Japanese stiltgrass (Microstegium vimineum)

Description

- Refer to the DCNR Invasive Plants page, and the stiltgrass factsheet.
- Herbaceous, annual, warm-season grass.
- Tolerant of full sun to heavy shade.
- Has a sprawling, almost vine-like growth habit, with a canopy height between 12 and 36 inches.
- Seedheads emerge late-August to early-September.
- Infestations commonly start along road or trail edges, then spread outward.

Management Keys

As a plant, stiltgrass is not hard to suppress. However, what you are really trying to manage is the persistent seed bank in the soil. New infestations can potentially be contained, but for well-established infestations, the goal is to create opportunities to release or plant desired vegetation. In this scenario, the stiltgrass does not go away, but you can at least establish a desirable plant community that provides ecological function with stiltgrass present.

Early Detection - Target the Seedbank

To contain new patches of stiltgrass, you have to prevent further seed production and spread, and prevent additional introduction.

Prevention is Easier

If stiltgrass is just appearing on your site, determine its origin. Aggregate and soil for roadwork are potential sources, as is contaminated equipment that worked in infested sites. Roadwork and timber harvests where stiltgrass is already established spread it even further.

Mechanical Control

Small infestations of stiltgrass are readily pulled. A string trimmer can be effective later in the season if you cut the stiltgrass off at ground level (Figure 1). A mower cuts too high and will not work, as stiltgrass is a common weed in turf.

Recommended Herbicides

Stiltgrass is susceptible to a number of herbicides, allowing you to tailor a program that fits your schedule and the plant community you are trying to preserve.

PREEMERGENCE

You can achieve selective preemergence (PRE) control with herbicides such as *prodiamine* ('ProClipse') or *pendimethalin* ('Pendulum AquaCap'). These herbicides enter the seedling through the root tip and prevent further root growth. They do not injure established vegetation. However, they are very insoluble in water, so they must be applied well in advance of germination to move into the soil where the seed are. If these herbicides are not present when the root emerges from the seed, they are not effective. This is why these herbicides do not affect vegetation with established roots.

To enhance the activity of PRE treatments and provide flexibility for application timing, you can add a low rate of the herbicide *flumioxazin* (‘SureGuard SC’) or *imazapic* ('Plateau'). These herbicides will suppress germinated seedlings while the insoluble herbicide moves into the upper layer of the soil to prevent further germination. This combination allows you to delay application while maintaining selectivity.

POSTEMERGENCE

Three postemergence (POST) herbicides that are effective against stiltgrass include glyphosate (‘Rodeo', ‘Aquaneat’), glufosinate (‘Finale’), and quizalofop (‘Assure II’). Glyphosate is non-selective and systemic, and will injure all treated vegetation. However, glyphosate can be applied at very low rates that will reduce injury to non-target species. Glufosinate is also non-selective, but translocates less, so the damage to treated plants will typically be limited to the foliage where the spray contacted the plant. Stiltgrass will be controlled, but most perennial plants will regrow after treatment.

The herbicide *quizalofop* only injures grasses. Stiltgrass is affected by *quizalofop* at low rates, so you can control stiltgrass but leave most native grasses largely intact. There are several grass-only herbicides that would provide similar effects as *quizalofop*, including *clethodim* (‘Envoy Plus’), *fluazifop* (‘Fusilade II), and *sethoxydim* (‘Segment II’).

Another useful herbicide is *sulfometuron* (‘Oust XP’). It is used primarily in industrial and forestry settings, and is effective applied PRE or POST. It is quite active against a wide range of herbaceous species, and therefore is not particularly selective. It is most useful where the objective is releasing or establishing trees, such as establishing forest buffers or conducting silviculture practices.

Strangely enough, the broadleaf herbicide *aminocyclopyrachlor* (‘Method’) is also quite active against stiltgrass. You can include ‘Method’ in selective mixtures

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(i.e. no *glyphosate*) that could be used to control invasive shrubs and broadleaf weeds, and also suppress stiltgrass while leaving desirable grasses largely intact.

Alternate Groundcover

We have not observed any seed mixes or native plant communities that exclude stiltgrass. However, there are many situations where the ecological function of a site is improved by re-establishing native vegetation. Where stiltgrass is well established, you can direct your efforts towards temporary suppression to create a window of opportunity to establish meadow plantings, successional habitat, or reforestation plantings. Your objective in this scenario is to release the planting and allow it to become vigorous enough to compete with the stiltgrass and tolerate its presence after you stop the suppression treatments. An otherwise ecologically functional plant community with stiltgrass present may be the best we can expect.

Figure 1. The objective of stiltgrass management is to prevent seed set and limit competition earlier in the season. Stiltgrass is effectively controlled with preemergence or postemergence herbicide applications, and small infestations can be hand-pulled or cut at ground level.

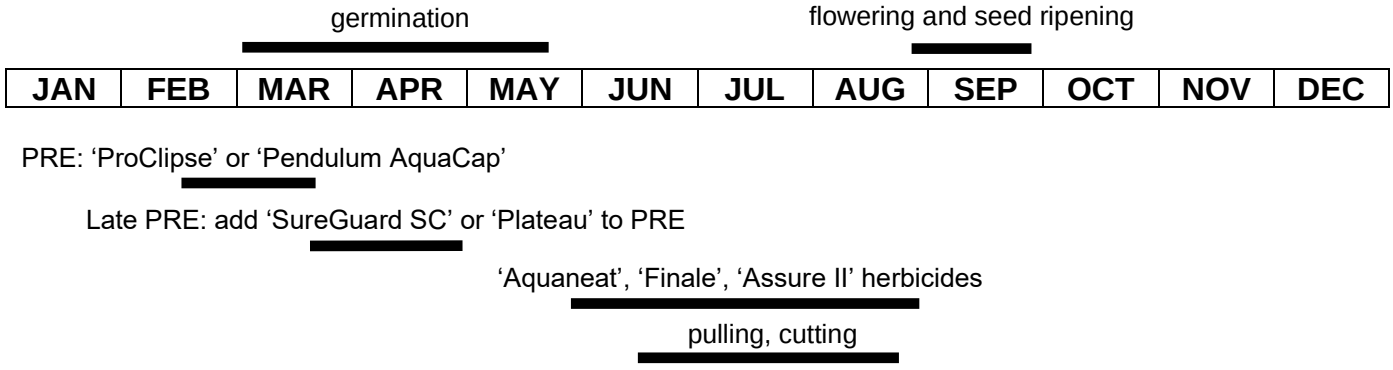

Table 1. Prescriptions for elimination of Japanese stiltgrass focus on reducing competition as early as practical in the season and preventing seed set. Stiltgrass is susceptible to a number of herbicides suitable for use in parks.

Timing	Treatment	Product Rate (oz/ac)	Comments
Before stiltgrass germination (apply early to mid-March)	*PRE* 'ProClipse' or 'Pendulum AquaCap'	16 to 32 or 64 to 128	Selective preemergence applications of *prodiamine (*'ProClipse') or *pendimethalin* ('Pendulum AquaCap') prevent stiltgrass establishment, and have little effect on plants that are already present. These herbicides move very slowly into the soil, and if used alone need to be applied 2 to 3 weeks prior to germination. This approach is also effective against mile-a-minute (*Polygonum perfoliatum).*
Before or soon after stiltgrass germination	*'Late' Preemergence* PRE plus 'SureGuard SC' or 'Plateau'	1 oz for either product	Adding a very low rate of *flumioxazin* ('SureGuard SC') or *imazapic* ('Plateau') to a PRE treatment allows you to apply closer to, or even after stiltgrass germination, with minimal injury to desirable vegetation. Both these herbicides are soil active, and have postemergence activity. Small emerged seedlings will be controlled and there will a short window of residual activity to allow the less soluble 'Proclipse' or 'Pendulum AquaCap' to move into the soil to prevent subsequent germination.
mid-May through August	*POST:* 'Aquaneat or 'Finale' or 'Assure II'	8 to 96 oz or 64 oz or 4 oz	*Glyphosate ('AquaNeat', 'Rodeo')* and *glufosinate* ('Finale') are non-selective herbicides with no soil activity. 'Finale' only injures the parts of the plant it contacts, while 'Rodeo' is systemic, and will kill the entire plant. 'Assure II' (*quizalofop)* only affects grasses, but the rate used for stiltgrass is low enough that desirable grasses such as whitegrass (*Leersia virginica),* deertongue (*Dicanthelium clandestinum*) and nimblewill (*Muhlenergia schreberi)* are only temporarily affected.
mid-June to late August	pulling or cutting	n/a	Small infestations of stiltgrass can be mechanically controlled. If you're cutting, use a string trimmer and cut the stiltgrass at the soil surface to prevent resprouting from the lower nodes of the stem. Current thinking is to wait until mid-June to prevent a second flush of stiltgrass germination, and finish before seedhead emergence at the end of August.