Technology Development by MONSANTO ®

ROUNDUP READY PLUS™ WEED MANAGEMENT SOLUTIONS

Tank-mixing Glyphosate and Micronutrients

There is interest in tank-mixing foliar micronutrient fertilizers with glyphosate (the active ingredient in Roundup® brand agricultural herbicides) to save time and application costs. However, this practice is not recommended because it can result in reduced weed control.

Micronutrient Foliar Sprays

Foliar sprays of micronutrients are used in crops, such as foliar manganese (Mn) fertilizer in soybeans. Other micronutrients that may be applied in foliar sprays include boron (B), copper (Cu), iron (Fe), molybdenum (Mo), and zinc (Zn), which are positively (+) charged cations when dissolved in water. Since many foliar sprays are applied around the time of glyphosate treatments in Roundup Ready® crops, there is interest in tank-mixing glyphosate and micronutrients.

Antagonism with Glyphosate

Glyphosate can bind to micronutrients in the spray solution. This can cause glyphosate to become inactive and simultaneously convert the micronutrient into a form less useable by the crop. Glyphosate is negatively (-) charged when dissolved in water and can be tied up by positively (+) charged micronutrient cations. Weed control may be affected because the glyphosate micronutrient complex can reduce the absorption and translocation of the herbicide in the plant.

Some of this antagonism can be reduced by adding ammonium sulfate (AMS) to the spray solution before adding glyphosate. However, the antagonism will not be completely overcome by adding AMS or other additives to the spray solution. Some micronutrient formulations, such as those containing EDTA, can be less antagonistic with glyphosate, but again not completely.

Tank-mixing micronutrients with glyphosate may reduce weed control because of antagonistic cations in the spray solution.

Recommendation

It is not recommended to tank mix glyphosate herbicides with micronutrients or foliar fertilizers. It is also best to separate applications of a foliar micronutrient and glyphosate herbicide by more than a week. This helps to allow for maximum uptake and translocation of glyphosate by weeds and foliar fertilizer by the crop.

Source: Bernards, M.L., K.D. Thelen, D. Penner, R.B. Muthukumarin, and J.L. McCracken. 2005. Glyphosate interaction with manganese in tank mixtures and its effect on glyphosate absorption and translocation. Weed Science. 53:787-794.

Roundup WEATHERMAX® Herbicide

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