

Layer residual herbicides to extend waterhemp control

BY Bryce Nelson

Were you satisfied with waterhemp control in your soybeans last season?

If not, it's time to consider a new strategy.

Herbicide-resistant waterhemp is now widespread. In southern Minnesota, we assume that most waterhemp populations are resistant to glyphosate, as well as ALS herbicides such as Pursuit and First Rate. In addition, some waterhemp populations in the state have developed resistance to PPO-inhibitors such as Valor, Flexstar and Cobra.

As growers know, one trait that makes waterhemp a formidable competitor is its extended emergence pattern. In Minnesota, waterhemp seedlings start emerging in late May and keep coming until August, especially in 30-inch soybean rows. The peak emergence period is typically the first two weeks of July, often outlasting the residual control provided by preemergence herbicides.

One way to extend control longer into the season is to layer, or overlap, soil-applied residual herbicides. In this strategy, a pre-plant or pre-emergence residual is followed by a second residual herbicide application about 30 days after planting. "By layering a residual in early June, you extend control until canopy closure," says Lisa Behnken, University of Minnesota Extension crops specialist.

U-M trials demonstrate effectiveness

Layering residual herbicides is not a new tactic, but it's being talked about more often as glyphosate-resistant weeds proliferate, says Fritz Breitenbach, University of Minnesota Extension integrated pest management specialist. In 2015, University of Minnesota researchers demonstrated the effectiveness of this strategy for season-long control of waterhemp in soybeans.

The trials, funded by the Minnesota Soybean Research and Promotion Council, evaluated three soil-residual herbicides:

- Dual II Magnum (s-metolachlor)
- Outlook (dimethenamid-P)
- Warrant (acetochlor)
- The herbicides were applied preemergence (PRE) only, or as PREs followed by an early postemergence (POST) application at V2 - V3.
- Full rates were applied, based on soil type and seasonal limits.

The three herbicides, all Group 15 products, were chosen because of their effectiveness for controlling waterhemp, and their flexibility of application timing, Breitenbach says. Group 15 herbicides have also shown durability over many decades, with just one resistant weed species. However, overreliance on Group 15 products can lead to more resistant species, he adds.

The research found that with a PRE treatment only, control of glyphosate-resistant waterhemp dropped sharply by late June, just as the peak emergence period began. By contrast, layered or PRE/Early POST applications of a soil residual provided 90% - 95% control through September. That's compared to 62% - 81% control with a PRE only.

Better waterhemp control led to higher soybean yields, which increased 6 to 14 bu./acre in the layered treatments.

Sample overlapping residual programs

The clients I work with have found that this layering tactic works very well for control of waterhemp in soybeans.

In no-till or strip-till fields, I recommend using Sharpen (saflufenacil) in the burndown, for broadleaf control plus residual activity on waterhemp. Follow with an early postemergence treatment of Dual II Magnum, Outlook or Warrant, tank-mixed with Flexstar GT (fomesafen + glyphosate).

In conventionally tilled fields, my clients have seen very good results with a preemergence application of Authority products (sulfentrazone), Boundary (s-metolachlor + metribuzin), or Optill (saflufenacil + imazethapyr), followed by a timely postemergence application of Dual II Magnum, Outlook or Warrant mixed with Flexstar GT.

The precise timing of the second soil-residual application will depend on what products you spray, the stage of soybean development, moisture and environmental conditions, and label restrictions. “There’s a window of 21 to 45 days after planting,” Breitenbach says. But, “It’s better to be on the early side than the late side.”

Also keep in mind that soil-applied residual herbicides won’t kill emerged waterhemp plants, Behnken adds. “These products work on germinating weed seeds only. So you still need to scout and have a plan for controlling emerged weeds.”

In addition, soil-applied herbicides require moisture for activation. But even if the soil is dry, a program of overlapping residuals is recommended. In a dry environment, these chemicals degrade quite slowly, so herbicide will still be available in the soil when you do get moisture and weeds start germinating.

Significant return to practice

As the U-M research showed, the payback for layering residual herbicides in soybeans is significant — especially in problem fields with heavy infestations of waterhemp and other small-seeded broadleaf weeds. For my clients, I also recommend sequential residual applications in newly-rented fields, where you don’t know the weed history.

In no-till or strip-till soybeans, this strategy adds little or no extra weed control expense. In tilled soybeans, it will add \$8 to \$10 per acre of expense, but the cost is usually offset by higher yields. Equally important, this program helps prevent weed seed deposits, keeping your future weed management costs in check.

Bryce Nelson is owner of Advantage Crop Consulting, Rose Creek. You can find information and links to Minnesota certified crop advisers at <http://www.mcpr-cca.org>, and <http://mnicca.org>.

Key points

- Multi-herbicide-resistant waterhemp is widespread in Minnesota.

- Sequential applications of soil-residual herbicides provide season-long waterhemp control.
- The added cost of tank-mixing a residual is offset by higher yields.

Comparing single and sequential residual herbicide applications



University of Minnesota trials compared waterhemp control in soybeans with residual herbicides applied preemergence only, or layered pre- and early postemergence. The soybeans on the left were treated with a single preemergence application of Outlook on May 5. The soybeans on the right were treated with a preemergence application of Outlook on May 5 followed by a second application of Outlook on June 8. (All PRE treatments also included Pursuit to eliminate other broadleaf weeds.) Season-long waterhemp control with a PRE alone was 71%, compared to 94% with a layered program.



Photos: Lisa Behnken, Fritz Breitenbach, University of Minnesota Extension, Rochester

Waterhemp control and soybean yield with residual herbicides						
Treatment (Herbicide)*	Rate (per acre)	Time**	Weed Control (%)			Yield (bu/acre)
			5/27/15	6/26/15	9/29/15	
Dual II Magnum	1.5 pt	PRE	99	91	81	43
Dual II Magnum/ Dual II Magnum	1.5 pt/ 1.0 pt	PRE/ POST	99	96	95	49
Outlook	18 fl oz	PRE	99	85	71	40
Outlook/ Outlook	14 fl oz/ 10 fl oz	PRE/ POST	99	97	94	51
Warrant	1.6 qt	PRE	99	82	62	32
Warrant/ Warrant	1.6 qt/ 1.6 qt	PRE/ POST	98	95	90	46
LSD P=0.01			1	1	7	4
*All PRE treatments included 4 fl. oz./acre Pursuit						
**Application dates: PRE: 5/5/15; Post: 6/8/15						
Source: Lisa Behnken, Fritz Breitenbach, University of Minnesota Extension, Rochester						

2015 trials at the University of Minnesota, Rochester demonstrated the effectiveness of layering soil-applied residual herbicides for season-long control of glyphosate-resistant waterhemp in soybeans. The research found that with a PRE treatment only, waterhemp control dropped sharply by late June, just as the peak waterhemp emergence period began. Layered applications of soil residuals provided 90%-95%

control of waterhemp through September, compared to 62%-81% control with a PRE only. Better waterhemp control was reflected in significantly higher soybean yields in the layered treatments.