

Evidence For Weed Suppression Due To Intercepted Paraquat On A Rye (*Secale cereale*) Straw Mulch

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Abstract

Greenhouse experiments were conducted in 1987 and 1988 to test the hypothesis that intercepted paraquat in a paraquat-killed rye cover crop is responsible for some of the weed suppression observed in no-tillage field experiments. Field-grown rye, either paraquat-killed (0.5 lb/A) or mowed (air-dried), was placed on top of pots at a level comparable to 4,000 lb/A (100% coverage). Pots were either watered from above or below the straw. The survival rate of redroot pigweed (*A. retroflexus* L.) seedlings was used to measure the

effects of a factorial set of treatments (2-straw types X 2-watering methods). A significant statistical interaction was found in both years between straw type and watering method. In both years the paraquat-killed rye straw and above-watering method treatment combination significantly reduced pigweed seedling survival compared to all other treatments, indicating that the intercepted paraquat was moving off the straw and killing seedlings. Rainfall of 1.0 in. and 1.5 in., in 1987 and 1988, respectively, on paraquat-killed rye prior to collection for greenhouse experiments did not diminish the phytotoxic effect of the straw. These results suggest that intercepted paraquat on straw may be responsible for some of the weed suppression attributed to paraquat-killed cover crops.

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