North Dakota Soybean Council
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NDSU's Joe Ikley helps farmers identify different weeds at KMOT Ag Show in Minot.

Concerns With Kochia

Kochia remains to be the most-challenging weed in North Dakota, especially with the development of resistance to multiple herbicides.

"Kochia would be our number one weed statewide," contends North Dakota State University (NDSU) Extension Weed Specialist Dr. Joe Ikley. "We just continue to deal with more kochia issues. The drought last year really made kochia an issue for us. It produces a tremendous amount of seed, so we anticipate kochia will be back with a vengeance again in 2022."

Ikley says that kochia is a very drought-tolerant weed that grows in areas where farmers have issues establishing crops, such as saline areas or sodic soils. Kochia is also well suited for drought. Kochia hadn't been an issue in some of the fertile soils of southeast North Dakota, but thanks to the 2021 drought, the threat continues to spread.

"Kochia can have quite robust root system and is able to find water in areas where crops can't," Ikley states.

Along with being present in every North Dakota county, kochia is becoming increasingly difficult to control because it has developed tolerance to some herbicides.

Growing Resistance to Herbicides

Ikley explains how, for decades, kochia has shown increased tolerance to 2,4-D, so the rates of 2,4-D that farmers can use with Enlist soybeans alone won't be enough to control kochia. Ikley says that there is also widespread resistance to Group 2, ALS-inhibiting herbicides.

"We do have quite a bit of glyphosate resistance around the state, and that's increased in its footprint in the last three to five years. So, controlling kochia of course, is becoming a major issue for us in soybean production," Ikley asserts. "Then, we do have some resistance to dicamba."

Ikley states that there are also certain level of resistance to fluroxypyr (Starane), which is frequently used with wheat. Fluroxypyr is another growth regulator that is similar to dicamba.

"If dicamba resistance continue to grow, that's going to make it more difficult for soybean growers as well, even in the Xtend® soybean system," Ikley contends.

Kochia control in soybeans starts with a good pre-emerge herbicide.

Scientists have conducted several years of research at NDSU North Central Research Extension Center, applying flumioxazin (Valor) on no-till ground in the fall before the ground freezes. Ikley says that, because kochia is one of the earliest-emerging weeds, there is residual chemistry left in the soil when kochia germinates. Ikley states that a fall pre-emergence application doesn't work as well with conventional tillage.

For traditional pre-emerge applications, Ikley describes the best options are applying herbicides with sulfentrazone (Trade names include Authority or Spartan.) or metribuzin (including Sencor or Dimetrice). Ikley explains that farmers can get some control with flumioxazin, but it isn't as effective as sufentrazone and metribuzin.

"If we use the half-pound rate of dicamba, we can get some residual activity out of that as well," Ikley says.

Good kochia control starts with a good pre-emergence program, but for post-emerge applications, Ikley states that one of the best-available tools is using dicamba and the Xtend® soybean system. Another effective option that farmers have is glufosinate, which is available in products such as Liberty®.

"The issue we'll run into with kochia once it gets over three inches is there's just a lot of growing points on kochia. If you don't get complete coverage with something like glufosinate, then you'll burn some of the tissue, but it will regrow," Ikley explains. "Once kochia gets over two or three inches, it becomes a lot more difficult to control with any of herbicide options. That's one of the reasons dicamba is so popular. It can do a little bit better on those three- or four-inch-tall plants than some of the other options."

Kochia does have the ability to regrow and produce quite a lot of seeds even after the wheat fields have been harvested. Ikley asserts that, if wheat fields had poor control last year and nothing was done for good management after harvest, there could be a lot of kochia seed waiting to germinate.

"If you had a problem last year, you'll probably have an issue again this year," Ikley warns.

Multi-Crop Management

NDSU and University of Minnesota Extension Sugarbeet Agronomist Tom Peters knows full well the challenges that kochia presents to North Dakota and Minnesota farmers.

"I worry a lot about water hemp in sugarbeets, but I'm scared to death of kochia because there's just so few tools that we have, period," Peters says. "I just don't want to see it re-establish itself here."

Most North Dakota farmers plant a variety of crops. Peters encourages farmers to look at the big picture when managing kochia.

"I would say that the best program for managing kochia in sugarbeets is your crop rotation. What you used in soybeans two years ago and what you used in wheat last year. That's your best program," Peters explains.

Peters asserts that good weed management involves a plan, not just reactionary tactics.

Peters continues, "You have to manage the fields that you're planting to sugarbeets, not just sugarbeet fields. The message I give to growers is, if there's going to be sugarbeet somewhere in the crop sequence, then prepare for that by knowing what your most important weeds are in your fields; then, plan and do something about them."

Crop rotation and monitoring the weed control are important for controlling kochia. Because kochia can blow from neighboring fields or uncontrolled areas, such as ditches and railroad right of ways, kochia control requires farmer vigilance.

—Story by Daniel Lemke, photo by staff

For more information, download NDSU's 2022 Weed Control Guide: bit.ly/NDSU2022weedguide