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Learn from this year's weed control failures and successes

BY Gary Hartwig and Liz Morrison

We have finished applying herbicides for this season. Weed escapes can be spotted in corn rows or above the soybean canopy. Now is the time to evaluate how well your weed control program worked in 2017 — and how you could improve it in 2018.

“August is a good time to reflect on weed management,” says Lisa Behnken, University of Minnesota Extension educator. If you had failures, what could you have done differently? What worked well this year, and how can you be successful next season?

As you review 2017, ask yourself if you achieved the main goals of a successful and sustainable weed management program. Did you:

- Identify the weed spectrum in each field?
- Use multiple, effective herbicide modes of action?
- Apply effective preemergence residual herbicides?
- Make well-timed postemergence applications with residual activity?
- Include non-chemical tactics?
- Limit the number of weed seeds entering the soil?
- Prevent yield losses from weed competition?

Which weeds escaped? The first step in assessing your weed control program is to identify surviving weeds so you can target them for future control. Also document which fields had significant weed escapes this year, and will therefore contribute to the weed seed bank. Next season, give these fields extra attention.

Why did weeds survive? It's important to understand why some weeds survived, in order to avoid the same problems next year.

The most obvious way that weeds survive is by avoiding herbicide exposure altogether:

•*Did survivors emerge after your preemergence (PRE) herbicide had degraded, due to a low application rate, too-early application, or excess rainfall?*

•*Did weeds emerge after your postemergence (POST) application?* Pigweeds such as tall waterhemp and Palmer amaranth, for example, have long germination periods. They can grow under the crop canopy and produce seeds, adding to your future headaches.

•*Did you apply the right herbicides?* Were the products highly rated for control of the problem weeds in that field?

Was your PRE effective? Two factors that influence the performance of PREs are moisture and soil type:

•*Was your PRE application rate correct for the soil type?* Always apply the full labeled rate. “Set-up” rates are no longer recommended.

•*Was rainfall adequate to activate the PRE herbicide?* Rainfall is out of your control, of course, but even if moisture levels are unfavorable after a PRE application, you will

still get some residual weed control, which cuts weed density and extends the window for timely postemergence applications.

Was your POST effective? Postemergence herbicide performance is influenced by weed size, spray coverage, and environmental conditions:

•*How big were weeds at application time?* In the glyphosate era, we were able to kill weeds that were much taller than the labeled maximum. But those days are over. Today, we must attack weeds when they are “matchbook size,” as Behnken puts it — two to three inches tall.

Spraying weeds that are too big is one of the most common weed management mistakes. Remember that profitable weed control is all about *when* you kill weeds. Weed competition, especially early in the season, can cost you dearly. University of Minnesota trials at Rochester in 2014 showed that corn yields suffered by 40 bu./acre when weed control was delayed by just five days beyond the optimum time for removal.

•*Were your application methods rigorous?* Did you use the correct water volume, spray pressure, spray additives and nozzles? Remember that with contact herbicides, such as Liberty, you need to cover every growing point on the weed to get complete control.

•*Did you spray when environmental conditions were unfavorable* — too cold, too windy? Follow the herbicide label.

Are weeds in the field becoming herbicide resistant? Resistance to glyphosate (Group 9) is common in hard-to-control weeds such as giant and common ragweed, tall waterhemp, and kochia, Behnken says. Stacked herbicide resistance is also on the rise. Some Minnesota populations of ragweed and tall waterhemp, for example, are also resistant to ALS-inhibitors (Group 2) such as FirstRate and Pursuit, and PPO-inhibitors (Group 14), such as Cobra and Flexstar.

When weeds in a field are first becoming resistant to a herbicide, you’ll often find surviving plants right next to dead plants of the same species. That’s a clue to change your management:

•*Did you apply multiple modes of effective action against target weeds?* To slow resistance development, you should try to hit target weeds with more than one effective mode of action with every spray pass. Tank mixing is more effective than sequential attacks.

•*Did you follow a multi-year weed control plan?* Mapping out a two- or three-year herbicide plan will help you rotate modes of action and avoid overusing any one herbicide group, Behnken says.

•*Did you include non-chemical tactics?* Delayed soybean planting, effective pre-plant tillage, or timely in-season cultivation are all ways to control herbicide-resistant weeds. Hand-pulling weed escapes, mowing field edges and cleaning up fencerows helps avoid weed seed bank deposits.

“The time you invest in making a weed control plan, evaluating the plan, walking your fields is well worth it,” Behnken says. In the era of resistant weeds, “What you do on your farm really matters. So take control, take action.”

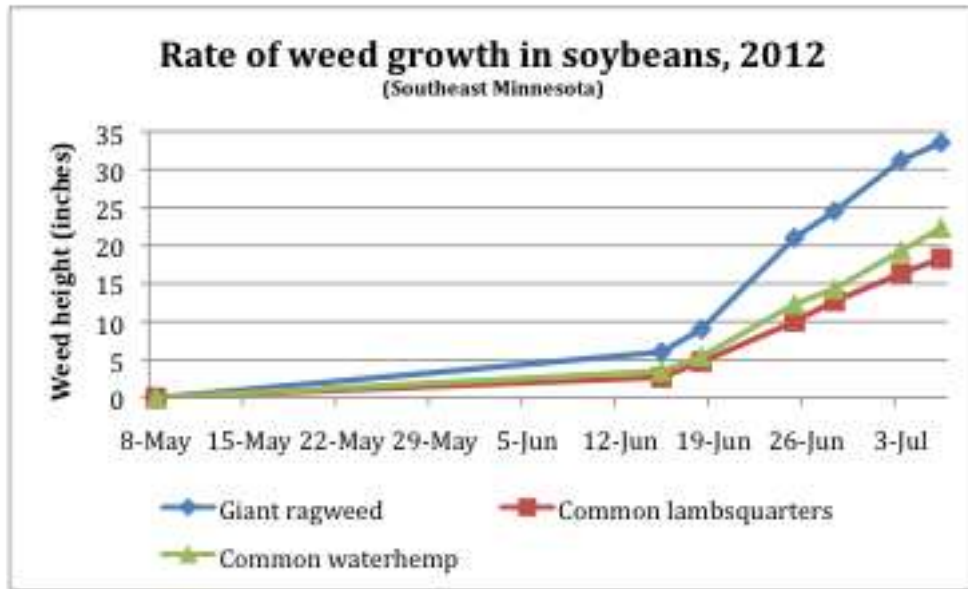
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Key points

- Evaluating this season’s weed control can improve management next year.
- Preemergence residual herbicides should be part of your plan.
- Well-timed POST applications are essential for profitable weed control.

[Graphics]

The importance of killing weeds when they are small



Source: Lisa Behnken, University of Minnesota

To avoid significant yield losses, weeds must be killed *before* they reach four inches.

Penalty for delayed weed control in corn, 2014		
—POST Application Timing—		
Crop Stage (corn)	Weed Height (primarily lambsquarters)	Yield (bu./acre)
V2	1” – 2”	207
V4	3” – 4”	202
V6	6”	162

Source: Lisa Behnken, University of Minnesota

Profitable weed control is all about when weeds are killed. In University of Minnesota Extension demonstration plots at Rochester in 2014, the critical weed control window in corn lasted from V2 to V4, about 11 days. That means there was no significant yield loss from early season weed competition when weeds were killed by V4. But when weeds were allowed to grow for five more days, to V6, corn yield fell by 40 bu./acre.