

SUPPRESSION OF JAPANESE STILTGRASS AND ARTHRAXON AND NON-TARGET RESPONSE USING PRE HERBICIDES. A.E. Gover, Penn State Univ., Univ. Park.

ABSTRACT

Pendimethalin is the current preferred herbicide for selective PRE suppression of Japanese stiltgrass (*Microstegium vimineum* (Trin.) A. Camus var. *imberbe* (Nees) Honda) in park and natural areas due to efficacy, minimal impact to established non-target species, and history of use and manufacturer technical support. Pendimethalin is not effective when seed germination has occurred, and is not labeled for use in wetland settings. The impending introduction of flumioxazin and bispyribac-sodium with aquatic labels and increasing infestation of stiltgrass and jointhead arthraxon (*Arthraxon hispidus* (Thunb.) Makino) in a seasonally wet meadow at Waterloo Mills Preserve in Devon, PA provided a setting to test pendimethalin and other herbicides against a new, C₄ annual grass target. A second site at French Creek State Park, Elverson, PA was also used because it featured mile-a-minute (*Polygonum perfoliatum* L.) in addition to stiltgrass. The applications were delayed to test the utility of adding low rates of imazapic to strictly preemergent herbicides to determine if the application window could be extended while maintaining selectivity. The April 1, 2010 treatments at Devon included pendimethalin at 2.1 kg/ha, and 4.3 kg/ha alone and in combination with imazapic at 0.018 kg/ha, proflamifen at 0.82 and 1.6 kg/ha, flumioxazin at 0.29 and 0.43 kg/ha, imazapic at 0.035 and 0.070 kg/ha, and bispyribac-sodium at 0.056 and 0.11 kg/ha. The Elverson treatments were applied April 9, 2010 and included pendimethalin at 4.5 kg/ha alone, and in combination with imazapic at 0.018 or 0.035 kg/ha, proflamifen at 1.6 kg/ha alone or with 0.018 kg/ha imazapic, oryzalin at 4.5 kg/ha alone or with 0.018 kg/ha imazapic, and flumioxazin at 0.29 or 0.43 kg/ha.

When rated August 27, 2010, vegetative cover at Devon averaged 87 percent, and stiltgrass cover averaged 32 percent in the control plots. Pendimethalin plus imazapic, proflamifen plus imazapic, and flumioxazin-treated plots averaged 1 percent or less stiltgrass cover. Arthraxon density was sporadic, and averaged only 2 percent in the control, with a maximum of 13 and 15 percent in the bispyribac-sodium-treated plots. There was no arthraxon observed in plots treated with pendimethalin, alone or with imazapic, and flumioxazin. Prominent non-target species at Devon included several goldenrods (*Solidago* spp.), crabapple (*Malus* spp.), soft rush (*Juncus effusus* L.), and mountain mint (*Pycnanthemum virginianum* (L.) Duran & Jacks. ex B.L. Rob. & Fernald). Flumioxazin caused transient contact injury to all emerged species that was obscured by new growth by 33 DAT. Imazapic caused significant injury to soft rush, even at the 0.018 kg/ha rate, and the higher rates injured the undesirable reed canarygrass (*Phalaris arundinacea* L.) as well. At Elverson, except for short-term flumioxazin burn, significant injury was not observed on prominent non-target species, which included goldenrods, deertongue (*Dicanthelium clandestinum* (L.) Gould), briars (*Rubus* spp.), grapes (*Vitis* spp.), and poison ivy (*Toxicodendron radicans* (L.) Kuntze). Total vegetative and stiltgrass cover averaged 98 and 70 percent in the control plots August 27, 2010. All herbicide treatments reduced stiltgrass cover to 20 percent or less, with pendimethalin plus imazapic, flumioxazin, and oryzalin plus imazapic-treated plots averaging 5 percent or less stiltgrass cover. Mile-a-minute seedlings were present at low densities in all plots at 0 DAT, but observed only in the controls on August 27.