Glyphosate-Resistant Horseweed In California

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The development of herbicide resistance by weeds is not a new phenomenon. It is a naturally occurring evolutionary process in response to a selection pressure, i.e. herbicides. There are currently 297 different herbicide-resistant weed biotypes globally, of which 27 biotypes are of *Conyza canadensis* (horseweed or mare's tail). The first case of herbicide-resistant horseweed occurred in Japan in 1980 to paraquat. Since then, horseweed has developed resistance to six different classes of herbicides, including the glycines (glyphosate – a Group 9 herbicide). Glyphosate is the active ingredient in Roundup®, Touchdown®, and dozens of other generic brand products registered in California. To date, all cases of glyphosate-resistant horseweed have occurred within the United States, with the first case documented in Delaware in 2000. By 2005, glyphosate-resistant horseweed has been found in 11 different states, including California (Northern Tulare County - July 2005).

In the case of California, resistance evolved due to the repeated use of glyphosate over a number of years along hundreds of miles of irrigation canal banks. Horseweed resistance to glyphosate evolved similarly in the other states where glyphosate products were repeatedly used in crop production areas. Glyphosate is a broad-spectrum herbicide that provides effective control of most weeds and is the most commonly used weed control product in the world. In order to maintain the effectiveness of glyphosate in California, it is imperative that growers, PCAs, and others prevent herbicide resistance and recognize when resistance is occurring and implement tactics to resolve it as soon as possible.

Indications of herbicide resistance include:

- A select number of plants showing significant re-growth following treatment at the recommended label dose and weed growth stage.
- A select number of plants completely escaping treatment, even though they were treated at the recommended label dose and time.
- Higher than label rates are needed for control.
- A shift in weed species occurring after years of treating with the same herbicide(s), even though they were controlled previously at the same recommended labeled rates.

Recommendations for herbicide resistance management:

- Make applications at the optimum time for control (correct weed growth stage and size) using the recommended label rate for the most difficult weeds in your field.
- Base your decisions on a field-by-field case and use a variety of effective tools available to obtain optimum weed control to minimize escapes.
- Avoid using tank-mixtures that reduce the effectiveness or optimum rates of the herbicide.
- Revisit the site 2 to 4 weeks after treatment and eliminate weeds escaping treatment.
- Avoid using the same herbicide or herbicides with the same mode of action year after year.
- Report any incidences of repeated non-performance to your local farm advisor, retail dealer, or chemical representative.

Refer to www.weedscience.org for additional information regarding herbicide resistance.