Wheat curl mite might require non-chemical control

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The wheat curl mite is a minute menace that wreaks havoc on the region's wheat crop; but it has no enemies currently that can take it out. That doesn't mean Texas AgriLife Research scientists aren't trying to find ways to curb its appetite.

Three AgriLife Research scientists, working under Dr. Charlie Rush in plant pathology and Dr. Jerry Michels in entomology, are taking a close look at the damage caused by the wheat curl mite to determine some best management practices for producers and researchers.

They explained their current research at the recent Southwestern Wheat Research and Education Consortium meeting held in Amarillo, a gathering of scientists from Texas, Oklahoma and Kansas working on wheat issues.

Jacob Price, AgriLife Research associate researcher-plant pathology, participated in a virus survey in 2008 that encompassed most of the central U.S.

In the survey, the most common wheat viruses found in the 75 million acres of wheat across the U.S. - 3.3 million acres in Texas - were wheat streak mosaic virus, wheat mosaic virus (formerly High Plains virus) and a fairly recently discovered one, Triticum mosaic virus.

These viruses all have one common factor; they are all vectored by the wheat curl mite. And the hot spot for all three viruses was Texas, Price

said.

Because there are no chemicals labeled for control of the wheat curl mite, researchers must find other ways to combat it.

Price said one way will be to work with wheat breeders.

"Because we found Triticum at such a high prevalence, it would be wise for the breeders to work closely with the pathologists when these new diseases come in," Price said. "We can work together to develop genetic resistance for problems facing us now and those that might affect us in the future."

Dr. Fekede Workneh, an AgriLife Research scientist in plant pathology, has been working to model the gradient of severity of wheat streak mosaic and its impact on grain yields across the field.

Volunteer wheat and grass vegetation are the green bridges that allow wheat curl mites to exist through the summer until the new wheat crop starts growing. The most damage appears to occur if infestation takes place early in the fall; however research is under way to determine the impact of time of infection, Workneh said.

The distance of these bridges from the wheat field can determine the severity of the virus damage, Workneh said.

"If it is a distant source, you will see sporadic and random occurrences across the field, because the mites are carried in the wind and their population gets diluted and dispersed," he said. "But the closer the source of mites, you will see more of a gradient virus infection in the field, beginning at the edge."

Workneh's advice is for growers to plant in mid-October or later if they

know they have a source that will harbor the mites, and they want to break the green bridge between that source and the wheat crop.

"This probably is not practical advice for some, because wheat destined for grazing is planted early so that there would be enough forage for the cattle in the fall and winter," he said. "However, getting rid of any volunteer wheat nearby would definitely reduce the risk."

Chanda Henne, an AgriLife Research research technician in the entomology program, is trying to help growers recognize what plants, other than wheat, might serve as hosts for the mites.

She has verified that the wheat curl mite can be found on many grasses in the Texas Panhandle.

Henne tested six warm-season grass species, including Texoka buffalograss, Blackwell switchgrass, Hachita blue grama, Spar Old World Bluestem, Wrangler Bermuda grass and Haskell sideoats grama to see which ones serve as reservoirs for the mites or carry the virus.

Her study was conducted at the AgriLife Research station near Etter, where these grasses are growing under full irrigation, limited irrigation and dryland conditions.

While she has been collecting data for only about five months, she's found the switchgrass and blue grama grasses had significantly more mites than the other species. Both of these are native species and commonly used in the Conservation Reserve Program fields.

"Every time we went out there to sample, the mites were present, but they were not always present on all species," Henne said. "The only grass species that had mites on it every time we sampled was blue grama."

Source: Texas A&M AgriLife Communications