

# JAPANESE STILTGRASS

*Microstegium vimineum*

(formerly *Eulalia viminea*)



TARGET

This Best Management Practice (BMP) document provides guidance for managing Japanese Stiltgrass in the Oak Openings Region of Northwest Ohio and Southeast Michigan. This BMP was developed by the Green Ribbon Initiative and its partners and uses available research and local experience to recommend environmentally safe control practices.

**INTRODUCTION AND IMPACTS**— Japanese Stiltgrass (*Microstegium vimineum*) is native to southeast Asia and was accidentally introduced to North America through its use as packing material for imported goods. It was first found growing wild in TN in 1919. The first MI infestation was identified in 2017. Japanese Stiltgrass (or “J. Stiltgrass”) is now widely distributed in North America and is present in OH and MI.

The Midwest Invasive Species Information Network (MISIN) has over 470 reports of Japanese Stiltgrass (orange dot) near the Oak Openings Region (OOR, green line), all just west of Ann Arbor. It is currently found in only two of the OOR’s 7 counties and is absent in most of OOR’s natural areas (currently six occurrences known within the OOR, five of these in OH). However, J. Stiltgrass has demonstrated the ability to establish and spread in healthy and disturbed habitats of the OOR. This includes quality habitats such as floodplains, dry to mesic woods and partially shaded woodlands. Indications are that this species is at the early stages of invasion in the region, making reporting critical to preventing its spread.

Japanese Stiltgrass has many characteristics that contribute to its success as an invader. It spreads rapidly following disturbance and easily forms dense monocultures. J. Stiltgrass is reproductively flexible, with the ability to self- or cross-pollinate. It is well adapted to shade and only requires 5% of full sunlight to reproduce. J. Stiltgrass limits the light and nutrients available to native species, and may also increase soil pH while decreasing litter and organic soil horizons. Higher numbers of nonnative earthworms are found in areas infested with J. Stiltgrass, while small insect diversity is reduced. J. Stiltgrass invasion can render areas less hospitable for ground-nesting birds and some turtles. J. Stiltgrass severely degrades the quality of the habitats in which it becomes established.

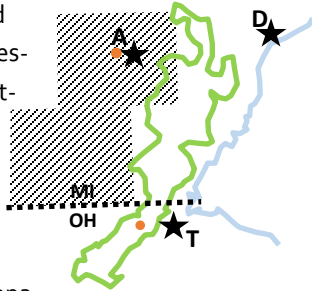
**SIMILAR SPECIES**—Japanese Stiltgrass is similar in appearance to several native and non-native species in the OOR. A few of the most similar are listed here, but there are undoubtedly others, including non-grasses. Arthraxon grass (*Arthraxon hispidus*, non-native) has broader leaf blades with heart-shaped bases. Whitegrass (*Leersia virginica*, native) is a perennial grass with a thicker, more developed root system and hairy nodes. It does not form dense stands and lacks the mid-rib stripe of J. Stiltgrass leaves. Northern shorthusk (*Brachyelytrum aristosum*, native) has leaf veins “in a pattern resembling an irregular brick wall.”

Others: Nimblewill (*Muhlenbergia schreberi*), Deer tongue/Panic grass (*Dichanthelium* spp.),

Crabgrass (*Digitaria* spp.), Smartweeds (*Polygonum* spp.), Dayflow-ers (*Commelina* spp.), etc.

**HABITAT**—Japanese Stiltgrass prefers partial shade and moist soils, but can grow in a wide range of conditions. It will not survive in standing water though its seeds can germinate even after long periods of inundation. In the OOR, J. Stiltgrass is only known from six occurrences; more specific habitat data is being compiled and new information will be updated to the BMP.

**IDENTIFICATION**—Habit: Annual, warm-season grass. Can reach 4’ tall, but often prostrate and sprawling. Colonial and freely branched, forming dense mats.



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**Leaves:** Lime to pale green with a silvery streak of hairs along the midrib. Alternate and 1-5” long by 1/2” wide. Pointed at both ends and slightly asymmetrical. Margins are entire. Short (0.5 mm), membranous ligule with no auricles. Sparsely hairy to hairless on leaf surfaces, with hairy sheath margins and collars. Turn distinctive orange-tan after frost and persist through winter.

**Stems:** Slender, wiry and hairless. Erect or reclining, branching near the base. Can grow to 4’ long. Green, changing to purple and brown near the base or late in the season.

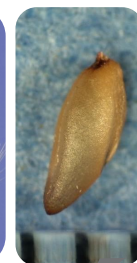
**Flowers:** Inconspicuous. In thin, hairy, branched spikes at the end of the stems or in the leaf axils. Spikelets are 1-3” long.



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**Fruits/Seeds:** Small (3 mm) ellipsoid grains. Husked and yellowish to reddish in color. A single J. Stiltgrass plant can produce up to 1000 seeds annually in optimal conditions.

**Roots:** Shallow, fibrous roots. Can grow prop roots from nodes.

Japanese Stiltgrass Timeline	J	F	M	A	M	J	J	A	S	O	N	D
Life History	Winter Dieback		Germination		Summer Growth Period				Flowering—Fruiting		Winter Dieback	
Hand Pull	Can pull any time, but most effective in July-September.											
Mow						Cut to ground.						
Spray	Pre-emergent				Post-emergent							
Burn									Burn before seed set.			

**REPRODUCTION AND DISPERSAL**—Reproduction of Japanese Stiltgrass is primarily by seed. A square meter of J. Stiltgrass can produce up to 50,000 seeds/year. Seeds can remain viable in the soil for 5 or more years. They are dispersed by water, animals, humans and equipment. **Thoroughly cleaning footwear, clothing and equipment is a critical prevention measure for J. Stiltgrass in the OOR. Land managers should consider incorporating pre- and post-project equipment cleaning into contracts.**

**REPORTING**—J. Stiltgrass is identified as a Target species in the OOR. Reporting J. Stiltgrass is essential for its control. It is fairly easy to identify year-round. Mountain bike, ATV, and recreational areas should be assessed annually. Report J. Stiltgrass at [www.misin.msu.edu](http://www.misin.msu.edu) and also to the county or local CWMA or CISMA.

**CONTROL**—The best control is integrated control. Management plans should focus on the prevention of seeding. Annual follow-up is essential in the treatment of J. Stiltgrass, and monitoring should include at least 20' buffering of the original patch. Sites should be monitored and treated for several consecutive years to ensure the seed bank is exhausted.

**Chemical:** The following recommendations have been compiled from groups working in MI, OH, PA, NC, IL, ME, IN, and IA. It is the responsibility of the applicator to ensure compliance with herbicide labels and regulations when planning chemical treatment. Follow-up treatments should take place six weeks after cutting or initial application.

**Foliar Spraying**—Best for large, dense populations. The following table lists several post-emergence options but pre-emergence treatments are also available. Herbicides should be used with appropriate adjuvants at label-recommended rates.

**Mechanical:** Hand pulling and mowing can both be used to control J. Stiltgrass. Plants are easy to pull, thanks to their shallow roots. When mowing, the closer the plants are cut to the ground, the better. A string trimmer may be the most practical option for mowing. The best time to apply either method of control is late in the growing season, before seed set. This prevents mature J. Stiltgrass from seeding and prevents banked seeds from germinating and seeding before winter. Mowing in early- to mid-summer can be used to weaken plants before the application of herbicide and reduce the amount of

Herbicide	Trade Names	Concentration
Glyphosate	Aquamaster®, Rodeo®, Roundup®	0.25-2%
Imazapic	Plateau®, Journey®, Panoramic®	4-6 oz/ac
Sethoxydim	Vantage®, Poast®, Grass-Out®	1-1.5%
Glufosinate	Finale®	4 qt/ac
Fenoxaprop	Acclaim Extra®	0.02% AI
Fluazifop	Fusilade® DX, Grass-B-Gon®	0.5% or 12-24 oz/ac
Fenoxaprop + Fluazifop	Fusion®	0.5%
Clethodim	Envoy®	0.1% AI
Quizalofop	Assure® II	4 oz/ac

herbicide necessary, but will not control J. Stiltgrass on its own. In all mechanical removal scenarios, ensure clothing and equipment are cleaned and dispose of all plant material appropriately (see below).

**Biological:** In its native range, Japanese Stiltgrass is prone to a variety of plant pathogens. A leaf blight fungal disease has been found on J. Stiltgrass in the U.S. and is being evaluated for use as a biological control agent. Otherwise no biological controls exist and no animals are known to feed on J. Stiltgrass.

**Prescribed Fire:** Little information is available on J. Stiltgrass's response to burning. Research suggests that fall fires can remove cover/biomass and kill J. Stiltgrass before it seeds, but will not damage the seed bank. Fire may encourage seed germination, so plan control accordingly. Also consider that fire creates disturbed areas easily colonized by J. Stiltgrass.

#### DISPOSAL

- If no flowers/seeds are present: pulled or dug plants can be left on site if roots are not in contact with the soil.
- If flowers/seeds are present: plants should be incinerated, or sealed in plastic bags and disposed of in a landfill.
- Ensure all plant parts are dead before composting, either by drying completely or liquefying in plastic bags.



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