

For Improved Spray Drift Control

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WEED and brush control has long been a problem for the people in Kansas. The first chemical used on weeds in Kansas was salt-applied at one pound per square foot. This removed all vegetation, but topsoil was blown away or eroded.

With the discovery of 2,4-D and 2,4-5T, a new era of weed control started. When properly applied, these chemicals killed broad leafed weeds but did not harm the grasses. We could spray our roadsides and kill the weeds and brush and not our grass.

But for the past few years, drift of these 2,4-D sprays has been a problem. You can spot damage on many susceptible plants. For this reason, when I saw a representative of Hercules Incorporated demonstrate an invert sprayer at our State Weed Meeting, I was very interested. Arrangements were made for a demonstration on our roads under typical windy conditions.

Subsequently, on May 11, 1967, three different types of herbicide sprays and techniques were demonstrated in Shawnee County.

- (a) One was Visko-Rhap invert herbicide emulsion using a sprayer manufactured by Minnesota Wanner Company . . . the water and herbicide are forced into a thick viscous emulsion that forms droplets too heavy to drift under normal spraying conditions.
- (b) A standard thickening agent was added to the herbicide used in the Shawnee County sprayer . . . to reduce drift.

- (c) Water alone was employed in the Kansas Noxious Weeds Division sprayer—to demonstrate the difference in drift between conventional sprays and those with a thickening agent added.

These three spray systems were demonstrated just east of U.S. 75 on a Shawnee County road leading to Richland. The sprays used appeared to have an effective kill of elm, wildrose, cottonwood, and weeds, but the grass was not killed.

Test for drift of the spray was made using tomatoes in the right-of-way fence line and at 2 feet, 4 feet, and 6 feet beyond the fence line on the downwind side with 30 mph wind gusts. The area from the pavement edge to near the fence line was first sprayed with invert emulsion. None of the 4 plants used in this test have shown any signs of wilting or stunted growth. All 4 plants with 80 days of growth after spraying are healthy and produced small green tomatoes.

The second spraying of the section was made with a thickened herbicide solution. Tomato plants were placed at two-foot intervals beyond the fence at increments of 0, 2, 4, 6, 8, and 10 feet. Within 24 hours the plant under the fence and the plant 2 feet beyond the fence were wilting badly. Plants at 4 feet and 6 feet were in the first stages of wilt within 24 hours and the plants at 8 and 10 feet showed no signs of wilting. After 5 days, the plants at 6 feet began recovering, while the 0, 2, and 4 foot plants were badly wilted with yellow leaves. After

8 days, the plants were removed from the laboratory and planted outdoors. At this time, the 0, 2, 4, and 6 foot plants showed signs of wilting, although the 2 foot and 6 foot plants seemed to be recovering. Seven days later, or 16 days after spraying the plant under the fence died. At the end of 80 days after spraying, the plant under the fence was dead, the 2 foot and 4 foot plants were stunted and will die without producing tomatoes, and the 6, 8, and 10 foot plants are healthy and have produced small green tomatoes.

Spraying with water, without use of thickener or invert emulsion was demonstrated. Spray fog could be observed drifting with the wind for a distance of 30 feet or more, beyond the fence line.

Soon after our roadside demonstration, with the help of Hercules personnel, we converted our hydraulic boom-controlled roadside sprayer. This was a simple operation. We added the mechanical mixer and used a 55-gallon, 2,4-D barrel.

Our sprayer is equipped so we can spray conventional thickener, or invert. However, after the first day of invert spraying, we were satisfied with the drift control and finished our roadside spraying (300 miles on both sides) with invert material.

With good drift control, our crew sprayed on days we wouldn't have thought about spraying with conventional 2,4-D formulation. This enables us to do more roadside spraying during the period that weeds are small and easily killed. The invert material resists wash-off.