Correlation Between Soil Type and Rates of Sodium TCA and 3-Chlorb IPC Application for Pre-emergence Grass Control

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When field results with 3-Chloro IPC and Sodium TCA were being tabulated at the close of the 1951 growing season, certain inconsistencies appeared.

Identical rates of application under identical temperature and moisture conditions produced totally different results in several localities. In the Greeley area, for instance, 3-Chloro IPC at one and one-half pounds per acre gave 30-50 percent control of grass weeds, while the same rate at Fort Collins gave no results whatever. TCA injured onions severely at 10 pounds per acre at Greeley, but removed grasses effectively from onions at Fort Collins without apparent injury to the crop.

An analysis of the conditions present in the various testing areas revealed one variable, the soil type. In order to test the validity of this finding, three widely divergent agricultural soil types common to northern Colorado were selected and placed in deep flats. These soils, Valentine fine loamy sand, Fort Collins loam, and Terry silty clay loam were planted to field depths with sugar beets, onions, sweet clover and alfalfa, wild oats, millet, barley, and crested wheatgrass. Three-Chloro IPC at 3, 6, 9, and 12 pounds per acre, and Sodium TCA at 5, 10, and 15 pounds were compared against untreated checks in each soil type.

Results show conclusively that the selective effect against grasses of either chemical per unit weight is far less on the sand and clay than on the productive, highly organic loam. The lowest rates of TCA and C-IPC injured all crops on the sandy soil, and all but the lowest rate injured crops on the clay, whereas sugar beets were uninjured *in* the loam at 15 pounds per acre of TCA. Barley did not appear in any of the flats containing the sandy soil, but germinated and grew normally at six and nine pounds per acre of C-IPC on loam. The other crops and grasses responded similarly.

This comparison under controlled conditions closely paralleled the field results obtained earlier, and indicates a high degree of necessity in properly gauging field rates of application with the varying soil types encountered.

To date it appears that organic matter and structure are probably more of a factor than is texture. This is brought out by the similar lack of resistance to the action of the chemicals by both sand and clay. The medium-textured loam, with high organic content and friable structure, probably adsorbs the chemicals to a high degree and prevents effective usage of a large percent of the total amount applied. Differences in residual effects on these various soil types will also be studied, in an attempt to arrive at a usable index for determining rates of application of pre-emergence grass herbicides.

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