

Glyphosate-resistant horseweed proves to be a challenge for many Michigan sugarbeet growers. Integrating multiple management strategies, including a cereal cover crop, may improve horseweed control. In 2019 and 2020 field studies were conducted in East Lansing, Michigan to evaluate the effects of fall-planted cereal rye termination time and method in combination with different postemergence (POST) herbicide treatments for horseweed control. Cereal rye was drilled at 67 kg ha⁻¹ in the fall of 2019 and 2020. The studies were conducted as a split-plot design with cereal rye termination method and time as the main plot factors and herbicide treatments as the sub-plot factor. Cereal rye treatments included: early burndown (EBD) 14 d prior to sugarbeet planting, burndown at planting (PBD), PBD + roller, and PBD + roller crimper, a delayed burndown (DBD) 14 d after planting, and a no cover control, the addition of no-cover strip-till and delayed burndown strip-till were treatments added to the 2020 study. The burndown treatment consisted of glyphosate applied at 1.27 kg ae ha⁻¹ + ammonium sulfate. The three herbicide treatments consisted of two POST applications at the 2- and 6-8 leaf sugarbeet stage. The treatments included: 1) glyphosate twice (control), 2) glyphosate (0.84 kg ae ha⁻¹) followed by glyphosate (0.84 kg ae ha⁻¹) + clopyralid (0.11 kg ha⁻¹), and 3) glyphosate (0.84 kg ae ha⁻¹) + clopyralid (0.06 kg ha⁻¹) followed by glyphosate (0.84 kg ae ha⁻¹) + clopyralid (0.11 kg ha⁻¹). In 2019, cereal rye biomass at the time of termination was 640 and 740 kg ha⁻¹ for the EBD and PBD terminations, respectively. Cereal rye biomass at the time of the 'Planting Green' termination was 5-times higher (4,200 kg ha⁻¹). Horseweed biomass 14 d after planting (DAP) was 11 times lower where a cover crop was planted compared with the no cover control, regardless of termination time or method. 'Planting Green' with an application of clopyralid applied either once or twice reduced horseweed biomass up to 99%. At harvest, the main effect of the cereal rye cover crop reduced horseweed biomass up to 75%. The main effect herbicide treatments showed a greater reduction in horseweed biomass with two application of clopyralid followed by clopyralid one application, followed by the control. Even though horseweed biomass was lowest in the DBD treatment, sugarbeet yield was reduced and was not different compared with the no cover control, due to reduced sugarbeet growth in the DBD. Sugarbeet yield for the EBD, roller crimper, and roller were all similar and the PBD showed the highest overall sugarbeet yield and was not different than the roller treatment. Regardless of clopyralid treatment, sugarbeet yields were the same. Data for the 2020 season is currently being analyzed. However, it appears that integrating cereal rye into a sugarbeet system could be an important tool for horseweed management. This research will be repeated in 2021.