MINNESOTA - Alfalfa in Rotation Strategies to Manage Herbicide-Resistant Giant Ragweed

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Herbicide-resistant weeds like giant ragweed (*Ambrosia trifida*) are becoming obstacles to weed control and profitable yields in grain crops. The research objective was to determine how crop rotations (Corn-Corn-Corn, Soybean-Corn-Corn, Soybean-Wheat-Corn, Soybean-Alfalfa-Corn, Alfalfa-Alfalfa-Corn) affect emergence patterns and populations of glyphosate- and ALS- resistant giant ragweed. Results from 2013 growing season showed alfalfa and wheat, which have early season establishment and growth, have fewer giant ragweed seedlings than later-planted crops. Cumulative giant ragweed emergence in established (year 2) alfalfa was 2 plants/ft^2, in seeding year alfalfa following soybean was 4 plants/ft^2, in wheat following soybean was 4.2 plants/ft^2, in soybean following corn was 6 plants/ft^2, in corn following corn was 6.5 plants/ft^2, and in corn following soybean was 11.4 plants/ft^2. The lower level of giant ragweed emergence in alfalfa and wheat may be due to an increase in early season competition in addition to soil conditions less-conducive to emergence. In terms of the temporal emergence pattern of the giant ragweed in each crop, the giant ragweed seedlings emerged earliest in alfalfa and wheat, whereas emergence in corn and soybean occurred slightly later. Multiple harvests of alfalfa reduced ragweed growth and seed production. Results suggest diversified crop rotations containing alfalfa have a large effect on giant ragweed emergence patterns and could be used in controlling herbicide-resistant giant ragweed by directly affecting the weed seed-bank.