CANADA THISTLE CONTROL IN A POTATO AND SPRING WHEAT ROTATION. Sudeep A. Mathew and Harlene H. Valenti, Graduate Research Assistant and Assistant Professor, North Dakota State University, Fargo, ND 58105.

Field experiments were conducted to identify the effects of low temperatures associated with herbicide treatment on Canada thistle control in a potato and spring wheat rotation. Fields were selected with a natural infestation of Canada thistle at North Dakota State University's agricultural research farm in Fargo. Treatments were arranged in a randomized complete block design with herbicide and application timing as treatments and five replicates. Glyphosate and dicamba plus diflufenzopyr were applied to Canada thistle after harvest regrowth following at three different temperature regimes. Plant densities following potato harvest were much lower when herbicides were applied compared to the wheat field due to harvest operations and physiological characteristics of regrowth. These low initial plant densities in the potato field resulted in increased Canada thistle populations 1 yr after treatment. The smallest Canada thistle increase of 11 plants/m^2 occurred 1 yr after glyphosate at 3.1 kg ae/ha was applied and compared to an average increase of 50 plants/m^2 in untreated plots. Freezing temperatures prior to herbicide application did not influence Canada thistle control. In the spring wheat field, dicamba plus diflufenzopyr at 350 plus 140 g ae/ha applied prior to a freeze eliminated all Canada thistle. A single freeze did not affect Canada thistle control 1 yr after herbicide treatment with an average plant reduction of 88% when treated prior to a freeze and 87% when herbicides were applied after a freeze. However, Canada thistle control 1 yr after treatment with herbicides applied following multiple freezes averaged 62% across treatments.

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