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Diflufenzopyr increases perennial weed control with auxin herbicides

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Abstract:

Diflufenzopyr is an auxin transport inhibitor (ATI) which interferes with the transport of naturally occurring auxin and synthetic auxin-like herbicides in plants. Diflufenzopyr blocks the polar transport of these compounds and disrupts the auxin balance needed for plant growth. Previous research at North Dakota State University has shown perennial weed control was increased by the addition of diflufenzopyr to dicamba and other auxin herbicides. The purpose of this research was to evaluate diflufenzopyr at various rates applied with auxin herbicides for leafy spurge, spotted knapweed, and Canada thistle control. Herbicides evaluated included dicamba, picloram, 2,4-D, picloram plus 2,4-D, quinclorac, clopyralid, clopyralid plus 2,4-D, and imazapic.

In the first study, herbicides were applied at the normal use rate for season-long leafy spurge control to determine if the addition of diflufenzopyr increased leafy spurge control compared to the herbicides alone. Herbicides were applied in the fall prior to a killing frost. Leafy spurge control with picloram was increased by 2-fold 24 MAT (months after treatment) when the herbicides were applied with diflufenzopyr compared to the herbicides alone.

The second experiment evaluated the importance of the diflufenzopyr ratio (herbicide:ATI) applied with various herbicides for leafy spurge and Canada thistle control. Leafy spurge and Canada thistle control 12 to 15 MAT was greater when herbicides were applied with diflufenzopyr compared to alone, regardless of the diflufenzopyr rate. For example, leafy spurge control increased from 38 to 92% with picloram plus 2,4-D when diflufenzopyr was added compared to picloram plus 2,4-D applied alone. Canada thistle control increased from 13 to 42% with clopyralid plus 2,4-D when diflufenzopyr was added compared to clopyralid plus 2,4-D alone. Spotted knapweed control was similar whether or not diflufenzopyr was applied regardless of the herbicide evaluated.

In summary, leafy spurge control was increased when diflufenzopyr was applied with auxin herbicides. Canada thistle control with clopyralid was improved when the herbicide was applied with diflufenzopyr. Diflufenzopyr could be used to increase long-term perennial weed control with herbicides or allow the use of reduced herbicide rates without subsequent loss in weed control.