



The soil adsorption, mobility, degradation, and residual properties of AC 222,293  
by Gary Milton Fellows

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in  
Agronomy  
Montana State University  
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**Abstract:**

AC 222,293 (m-Toluic acid, 6-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-, methyl ester and p-Toluic acid, 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-, methyl ester) was applied preplant incorporated at rates of 0.1, 0.2, 0.4, 0.8, and 1.4 kg/ha to field plots at Havre, Bozeman, and Kalispell, Montana in the spring of 1985.

Twelve crops were planted into the plots in 1985 and eleven in 1986. Lentils, yellow mustard, oats, rape, and sugar beet were injured by soil residues of AC 222,293. Crop injury varied by site. Soil pH was the most highly correlated soil factor with crop injury. Injury increased as the soil pH decreased.

The soil mobility of AC 222,293 was measured by soil thin-layer chromatography. AC 222,293 had an average R<sub>f</sub> value of 0.53 in eight soils. The herbicide moved as a dispersed band through the soil. Soil adsorption of AC 222,293 is low, with an average Freundlich K value of 1.79 on nine soils. Adsorption of AC 222,293 was positively correlated with soil organic matter.

The degradation of AC 222,293 under controlled conditions varied by soil type. Degradation was greater in soil treated with 2 ppm than 1 ppm AC 222,293. Degradation was greater when the treated soil was stored at 18.5 C than at 4.5 C. Microbial degradation is suggested as a major factor in the degradation of AC 222,293.

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Bozeman, Montana

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## ABSTRACT

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