants. Commonwealth of Massachusetts. Online resource at http://www.mass.gov/agr/farmproducts/Prohibited_Plant_Index2.htm accessed [17 February 2009].
- Miller, J. H. 2003. Nonnative invasive plants of southern forests: a field guide for identification and control. Gen. Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p. Online resource at <http://www.invasive.org/eastern/srs/index.html> accessed [23 January 2009].
- Sorrells, R. L. 2000. Chapter 80-10-14 Noxious Weed Rules. Alabama Department of Agriculture and Industries. Online resource at www.alabamaadministrativecode.state.al.us/docs/agr/10AGR14.htm accessed [9 February 2009].
- Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. 2002. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service, 82 pp. Online resource at <http://www.invasive.org/eastern/midatlantic/> accessed [23 January 2009].
- USDA, NRCS. 2009. The PLANTS Database. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Online resource at <http://plants.usda.gov> accessed [23 January 2009].

Gary N. Ervin, Ph.D.
Department of Biological Sciences
Mississippi State University, MS 39762
(662) 325-1203
gervin@biology.msstate.edu

