U Of A Division Of Agriculture Develops Strategies To Combat Herbicide-Resistant Barnyardgrass

FAYETTEVILLE, ARK.

Herbicide-resistant barnyardgrass has been found in a few Arkansas rice fields, but University of Arkansas System Division of Agriculture scientists said the resistant weeds have not affected many fields yet.

"We've been aware of this problem for years and we have some good programs and recommendations in place," said Extension weed specialist Bob Scott. "We feel like we discovered it early on and it's not widespread in Arkansas."

Those weed control programs and recommendations are based on research supported by the Arkansas Rice Research and Promotion Board.

Weed scientist Jason Norsworthy said there are about seven known barnyardgrass populations in the state that have some resistance to ALS herbicides. The odd thing, he said, is that not all these populations are resistant to the same herbicides, although some of them are resistant to all ALS-herbicides.

ALS (acetolactate synthase) is the enzyme in the weed that these herbicides act on to kill the plant, Norsworthy said.

Weed scientist Jason Norsworthy conducts research on weeds, including herbicide resistant barnyardgrass, that infest rice fields.

Variations in how the chemicals interact with the enzyme account for why some barnyardgrass populations are resistant to different herbicides.

When relying on a single herbicide to control a weed, Norsworthy said, a lot of selective pressure is put on the weeds, leaving a population with resistance. "You get in a single system and don't get out of that by changing control systems or rotating crops," he said, "you end up with a process that leads to resistance.

Within four to five years of continuous Newpath use in rice, there is a high probability of developing herbicide-resistant barnyardgrass.

Newpath and Beyond are the herbicides of key concern. Newpath, in particular, is used with Clearfield rice on about two-thirds of Arkansas rice acres, Scott said. Fortunately, he said a lot of farmers are using Command herbicide in combination with Newpath and that helps prevent buildup of ALS resistance.

"That's effectively two modes of control instead of just hitting it with one herbicide," Scott said.

"What concerns us," Scott said, "is the growers who are using only Newpath."

Josh Wilson, a graduate student working with Norsworthy, has conducted research, supported by the Arkansas Rice Research and Promotion Board, on alternative weed control systems that take the selection pressure off of Newpath.

"Josh's research shows that the more complex the weed control system, the less likely that resistance will develop," Norsworthy said.

Results from the research have been published in the B.R. Wells Rice Research Studies 2010 available from the Division of Agriculture (479-575-5670 or nkyle@uark.edu — ask for Research Series 591).

In the meantime, Scott said the Division will continue its efforts to educate growers about the risks for developing resistant barnyardgrass and about the options they have to avoid the problem. Δ