

2015

Poverty Grass

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Sandler, Hilary, "Poverty Grass" (2015). *Cranberry Station Fact Sheets*. 36.
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Poverty Grass Biology and Management

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Background

In the 1950's, Poverty grass (PG) was only an occasional weed of MA bogs. In his bulletin of the 1980's, Irving Demoranville reported that "...for reasons not fully understood, its numbers and range of its occurrence have greatly increased such that it is regularly encountered among the vines throughout southeastern MA." In recent years, we are seeing a resurgence of PG in local cranberry farms. Some attribute this increase to the use of Callisto (mesotrione), which has controlled many other weeds and thus has allowed PG to flourish; the decline in the use of Casoron (dichlobenil) and Evital (norflurazon) may also be possible contributors. PG is challenging to control and management can be difficult due to the biology of this plant; it is slow to grow and then has accelerated growth late in the season.

Life cycle and Biology

For this fact sheet, "PG" refers collectively to our two most common species, Broomsedge bluestem (BBS; *Andropogon virginicus*) and Little bluestem (LBS; *Schizachyrium scoparium*, formerly *Andropogon scoparius*). LBS is what has been traditionally identified as our "poverty grass" and has also been known as broom beardgrass. Little bluestem is often promoted as an ornamental plant and this has hastened its spread. We have also seen bushy bluestem (*A. glomeratus*) on cranberry farms.

Both species are vigorous warm-season, herbaceous perennials, densely tufted with older plants supporting new shoots from the central crown. PG spreads mainly by seeds, which require very warm soil temperatures to germinate. The tawny or bronze-colored stalks are likely to persist through the winter, the winter flood, and into the spring.

PG is slow to start its growth in the spring, and usually is not visible above the vines until mid-late June. This is true for both new shoots from older established plants and current year's seedlings. Usually PG is hard to see (unless you look carefully and closely) until after cranberry fruit are set. This growth pattern often catches growers by surprise when PG "suddenly" becomes a substantial problem in late summer. Mowing shoots as they grow rapidly in July and August provides only temporary relief. New leafy stems quickly regenerate, producing abundant seeds that are blown and scattered.

Broomsedge bluestem (BBS), a native bunch grass, is an abundant seed producer. Its fuzzy seeds are well dispersed by wind. It grows well on low-fertility soils and is shallow-rooted; it begins growth when average daytime temperatures are between 60-65°F. BBS reproduced by seed and by plant division. Little bluestem (LBS), also a native grass, was widely introduced as an ornamental plant. It is a bit shorter and has deeper roots than BBS. It produces fewer seeds and its dissemination ability is less robust than BBS.

Identifying PG. Identifying and categorizing PG can be confusing. LBS has very flat, bluish basal shoots. Plants are green, but often purplish at base of stem and the entire plant has a reddish cast after exposure to frost. Leaves are smooth, but frequently are covered with hair at the base next to the sheath. Seed head clusters are about 3" long. BBS stems are more flattened and more densely leaved than LBS. Flattened basal leaf sheaths are colorless or yellow. BBS has a straight awn and has two or more stalked seed clusters per branch. LBS has a twisted, bent awn and a single cluster of seeds per branch (see Figure 1).

Distinguishing 2 common species of Poverty Grass

TRAIT	LITTLE BLUESTEM	BROOMSEDGE BLUESTEM
Plant height	1.5-3 ft	2-5 ft
Plant habit	tufted grass	bunch grass
Plant, fall color	bronze, becoming reddish after fall frost	yellow-tan
Stem, traits	often purplish at the base	usually yellow-green
Stem, cross-section	oval	flat
Leaves, size	2-12" long, 1/8-1/4" wide	4-15" long, 1/8-1/4" wide
Leaves, traits	tend to fold at maturity; usually smooth, but can be hairy at the base next to the sheath	usually not hairy
Ligules	0.5-2.5 mm, fringed	0.2-1 mm, fringed
Flowers	single	groups of 2 or more
Awns	twisted and bent	straight

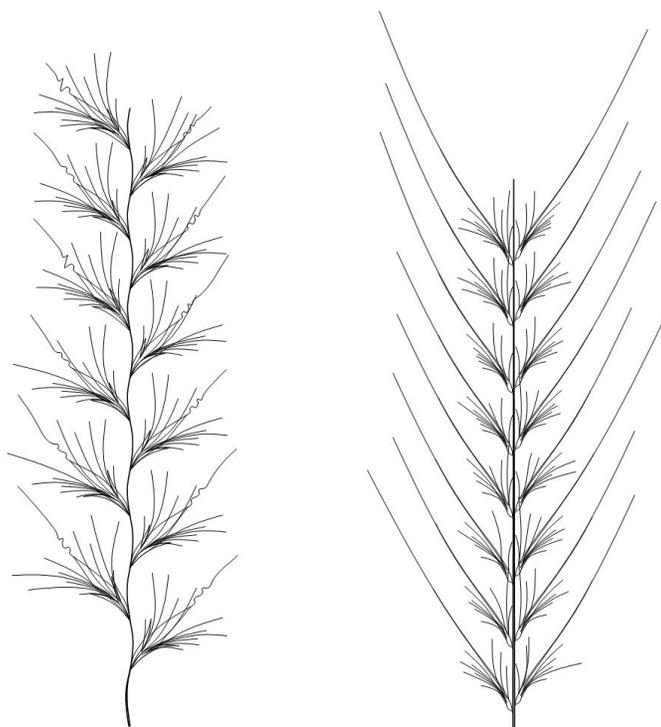


Figure 1. Bent awns of Little bluestem (left) and straight awns of Broomsedge bluestem (right). Illustrations by Bruno Chavarria.

Cultural Management

Mowing. Repeated mowing, especially in late summer and early fall to prevent seeds from becoming wind-blown and scattered is a good preventative measure. This is especially important for BBS since it produces seed in abundance. If possible, collect and remove seed heads from the bog. Mowed seed heads that appear to be tight or closed can still open up and release seeds even after being removed and discarded onto the ground.

Hand-weeding. Hand removal is very effective but is very time-consuming and may be cost-prohibitive if hired help is needed. Weeding can be effective at any time, including winter.

Flame cultivation and Flooding. We suspect that FC will NOT be effective for PG control. PG has its growing point at its base (like other grasses) and burning the top will only encourage regrowth. Likewise, we expect that flooding will not adversely affect PG since it does quite well making it through our typical winter floods. Summer floods (multi-week) will likely knock it back but your crop will be sacrificed for that year.

Chemical Control

Callisto (mesotrione). Applications of Callisto do not help manage PG and repeated applications may in fact be exacerbating the problem. Resistance to Callisto has been shown in other weeds after only 7 years of use. So, an overall good weed management practice for your farm should be to rotate away from repeated Callisto use.

Casoron (dichlobenil). Demonstration-style studies indicated some reduction in growth and vigor of existing plants with spring applications of 80 lb/A.

Devrinol (napropamide). Demoranville recommended treating heavy infestations with high-end rates of Devrinol 10G (applied by ground rig) in either the spring or fall, but with a preference for the spring application. In demonstration-style studies, we did not see really good suppression or control with early spring or fall applications of Devrinol DF-XT or 2XT (chemigated).

Evital (norflurazon). In demonstration-style plots, fall Evital at 80 lb/A suppressed existing plants but did not seem to prevent new plant growth in spring. Spring Evital at the same rate did a better job and seemed to reduce the number of new PG; however, cranberry vines may be more vulnerable to stress with spring applications. Growers reported good control when fall Evital at 60-75 lb/A was followed by winter sanding.

Roundup products (Glyphosate). Mid-summer wipes of glyphosate (10-20%) should be done before seed are present to get the best results. Post-harvest applications (0.5-1%) using a wand and spraying directly into the center of the clump injured the treated plants but did not injure surrounding dormant cranberry vines. Since glyphosate (e.g., Roundup) will kill any green plant, you must be very careful when wiping or spraying PG. If infestations are widespread, hand-wiping will be too labor-intensive and a machine wiper should be used. We have not tested generic glyphosate products.

Poast (sethoxydim) / Select and Intensity (clethodim). Any grass herbicide applied mid-late July via backpack sprayer at 30 GPA reduced growth and seed production compared to untreated plots in a replicated field trial. In our demonstration-style trials, Poast sprayed directly into clumps in the fall injured plants but did not reduce seed production. Growers have tried late spring, pre-bloom (cranberry) applications of Select by air with good results.

Management At-a-Glance

TREATMENT	SPRING	SUMMER	FALL
Casoron	◆	NR	unk
Devrinol	◆	NR	NR
Evital	◆◆	NR	◆
Glyphosate	NR	◆◆	◆
Poast	unk	◆◆◆	◆
Select	◆◆ (by air)	◆◆◆	unk
Intensity	unk	◆◆◆	unk
Mowing	NR	◆	NR
Handweeding	◆◆	◆◆	◆◆
Flaming	NR	NR	NR
Flooding	NR	◆◆ (lose crop)	NR

- ◆ = some reduction in growth or vigor
- ◆◆ = injures existing plants; new plants, seed production may be reduced
- ◆◆◆ = reduces both weed biomass and seed production
- NR = not recommended
- unk = effectiveness is unknown

References

Demoranville, I.E. 1984. Weeds of Massachusetts cranberry bogs, Part 1. East Wareham, MA. University of MA. 22 p.

Little bluestem USDA fact sheet: http://plants.usda.gov/factsheet/pdf/fs_scsc.pdf.

Broomsedge USDA fact sheet: http://plants.usda.gov/plantguide/pdf/pg_anvi2.pdf.

This work was supported in part by funding provided by USDA-NIFA Extension Implementation Program, Award No. 2014-70006-22579