

REPORT ALL SIGHTINGS

of this Dangerous, Dreaded Invasive

WAVYLEAF GRASS OR WAVYLEAF BASKETGRASS

Menaces Forests, Hitchhikes on Animals and People



Wavyleaf grass, shown here in Shenandoah National Park, aggressively colonizes shady, moist sites and can obliterate wildflowers, ferns, and tree saplings in its steadily advancing path.

The Culprit

This fearsome, invasive grass may be the worst of the worst. And the worst is yet to come, because wavyleaf grass only recently arrived in Virginia! Because it thrives in dense shade and its seeds hitchhike for miles and miles by gluing themselves to animal fur and clothing -- falling off days or months later -- the consequences of not eradicating wavyleaf ASAP are dire. Where it has been found so far, this perennial grass thickly blankets the ground and forms continuous carpets in short order. To date, these carpets have been found only where the forest was already degraded by deer over-browsing, where the grass



After walking through a colony of wavyleaf that was in seed, this dog emerged covered with sticky seeds. Photo: Vanessa Beauchamp.

had little competition. Wildlife scientists are concerned that wavyleaf's rapid growth and dense roots and foliage have the potential to smother wildflowers, ferns, and other ground-layer plants, and to prevent forest tree and shrub regeneration in intact forests. This is happening with Japanese stiltgrass. Wavyleaf could ruin our woodlands and our wild and timber forests. When hikers, hunters, or their dogs walk in this grass anytime from mid-August through November, they emerge slathered with wavyleaf's sticky, difficult-to-remove seeds.

Once established in huge colonies, the grass dramatically diminishes biodiversity of insects, birds, mammals, and native plants. If it runs rampant in Virginia, as it has in Maryland, wavyleaf could impact our economy by imperiling timber profits, ruining recreational, hunting, and

tourist opportunities, and robbing Nature of its the variety and beauty. Virginia lists wavyleaf as a noxious weed, making it illegal to knowingly grow or transport it. With enough funding and manpower, it might not be too late to contain and control this menace. Each delay in control measures, however, makes this noxious weed's exponential growth more difficult to contain.

Wavyleaf grass was first discovered in the U.S. in Maryland in 1996 in and around Patapsco State Park near Baltimore. Now, it is out of control throughout much of Maryland and has crossed into D.C. and Virginia. In 2016, it was found in West Virginia and Pennsylvania. The grass was first found in Virginia in Shenandoah National Park at a site in Rockingham County in 2005. As of January 2017, wavyleaf is known to be in 15 Virginia counties: Albemarle, Arlington, Augusta, Clarke, Culpeper, Fairfax, Fauquier, Greene, Page, Madison, Nelson, Rappahannock, Rockingham, Spotsylvania and Warren.

Wavyleaf grass (*Oplismenus undulatifolius* formerly *Oplismenus hirtellus* spp. *undulatifolius*) was once suspected of having invaded the landscape from a carelessly discarded houseplant -- one grown as a hanging-basket. However, recent genetic studies show that the invasive grass is a close match to the ecotype found in Caucasus Mountains of Russia. The grass might have hitched a ride to the U.S. on someone's clothing or hiking boots, but the specifics are an unsolved mystery.

In 2012, the U.S. Department of Agriculture Animal and Plant Health Inspection Service assessed wavyleaf and ranked it High Risk for invasion. Scientists used a climate-matching tool based upon the plant's known worldwide distribution. They estimated that the nonnative invasive grass could overrun forests in 30% of the U.S. because wavyleaf has the potential to grow in USDA Zones 6 -13 where rainfall averages 30 to 100 inches per year. It must be stopped now, before it is too late!

Known Hangouts

Wavyleaf hangs out in the shade -- sun is its enemy. It thrives in shady sites from very moist to somewhat dry. It does great in very deep shade, the kind that challenges many forest plants. Wavyleaf is found in woodlands and forest settings in low wet areas, along streams, and in bottomlands, as well as on steep wooded slopes and along trails.

You might find it first at the base of a tree. It stops dead, however, at the forest edge and does not invade fields and meadows. This nasty plant chums around with Japanese stiltgrass, another invasive, in the shade, but does not follow it into the sun. You may find wavyleaf growing beneath Japanese stiltgrass, which grows much taller.



Wavyleaf at base of tree.

Modus Operandi

This conniving plant really knows how to travel. Wavyleaf's seeds, which form in profusion in late summer and fall, feature long, pointed tips (awns). The awns grab onto passing animals, people, and vehicle

tires to hitch a ride. The seeds hang tight because the awns exude a glue-like substance. Seeds can adhere to fur and clothes for days until they dry or are physically rubbed or brushed off. Deer most likely are the primary culprits in spreading the seed from one location to another. Bucks, in particular, go on long excursions during rutting and hunting season, which coincides with wavyleaf seed production. Bears, whose territories encompass a radius of 2 to 15 miles, may travel up to 100 miles in search of food and may be guilty of long-distance seed dispersal. Hunters, hikers, and their dogs also probably unwittingly carry wavyleaf seed great distances – even hundreds of miles. The seeds can



A new colony of wavyleaf is beginning to crowd out this ebony spleenwort fern, which will be smothered in a year or two.

be moved and carried downstream by water. Any seeds remaining on the plants fall to the ground in winter, where they may later germinate. No one knows how long seeds are viable in the soil.

Wavyleaf grass is a perennial, which gives it a decided advantage over invasive annuals such as Japanese stiltgrass. It emerges from dormancy and starts growing rapidly in April. Because it is a perennial, it has more power than an annual to thrust through a deep leaf litter on the forest floor. This, and its extreme shade tolerance, allows it to grow under a dense tree canopy. Wavyleaf has ground-hugging, root-like stems, called stolons, which creep beneath leaf litter on the forest floor. These radiate from the main plant and send out roots and new shoots from their nodes. This way, a single plant forms a large colony of interconnected plants in a few years, having germinated from only one seed. Seeds germinate from April into June. Early seedlings may flower and seed their first year. Later germinating seedlings don't flower until their second year.

Positive Identification

Wavyleaf grass is a graceful-looking, low-growing plant. The leaves are .5 to 1 inch wide and 2 to 4 inches long when mature. They are deep green with elongated points and are distinctly wavy from side to side,



To identify wavyleaf, look for leaf bases that touch the stems and short, white stem hairs.



Wavyleaf has spikes of tiny white flowers that produce seeds with long purple awns.

looking like corrugated cardboard or water ripples. The leaf bases touch the stems but do not clasp or wrap around them, an important identifying characteristic. The stems are noticeably covered with short, white hairs, another important identifying characteristic. The grass is low and spreading to 6 to 8 inches high, but long-established colonies in wet sites can be 12 inches high with flower and seed stalks rising above. Stems seem to arch outward, radiating in several directions, so individual plants and colonies have a distinctive pattern. That pattern of arching, undulating leaves is easy to recognize from a distance once you know it. Spikes of white flowers with long, dark purple, pointed awns bloom beginning sometime in August, depending upon the location, and continue into October or November. Those sticky seeds are produced first at the bottom of the spikes while new flowers bloom near the top. After frost kills the top growth,

wavyleaf foliage becomes straw-colored and easy to see.

Mistaken Identity

Two invasive grasses, Japanese stiltgrass (*Microstegium vimineum*) and joint-head grass or small carpetgrass (*Arthraxon hispidus*) are sometimes mistaken for wavyleaf. Two native grasses, deertongue (*Dichanthelium clandestinum*) and broad-leaf panicgrass (*Dichanthelium latifolium*) also might



Deertongue grass.



Joint-head grass.

fool you. It is easy to tell the difference. The only one of these four that has wavy leaves is joint-head grass. Unlike wavyleaf, it is straight and upright, 4 inches to 2 feet tall and its leaf bases wrap all the way around the stems. It grows in sunny to partly shady moist to wet sites. Broad-leaf panic grass resembles a lone wavyleaf in size and shape, but its leaves are not wavy. It grows in forest settings. Deertongue is stiff and upright to 3 feet tall and is found in sun and part shade; it does not have wavy leaves and its stems are smooth and hairless. Japanese stiltgrass often grows side by side with wavyleaf. Its stems are smooth with a few hairs at the leaf bases, while wavyleaf stems are quite hairy. It is

more upright with slender lewaves that lack undulations or waviness, and have a silvery stripe on their midribs.



Broad-leaf panic grass closeup.



Japanese stiltgrass on left; wavyleaf on right.

Search and Destroy

Most known infestations of wavyleaf are on public property. The extent of the problem on private land is unknown because the invasive may go unrecognized and unreported. Forest land anywhere in Virginia is at risk. If you think you found wavyleaf, take a photo and a GPS location. Report findings to Kevin Heffernan at the Virginia Department of Conservation & Recreation. Contact: 804-786-9112 or kevin.heffernan@dcr.virginia.gov.

Do not walk through wavyleaf if it is in seed. If you inadvertently collect wavyleaf seeds on yourself or your dog, use duct tape to remove seeds from clothing and comb seeds from dog fur. Burn gathered seeds. Scrape dirt from your boots on site; double-bag dirt and put in landfill.

Manual & Mechanical: Wavyleaf can be hand-pulled if populations are small, but all bits and pieces of stolons must be removed or they will resprout. Be sure to remove tiny seedlings, which resemble miniature, mature plants. Hand-pulling is ineffective in large areas of infestation.

Foliar Spray: Use a recommended grass-specific herbicide from April through June. This won't harm wildflowers and is approved for wildlife management areas. Don't use a grass-specific herbicide in a wetland or near a stream, because it can harm fish and aquatics. One study shows grass-specific herbicides are less effective on wavyleaf in summer. After June, use a non-selective herbicide; this may also be used from April until frost. Add a surfactant if one is not already in the product. In wet areas or near streams use an aquatic-approved surfactant. Complete treatment before wavyleaf begins setting seed. If you must spray colonies that are in seed, use extreme caution; wear rubber boots and nylon clothing, which seeds are less likely to cling to. Thoroughly clean or bag boots and clothing on site. Treatment may be needed for several years due to missed plants, new seedlings, and fresh introductions. Be vigilant!

For currently approved herbicide recommendations, check the Virginia Department of Forestry chart *Non-Native Invasive Plant Species Control Treatments*, which you can download from the Blue Ridge PRISM website.