Focus In Pigweed Fight Shifts From Thresholds To Seed Banks

MONTICELLO, ARK.

The fight against herbicide-resistant pigweed is shifting from thinking about weed density thresholds to managing the amount of weed seed in the soil, said Dr. Ken Smith, extension weed scientist for the University of Arkansas Division of Agriculture.

Weed resistance to glyphosate, also known as Roundup, has been a growing issue for Arkansas soybean and cotton producers. Researchers with the University of Arkansas Division of Agriculture have been working to find other tactics to manage resistance in pigweed, johnsongrass and four other weed species.

Typically, producers were urged to take specific pest control actions when the number of weed plants reached a particular density in the field. That focus is shifting to managing seedbanks in the soil as resistant populations build.

Pigweed ensures its survival through rapid growth, a deep root system, and abundant seed production. On the average, each pigweed plant can produce 13,000 to 35,000 seeds. Researchers are focusing on the plant's Achilles' heel - its short-lived seed, Smith said.

"We do know that pigweed seed has a fairly short life in the soil - 99-plus percent is gone at the end of four years," he said.

Deep tillage is a promising tactic that exploits pigweed's weakness.

"Deeply buried seeds do not germinate because they require light and oxygen for germination," Smith said. "Soil microorganisms and insects prey heavily on pigweed seed."

Once the seed coat soaks up water and when "there's insufficient light for germination, the seed loses viability," he said.

Burndown, a common field preparation method, doesn't destroy pigweed seed, he said. "In fact, it probably creates light that stimulates germination."

Another tactic being field-tested is "zero tolerance" – a method that combines hand hoeing and supplemental herbicide application to ensure that pigweed doesn't reach maturity and produce seed.

Zero tolerance is being tested in two Arkansas cotton fields, one in Mississippi County and the other in Phillips County. The researchers selected the fields because they have a history of resistant pigweed infestation, aren't flood-prone, and don't receive runoff from infested fields.

"We are providing help for these growers in terms of scouting and advising," Smith said.

Smith said researchers are also planning to test the tactic in soybeans. Δ