THORSNESS, KEVIN B., THOMAS W. KLEVEN, CHARLES P. HICKS, AND D. PATRICK DWYER, AgrEvo USA Company, Wilmington, DE 19808. **Use of Liberty in Transgenic Sugar Beet.**

Weed control is a critical aspect of sugar beet production. Herbicides that are labeled for use in sugar beet are limited by their weed spectrum and/or the window of 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 (LibertyLink® sugar beet). LibertyLink® 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 LibertyLink® sugar beet plant. Field experiments were conducted in 1996-1998 at various locations to evaluate weed efficacy, band applications, cultivation influence, and tolerance of LibertyLink® sugar beet to Liberty® Herbicide applications. Liberty® Herbicide at 14-28 oz/a was broadcast applied to 1 and 3" weeds and applications were repeated 1-2 more times when newly germinated weeds reached the original application stage. Weeds present in the trials were redroot pigweed, common lambsquarters, kochia, hairy nightshade, wild buckwheat, common purselane, wild oat, green and yellow foxtail, and barnyardgrass. The plots were not hand-weeded. Weed control with Liberty® Herbicide was better when applied to 1" weeds compared to 3" weeds. Liberty® Herbicide at 14 and 28 oz/a gave 82 and 97% overall control of 1" weeds, respectively. Liberty® Herbicide applied in a 7-11" band provided similar weed control to broadcast applications. Liberty® Herbicide applied 2 times and alternated with 2 cultivation passes gave similar weed control to Liberty® Herbicide applied 3 times without cultivation. Liberty® Herbicide applications to LibertyLink® sugar beet from emergence to the 10-leaf stage of growth did not cause visible injury. Liberty® Herbicide will provide sugar beet growers with a tool to produce sugar beet with less hand labor and cultivation.