Hein, Gary L.*, and Robert G. Wilson, University of Nebraska Panhandle Res. & Ext. Center, 4502 Ave. I, Scottsbluff, NE 69361. Influence of timing and placement on phytotoxicity of insecticides and herbicides on sugarbeets.

ABSTRACT In western Nebraska, significant stand losses have resulted from the use of planting-time insecticides applied alone and in combination with pre-plant herbicides. The influence of different placements of planting-time insecticides was evaluated in two separate studies each conducted for two years. The first study evaluated the effect of five different placements of granular insecticides at planting and one post-emergence liquid application at the cotyledon stage. All treatments were included within the main plot treatments of cycloate (2.8 kg/ha) treated and untreated plots. The placements included modified in-furrow, band (12.7 cm) in front of the press wheel, band behind the press wheel, band in front of the planter unit, and band in front of the planter unit with incorporation. Chlorpyrifos was applied at 2.2 and 4.5 kg/ha in all placements. All treatments were incorporated with straight drag chains. All treatments were compared to an untreated check, and the percent reduction in stand and yield parameters were evaluated.

The main plot effect of herbicide significantly reduced stand in one of two years. Significant placement effects were found in each of the two years of the study for stand and total sugar reduction. The post-applied insecticide had significantly higher stand and increased sugar yield than the planting-time treatments. The placements in front of the press wheel (band and modified in-furrow) resulted in the greatest stand reduction and lowest sugar yields in both years. The planting-time treatment that provided the most consistent phytotoxicity protection was the placement to the rear of the press wheel.

A second study was done using a factorial treatment arrangement of four granular insecticides, two insecticide rates and three planting-time placements. The four insecticides were aldicarb (15G), fonofos (20G), and two formulations of terbufos (15G and 20CR). The two rates used were the maximum registered rate for sugarbeet root maggot and twice this rate. The three placements included 12.7 cm bands in front and behind the planter unit and in front of the press wheel. All treatments were incorporated with straight drag chains.

Significant main effects of chemicals and rates were seen, with results similar to previous studies. The effect of placement was significant in both years, with the placement behind the press wheel providing the greatest protection from phytotoxicity in both years. the results from both studies in both years indicate that the safest placement for planting time insecticides is to apply these chemicals in a band behind the press wheel, thus insuring maximum separation between the seed and the insecticide.