GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Microstegium vimineum***

Microstegium vimineum 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name

Nepal microstegium (English), Nepalese browntop (English), Nepal grass (English), Vietnamese stilt grass (English), Asian stilt grass (English), Japanese stilt grass (English), annual jewgrass (English), bamboo grass (English), Mary's grass (English), Japanese grass (English), flexible sesagrass (English), Chinese packing grass (English)

Synonym

Eulalia viminea , (Trin.) Kuntze
Microstegium imberbe , (Nees ex Steud.) Tzvelev
Microstegium willdenovianum , Nees ex Lindl.
Pollinia imberbis , Nees ex Steud.
Pollinia viminea , (Trin.) Merr.
Pollinia willdenoviana , (Nees ex Lindl.) Benth.
Eulalia viminea , (Trin.) Kuntze var. *imberbis* (Nees ex Steud.) Kuntze
Eulalia viminea , (Trin.) Kuntze var. *variabilis* Kuntze
Microstegium aristulatum , Robyns & Tournay
Pollinia imberbis , Nees var. *genuina* Hack.
Pollinia imberbis , Nees var. *willdenoviana* (Nees) Hack.
Andropogon vimineium
Microstegium vimineum , var. *imberbe*

Similar species

Leersia virginica, Brachyelytrum erectum, Brachyelytrum septentrionale, Polygonum persicaria

Summary

Microstegium vimineum is an annual grass native to Asia. It grows quickly, produces abundant seed and easily invades habitats that have been disturbed by natural and anthropogenic sources. Microstegium vimineum occupies riparian habitats, lawns, woodland thickets, damp fields and roadside ditches. It is usually found under moderate to dense shade in moist conditions, but it does not persist in areas with periodic standing water, or in full sunlight. The coldest winter temperature at which invasive populations occur is approximately -21° to -23° C. It occurs in soils of average potassium and phosphorus levels but high in nitrogen. Soil acidity, however, may limit nutrient availability. It spreads by rooting at nodes along the stem, and fruits and seeds disperse by water and on animals. Also, fruits have been transported on vehicles, and in hay and soil.

view this species on IUCN Red List

Species Description
Microstegium vimineum is an annual grass which resembles a small bamboo plant. It can be recognised by its pale green lance shaped leaf with a distinctive silver midrib (Pennsylvania Field Guide, 2004). Young plants grow upright, but as the stem elongates, it becomes straggling and decumbent, with only the upper part of the stem upright and the lower part in contact with the ground, where the lower nodes root (Joan Ehrenfeld., pers.comm., 2005). Tu (2000) states that *M. vimineum* is a shade tolerant, annual grass (family Poaceae). It is usually 6-10dm in height, and the reclining stems can grow up to 1.0m long. In unfavourable conditions, the plant can be as little as 1-2 dm tall, and is capable of flowering in this condition (Joan Ehrenfeld., pers.comm., 2005). Tu (2000) further states that its culms (stems) are typically branched, rooting at the lower nodes, and the nodes and internodes are smooth and hairless. The lanceolate leaf blades are 5-8cm long, 2-15mm wide, sparsely pubescent on both surfaces, and distinctly tapered at both ends. The ligules are membranous, usually ciliate, and are 0.5-2.0mm long. The terminal or axillary inflorescence is a raceme, 2-7cm long, with an elongate peduncle and an angled disarticulating rachis. The hirsute fertile spikelets are deciduous, and occur in pairs, with one spikelet sessile and the other pedicellate. The glumes are equal in length (4.5-5.0mm) and awnless. The first glume is flat and 2-3 veined. The second glume is keeled and 3-veined. There are two lemmas per spikelet, with the lower one sterile and the upper, fertile one awnless or often with a slender awn 4-8mm. Both cleistogamous (flowers closed at pollination) and chasmogamous (flowers open) conditions have been reported for *M. vimineum* in Japan, with the axillary flowers all being cleistogamous. Cleistogamous panicles are contained in the upper 1-2 leaf sheaths, and remain appressed to the stem; these seeds are apparently dispersed as a unit in pieces of dead litter. The plant produces a very sparse, short fibrous root system (Joan Ehrenfeld., pers.comm., 2005). The fruit or caryopsis (grain) is yellowish to reddish, and ellipsoid (2.8-3.0mm) in shape. *M. vimineum* can be distinguished from other grasses by its thin, pale green, tapered leaf blades, and by its multiple spikelets that may be either terminal or arising from leaf axils. The alternate leaves have a silvery stripe of reflective hairs down the middle of the upper leaf surface. In the fall, identification becomes somewhat easier after the plant develops a slight purplish tinge (Tu, 2000).

Notes
VANHP (Undated) states that it was formerly known as *Eulalia vimineum*.

Lifecycle Stages
Tu (2000) states that *M. vimineum* relies entirely on its seed bank for its annual recruitment. Seeds may need a period of stratification (cool temperatures and high moisture) before they will germinate (Woods, 1989, in Tu, 2000). Seeds stored in the soil may remain viable as long as five years (Barden 1991, in Tu, 2000). Seeds may have low germination rates (Woods, 1989, in Tu, 2000), but each plant produces many seeds. Seeds are also able to survive submersion in water for periods of up to 10 weeks. Seeds can germinate while under water, but the plants do not grow (Barden, 1991, in Tu, 2000). If standing water is removed, more seeds will germinate shortly afterwards.

Uses
Tu (2000) cites that in the early 1900s, *M. vimineum* was used extensively as a packing material for porcelain, especially fine China porcelain, which may have contributed to its invasion into the United States. Culms of this grass have also been used for basket weaving. It has not been documented as being intentionally planted as an ornamental, for erosion control, or for forage.

Habitat Description
Swearingen (1999) states that *M. vimineum* occurs on stream banks, river bluffs, floodplains, emergent and forested wetlands, moist woodlands, early successional fields, uplands, thickets, roadside ditches, gas and power line corridors and home lawns and gardens. It readily invades and is most common in disturbed, shaded areas like floodplains that are prone to natural scouring, and areas subject to mowing, tilling and other soil disturbing activities. It appears to be associated primarily with moist, acidic to neutral soils that are high in nitrogen. It occurs opportunistically in areas of open soil that are generally not already occupied by other species.
M. vimineum can also occur on upper forested slopes, particularly under disturbed canopy (including natural disturbances such as blowdowns); indeed, it often colonizes the bare soil of tree-throw mounds in otherwise uninvaded areas. It is also frequently found along hiking trails, despite dry and rocky conditions. A study of its distribution in several forested areas in New Jersey did not reveal a preference for any particular slope position, slope angle, or exposure direction (Kourtev *et al.* 1998), suggesting that it can occur on a very wide range of forested conditions.
Tu (2000) observes that most sites invaded by *M. vimineum* in the United States have acidic soils (pH 5.8 to 4.8), but some populations are on soils derived from limestone or marble with surficial soil that is neutral or only slightly acidic in reaction. He further states that the overall acidity of the soils, however, may limit nutrient availability. Soils are usually moist, and are often well-drained silty loams, sandy loams, or loams. Clay was not a significant component of the upper soil horizons in any of the soils invaded by *M. vimineum* (Hunt and Zaremba 1992, in Tu, 2000). No information was found regarding the optimal growing temperatures or the temperature limits of this species. The coldest winter temperature at which invasive populations of *M. vimineum* occur is approximately -21° to -23° C (Redman, 1995, in Tu, 2002). It can grow and produce seeds with as little as 5% full sunlight, but maximum growth and seed production occurs at 25-50% full sunlight (Winter *et al.*1982, Horton and Neufeld, 1998, in Tu, 2000).

Reproduction
Derr and Tech (2004) state that Japanese stiltgrass has a fibrous root system. Seeds gereminate in late spring, and plants reach flowering status in mid-autumn. Swearingen (1999) states that *M. vimineum* is a clonal species that spreads by rooting at nodes along the stem. New culms emerge from each node. Each plant can produce an estimated 100 to 1,000 seeds. Once established at a site, seed stored in the soil will ensure regrowth for several to many years.

Nutrition
Soils on which *Microstegium vimineum* occur are typically average in levels of potassium and phosphorus and high in nitrogen (Redman, 1995, in Tu, 2000). Kourtev *et al.* 1998 found that the species is associated with high nitrate concentrations and less acidic conditions than uninvaded soils. Also, Kourtev *et al.* 1999 showed that *M. vimineum* has high levels of nitrate reductase in its leaves, suggesting a preferential uptake of nitratas a N source.

General Impacts
Tu (2000) reports that *Microstegium vimineum* is capable of invading wildland areas and swiftly replacing natural communities with nearly monospecific stands. It is generally slow to invade undisturbed areas but rapidly fills disturbed areas such as flood-scoured streamsides and sewer line rights-of-way that are mowed once a year. Once established, *M. vimineum* is able to crowd out native herbaceous vegetation in wetlands and forests within three to five years (Hunt, 1992; Barden, 1987, in Tu, 2000). Additionally, *M. vimineum* may be responsible for altering natural soil conditions, creating an inhospitable environment for many native species. In areas that have been invaded by *M. vimineum*, both litter and organic soil horizons were thinner than in uninvaded areas, and that the pH of soils in invaded sites was significantly higher than in uninvaded sites (Kourtev *et al.* 1998, in Tu, 2000). There is no indication that *M. vimineum* produces allelopathic chemicals (Woods, 1989, in Tu, 2000).
Established populations of *M. vimineum* usurp quality nesting habitat from quail and other wildlife. In addition, it creates excellent habitat for rats, especially cotton rats (*Sigmodon* spp.), which often prey on the nests of native bobwhite quail (*Colinus virginianus*) and attract other predators as well (A. Houston, pers. comm., in Tu, 2000). *M. vimineum* also appears able to change soil functions by raising pH and immobilising N (Ehrenfeld *et al.* 2001). Kourtev *et al.* 1999 found that *M. vimineum* populations were associated with higher densities of exotic (European) earthworms than nearby uninvaded soils

Management Info
Tu (2000) states that manual and mechanical, environmental/cultural, and chemical methods are all useful to varying degrees in controlling *M. vimineum*.
For more details please see *management information*.

Principal source: Tu, 2000. Element Stewardship Abstract for *Microstegium vimineum*

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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ALIEN RANGE

[1] PUERTO RICO
[32] UNITED STATES

[1] TURKEY

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Summary: Presentation outlining biology and control options for Japanese stiltgrass.
Jones, B.P., Mortensen, D.A., and Peskin, N. 2004. *Northeastern Weed Science Society 2004 Symposium. Japanese Stiltgrass (Microstegium vimineum) Ecology and Management Workshop*. [Accessed 26 November 2004]
Summary: Presentation outlining control options for Japanese stiltgrass in the Rothrock State Forest, Pennsylvania.
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Tu M., 2000 *Element Stewardship Abstract for Microstegium vimineum*. The Nature Conservancy. l [Accessed 1 June 2003]
Summary: An Element Stewardship Abstract containing detail report on description, distribution, dispersal methods, impacts, habitats and control.

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Summary: Summary on description, habitat, threats and control.

General information
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Summary: This paper gives information of a study looking at the effects of *M. vimineum* on black-legged tick nymphs habitat requirements.
Corrigan E. E., Undated *Catalog of Species: Microstegium vimineum (Japanese stilt grass)*, Invasive Plant Atlas of New England, New England. [Accessed 1 June 2003]
Summary: Report on description, similar species, habitat and reproductive/dispersal mechanisms.
Drake, S.J., Weltzin, J.F., and Parr, P.D. 2003. Assessment of non-native invasive plant species on the United States Department of Energy Oak Ridge National Environmental Research Park. *Castanea*. 68 (1): 15-30.
Summary: This paper outlines the major weeds on the United States Department of Energy Oak Ridge National Environmental Research Park in Tennessee, which includes *M. vimineum*.
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Summary: This paper looks at the effects *M. vimineum* has on soil function in eastern deciduous forests in the USA.
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Summary: Earliest paper to document distribution of the species in eastern US, plus an analysis of its synonymy, correct generic placement, and the variability of awn/awnless character of the glume.
Gibson, D.J., Spyreas, G., and Benedict, J. 2002. Life history of *Microstegium vimineum* (Poaceae), an invasive grass in southern Illinois. *Journal of the Torrey Botanical Society*. 129 (3): 207-219.
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Summary: This paper describes the spread of *M. vimineum* from New Jersey into New York and Connecticut.
ITIS (Integrated Taxonomic Information System), 2005. Online Database *Microstegium vimineum*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from:
http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Microstegium+vimineum&p_format=&p_ifx=plglt&p_lang= [Accessed March 2005]
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Summary: The study shows that *M. vimineum* is associated with higher densities of exotic earthworms than nearby uninvaded soils, and that it has higher concentrations of nitrate reductase in its leaves (an indicator of the preferential use of nitrate as an N source) than native shrub and most tree species.
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Pennsylvania Field Guide. 2004. Common Invasive Plants in Riparian Areas.
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Summary: Short list of common names and synonyms.