Is a PRE applied POST as good as a PRE applied PRE?

Monsanto has introduced a new product, Warrant, for postemergence (POST) applications in soybean. Warrant is unique in that it is only labeled for POST applications even though it has no foliar activity. Warrant contains an encapsulated form of acetochlor, the active ingredient in Harness. The encapsulation is designed to eliminate the crop injury that occurs with POST applications of acetochlor on soybean. Warrant is intended to control weeds that emerge after the POST application, including grasses and small-seeded broadleaves. Warrant typically will be tank-mixed with glyphosate in order to control weeds that emerge prior to the POST application.

There is no doubt that using Warrant can improve weed control in soybean, but will it help manage glyphosate resistance (GR) when tank-mixed with glyphosate? In order for alternative mechanisms of action (MOA) to reduce selection pressure from glyphosate, the herbicide must control a significant percentage of the weed population. The higher the percentage of weeds controlled by the alternative MOA, the fewer weeds controlled by glyphosate and the lower the risk of selecting GR weeds. With Warrant, the resistance management benefit will vary depending on application timing and the emergence pattern of weeds.

Weed emergence patterns strongly influence glyphosate selection pressure with a tank-mix of glyphosate plus Warrant (Figure 1). Weeds that emerge prior to the POST application (red box) are controlled by glyphosate, whereas the late emerging cohorts (blue box) are controlled by Warrant. With a rapid emerging weed (Fig. 1A), the glyphosate controls approximately 75% of the weed population. In this scenario, there is relatively little benefit in terms of GR management, although the field likely would be cleaner at the end of the growing season due to fewer late-season escapes. Figure 1B shows a slower emerging weed, resulting in less selection pressure for GR than in Fig. 1A, but the glyphosate is still controlling approximately 50% of the weed population. Although this tank-mix approach is a better scenario than relying solely on glyphosate, it still poses a significant risk in terms of selecting for GR.

The key to managing resistance is to use multiple control tactics that place different selection pressures on the weed population. The use of PRE herbicides at or prior to planting provides the greatest opportunity to reduce selection pressure in Roundup Ready crops. To optimize this benefit, products and rates used must be selected to control the major weeds present in the field. A product such as Warrant may enhance the performance of many weed management programs, but in many situations its benefit in reducing the risk of GR will be much less than a residual herbicide applied before or at planting. An excellent alternative would be to use a traditional PRE product followed by a POST application of glyphosate plus Warrant.

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