

SIMULATED HERBICIDE CARRYOVER TO RUSSET BURBANK POTATOES

by
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Five herbicides were applied to a sandy soil on March 26, 1991, prior to planting Russet Burbank potatoes on April 9, 1991. Herbicides were applied at 1/3, 1/9, and 1/27 of the maximum labeled rates used in small grains or alfalfa to simulate herbicide carryover to potatoes.

Soil samples were taken to a depth of 12 inches at potato planting and bioassays were developed to determine herbicide levels in the soil. Lentils were effective in determining chlorsulfuron and imazamethabanz levels, sunflowers in determining imazethapyr and clopyralid levels, and snapbeans in determining dicamba levels in the soil.

Chlorsulfuron at the rates tested injured potatoes more than the other herbicides. Potato growth was severely stunted early in the growing season, roots were stubby and numerous, and tubers had many roots in chlorsulfuron-treated soil. At harvest, tubers were small, many were knobby, dumbbell shaped, and a small percentage had growth cracks. Chlorsulfuron reduced the total yield and the yield of U.S. No. 1's, and increased the yield of U.S. No. 2's and culls at all rates tested. Tubers specific gravity was also reduced.

Imazethapyr at the 1/3 and 1/9 use rates caused similar symptoms to potatoes as chlorsulfuron, but did not injure potatoes at the 1/27 use rates. More growth cracks were present on tubers from imazethapyr-treated plots than from chlorsulfuron-treated plots. Imazethapyr at 1/3 and 1/9 use rates reduced the yield of U.S. #1's and increased the yield of U.S. #2's and culls. Total yield was also reduced.

Imazamethabenz at the 1/3 use rate caused chlorosis, stunting, and boat-or lance-shaped leaves. Many tubers were dumbbell shaped, knobby, and some had growth cracks. Only the 1/3 use rate lowered total tuber yield and the yield of U.S. #1's.

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Clopyralid and dicamba injury symptoms were similar on potatoes. Potato foliage had leaf cupping, epinastic, twisted growth, fan shaped leaves, and fiddle necking. Clopyralid symptoms worsened in June and July, whereas dicamba symptoms were no longer evident at that time, indicating that clopyralid was probably more persistent and was being taken up from the soil later in the season. Clopyralid slightly lowered the total yield and yield of U.S. #1's. Dicamba at the 1/3 use rate slightly lowered total yield and yield of U.S. #1's. Neither herbicide had much effect on yield of U.S. #2's and culls.

Tubers from all of these treatments are in storage and will be planted in 1992 at Othello to determine if the herbicides carry over in the seed. The trial will be repeated in 1992.