WISCONSIN POTATO AND VEGETABLE WEED MANAGEMENT UPDATE

Jed Colquhoun, Daniel Heider, and Richard Rittmeyer[1]

Potato and vegetable weed management in the 2018 season was challenged yet again by variable and extreme weather events, the spread of new and often herbicide-resistant weeds and regulatory headwinds. Despite these hurdles, the future looks relatively bright if we're willing to take an innovate and integrated approach to weed management.

Extreme and variable weather events not only made it challenging to apply weed management measures but also increased injury risk. Early-season heavy rains made it difficult in many areas to time pre-emergent herbicides, which put a lot of pressure on the limited post-emergent tools for the majority of season-long weed control. The rapid switch in temperatures from a cool season start to blazing-hot during crop emergence increased the risk for injury from herbicides. For example, soil temperatures Memorial Day weekend were well over 100 F in the Central Sands. Weather challenges at the end of the season remain fresh in our memory, with many potatoes, carrots and other long-season crops suffering frost damage in ground frozen before they could be harvested. Such potato fields should be carefully scouted for volunteers early in the 2019 season.

At a national level, dicamba remains in the news. The initial registrations of three new dicamba products that could be used over-the-top of resistant soybean and cotton were scheduled to expire near the end of 2018. With many concerns over alleged off-target dicamba movement noted again across the country during the 2018 growing season, new 2-year registrations were recently announced by the US EPA that include additional restrictions beyond those introduced last year. However, the details of these new restrictions and implications for dicamba use remain ambiguous as commercial labels are pending at the time of this writing.

Also on the regulatory front, the herbicides linuron and diquat remain in the US EPA pesticide registration review, a process that occurs with all pesticides at least every 15 years. At this time, EPA's registration review schedule now forecasts an interim decision for both herbicides by the end of June 2019.

Nationally, the interest in dicamba is primarily to overcome widespread weeds that have become resistant to glyphosate herbicide. Even worse, this year the first case of resistance to six herbicide sites of action in a single plant was documented in a Missouri waterhemp population. In Wisconsin, we were relatively immune to the widespread herbicide resistance observed among weeds in states to the south of us, but that's changed quickly and is no longer true. UW-Madison agronomy colleagues have tracked the spread of waterhemp in the state and have now found this troublesome weed in 61 counties. In fact, the 11 counties where it hasn't yet been documented are in the farthest northern tier of the state where agriculture is less common and therefore less scouted for such pests. In 2018, there were 28 counties with confirmed glyphosate-resistant waterhemp, up from just 12 counties in 2015.

With these challenges in mind our research program in this area focuses on integration and innovation. Our research portfolio has included about two dozen specialty crops in the past few years such that we can provide solutions throughout the crop rotation and state. Despite the lack

[1] Professor, Distinguished Outreach Specialist, and Senior Research Specialist; Department of Horticulture, University of Wisconsin-Madison, 1575 Linden Drive, Madison, WI 53706.

of new herbicide active ingredients in agriculture in general, we continue to have success "recycling" products developed for major agronomic crops such as corn and soybean for registration in specialty crops. For example, in potato we continue to work four potential herbicide active ingredients toward registration, with two new products in the final stretch with new commercial labels likely in the very near future. Few new herbicides are in development for any crop, so it's time to really think outside the box for new yet practical solutions. In this area, we're working with natural plant growth regulators to make the crop emerge faster and form a canopy sooner, enhancing competition with weeds. In crops like carrot, we've had early success when combining these growth regulators with competitive varieties and optimized planting timing and spacings, with yields greater than the conventional system and reduced reliance on herbicides. We're also interested in how these natural plant growth regulators affect weeds, both in germination and seed production.

In a broader sense, our program continues to develop other programs at the request of the agricultural community, such as the Water Stewards Program, where we now turn our focus from water quantity to quality. This year, we're also putting together a Specialty Crop Task Force to work with growers, processors and others to identify potential new agricultural crops and resulting products that could add value in a time when most commodities are challenged by low prices and increasing production costs. We look forward to continued potato and vegetable community leadership and involvement in these and other programs designed to benefit our diverse Wisconsin agriculture.

Pesticide labels change often. As always, read and follow the label prior to any pesticide use.