ESTABLISHMENT OF SWITCHGRASS FOR BIOFUEL PRODUCTION IN WISCONSIN. Mark Renz, Assistant Professor, University of Wisconsin, Madison, WI 53706.

Establishment of switchgrass can be reduced by weeds, but few studies have evaluated the effectiveness of herbicide treatments applied pre (PRE) or post-emergent (POST) in improving switchgrass establishment and productivity. Two experiments were established at Marshfield, Wisconsin to evaluate the benefit of PRE or POST herbicide applications as randomized complete block design with three replications. PRE herbicide treatments consisted of imazethapyr (35 and 70 g ae ha^{-1}), imazamox (17.5 and 35 g ae ha^{-1}), imazapic (70 g ae ha^{-1}) + glyphosate (140 g ae ha^{-1}), quinclorac (420 and 840 g ai ha^{-1}), dithiopyr (280 and 560 g ae ha^{-1}), sulfosulfuron (840 and 1680 g ai ha^{-1}), glyphosate (840 g ae ha^{-1}), and an untreated control. POST treatments were applied when switchgrass had 2-3 true leaves and included both rates of imazethapyr, imazamox, sulfosulfuron, and quinclorac as the PRE experiment as well as imazapic (70 g ha^{-1}), 2,4-D (1064 g ae ha^{-1}), dicamba (280 g ae ha^{-1}) + 2,4-D (785 g ae ha^{-1}), metsulfuron (4.2 g ai ha^{-1}), and an untreated control. Adjuvant was added to all POST treatments based on manufacturer recommendations for each herbicide. Percent cover of switchgrass and grass (primarily *Setaria* and *Digitaria* spp.) and broadleaf weeds (primarily *Chenopodium album* and *Amaranthus* spp.) were estimated in July and September during the establishment year and above ground dry biomass was estimated within plots in the establishment and two subsequent years.

In the PRE trial, broadleaf weed cover was reduced compared to untreated plots by all treatments except quinclorac and glyphosate 50 days after treatment (DAT), but only 2,4-D, metsulfuron, 2,4-D + dicamba, imazamox at 17.5 g ha^{-1}, and sulfosulfuron at 840 g ha^{-1} reduced broadleaf cover by the same date (20 DAT) in the POST trial. Low grass weed populations in the field resulted in no treatments with less cover than untreated plots in either trial. Although stunting of switchgrass was observed in treatments with imazethapyr, imazamox, imazapic, dithiopyr, sulfosulfuron, and metsulfuron, by September only PRE dithiopyr treatments had less switchgrass cover than untreated plots in either trial. Switchgrass cover in September of the establishment year was increased two to three fold with PRE treatments of imazethapyr, imazamox, imazapic + glyphosate, and sulfosulfuron at 840 g ha^{-1} and POST treatments of 2,4-D, metsulfuron, 2,4-D + dicamba, and dithiopyr compared to untreated plots. Dry biomass of switchgrass in the establishment year was increased two to fourfold with imazapic and imazamox at 35 g ha^{-1} treated PRE and 2,4-D and 2,4-D+dicamba treated POST compared to untreated plots which yielded 0.5 and 0.7 Mg ha^{-1} in PRE and POST trials respectively. The year following establishment biomass was greater than untreated plots in PRE treatments of imazamox, imazethapyr, glyphosate + imazapic, and sulfosulfuron at 840 g ha^{-1} and the POST treatments of metsulfuron, 2,4-D, and 2,4-D+dicamba. These treatments doubled aboveground biomass compared to untreated plots which yielded 5.0 and 4.5 Mg ha^{-1} in PRE and POST trials respectively. Two years after establishment, only glyphosate + imazapic and metsulfuron continued to show greater biomass than untreated plots with yields of 10.3 and 8.8 Mg ha^{-1} respectively. Results suggest that weed management during establishment can improve cover and productivity in the establishment and two subsequent years.