

THORSNESS, KEVIN B., DEAN MARUSKA, JIM STEWART, KEVIN STASKA, and PAUL MAYLAND, AgrEvo USA Company, Wilmington, DE 19808. Liberty Herbicide for Weed Control in Transgenic Sugar Beet.

Weed control is an important aspect of sugar beet production. The current herbicides labeled for use in sugar beet are limited by their weed spectrum and in some cases weed size at application. Liberty Herbicide is a non-selective postemergence herbicide with no soil residual and is being developed by AgrEvo USA Company for use on transgenic sugar beet (Liberty Link Sugar Beet). Liberty Link Sugar Beet have been genetically altered by insertion of the phosphinothricin-acetyltransferase (pat) gene and are tolerant to Liberty Herbicide. The pat gene encodes for an enzyme that detoxifies Liberty Herbicide in the Liberty Link Sugar Beet plant. Field experiments were conducted in 1995-1996 at various locations to evaluate weed efficacy and tolerance of Liberty Link Sugar Beet to Liberty Herbicide applications. Liberty Herbicide at 14-34 oz/a was applied to 1, 3, and 5" weeds and applications were repeated 2 more times when newly germinated weeds reached the original size. Weed species present in the trials were redroot pigweed, common lambsquarters, kochia, wild oat, green foxtail, and barnyardgrass. The plots were not cultivated or hand weeded. Weed control with Liberty Herbicide was better when applied to 1" weeds compared to 3 or 5" weeds. Liberty Herbicide at 14 and 17 oz/a gave 85 and 90% overall control of 1" weeds, respectively. However, Liberty Herbicide at 21-34 oz/a gave greater than 95% overall control of 1" weeds. Liberty Herbicide applications to Liberty Link Sugar Beet did not cause any visible injury. Liberty Herbicide will provide sugar beet growers with a tool to produce sugar beet without hand labor and with less or no cultivation.