Field Notes
May 18, 2009
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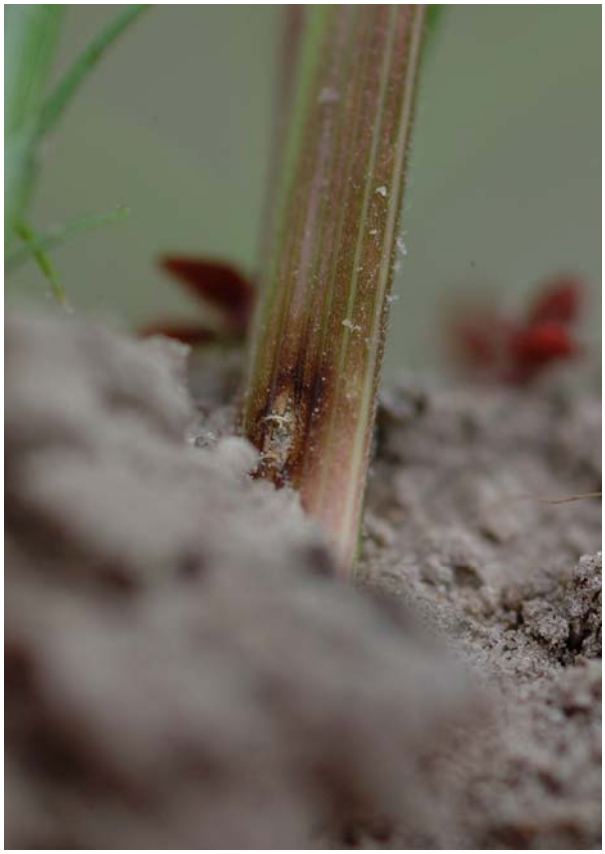
Last week in our verification field in Avoyelles parish we found plants that looked like those shown in the photograph at right. There were two problems, one we could identify and one we could not. The obvious problem was heavy rice water weevil adult feeding to the point that we were tempted to make an insecticide recommendation even though the field was not flooded. Instead we elected to wait until either we flushed or flooded the field.

The other problem is nutrient related. The soil pH is around 8. The logical nutrient to suspect is phosphorus, but the symptoms were not typical of phosphorus deficiencies I have seen. We chose to apply a heavy dose of zinc chelate and will see.

Although it has not been reported as often as in the past and it is early to find the problem, the field at left is apparently suffering from localized decline. Dr. Gary Breitenbeck and graduate student Joe Kraska worked on this problem until the funding ran out. In nearly every instance the plants showed high levels of iron and aluminum in their tissue. The more difficult question is, "Why is this happening?" Dr. Dustin Harrell found a relationship between plants showing similar symptoms and zinc deficiency when he applied high levels of zinc to plants like these and got a strong positive response.

We will continue to recommend draining as the first line of defense and high rates of Zn until we discover more.



On the previous page are 4 photographs that are related in that they are from fields where there were problems for which we could find no obvious answers.

The top left photo shows yellow drill rows of rice among the heavy weed population. The field had received no herbicide and there was no evidence of drift. There were extenuating circumstances that had prevented herbicide application. The variety was a RiceTec Clearfield hybrid. The upper right photo was a close-up of the same rice. The bottom left photo is from a field a few miles away that was also planted to a RiceTec Clearfield hybrid. It had already received one herbicide application. In both fields similar lesions could be found near the soil line. In both fields we also found lots of critters like the one shown in the bottom right photograph. If you read Dr. Hummel's Insect Notes this week she told you it is a lady bug larva and an excellent predator of aphids.

We did find a few aphids that turned out to be green bugs. These aphids are common in wheat and a few other crops. They are particularly damaging because not only do they use their piercing-sucking mouthparts to suck juices out of the plant tissue, they also inject toxins at the same time. They have been reported in rice, but I have never seen them causing damage in rice. Were they the cause of the damage here? We really don't know because the population we saw was very small. Did the lady bug pupae clean up the population? Maybe, there sure were lots of them in the field. We expected to find grape colaspis, but found none. Nothing definitive could be derived.

We also asked Dr. Don Groth to check the lesion at the soil line for evidence of plant pathogens. He was unable to get any spore production from them.

In the process of elimination we could eliminate herbicide injury and probably disease. Does that mean it must be insect damage? Not necessarily because there are many environmental factors that could have been in play that we could not identify. A common factor I deliberately left out is that both fields had been drained and were very dry. One field was being flushed and we suggested the grower flush the other. It is just one more example of how Mother Nature throws us a curve ball every year.

On the next page are two photographs taken at the same field last week. The area affected most severely was relatively small. In the first photograph is a very dark lesion near the base of the split stem. When you see this you can call a priest because this plant is almost gone. Quite a few of the plants simply broke off at the soil line. The second photograph shows foliar symptoms on less severely affected plants. When I saw them I immediately suspected Newpath injury. I sent the photographs to Dr. Webster who said he could not be sure. Without taking leaf samples and sending them off to a diagnostic lab we could only speculate. If we find out something certain we will let you know.

I am still getting questions about keeping volunteer stands of rice, especially of hybrids. Even though this was addressed in the May 1 edition of Field Notes it is serious enough to merit further comment.

No stands of volunteer Clearfield rice should be allowed to grow and produce seed. This is critical with both hybrids and pure line varieties, but particularly with hybrids. This also applies to volunteer populations in land idled this year. Both situations invite outcrossing with red rice. If outcrossing has already occurred it is a great way to increase the population of these outcrosses. The best way to eliminate them is to apply a heavy dose of glyphosate **and** to plow them down. In idle land this should be the obvious conclusion. Where there is the temptation to try to grow out the crop then harvest it, not only is it illegal it could be disastrous to the whole Clearfield rice production system.

If the variety in question is a pure line variety (CL 131, CL 151 and others) there is a real possibility that a few red rice plants may have crossed with the variety in 2008. The result will be Clearfield resistant red rice plants. More crosses are probable in 2009.

The hybrid issue is more complex. A hybrid variety is the product of cross between two pure line parents. The resulting population that is sold as a hybrid variety is the F1 population (first

filial). When the seeds of these varieties are planted each plant is for all practical purposes identical. These are the seeds purchased as a hybrid.

When hybrid seed are planted nearly all of the pollination that takes place to produce the grain to be harvested is a consequence of self-pollination, that is, pollen comes from the same plant or an identical plant. This population is called the F2 generation. The seed that are harvested as grain are identical physically, but not genetically. The seed can be sold as grain.

If the seed are planted, or in this case volunteer, it produces an F2 (second filial generation) population. The resulting population will segregate to the maximum degree. This means there will be more different kinds of plants in this population than in any other population. If the original parents were greatly different the population will be extremely diverse. Every form of rice you can think of will be present: there will be tall plants, short plants, hairy plants (pubescent), smooth plants (glabrous), awned plants, awnless plants, black hulled, straw hulled et cetera. Some of these plants will look so much like red rice it will require DNA analysis to determine whether they are crosses with red rice or not. There might even be different grain lengths in the same field. This is great if you are a rice breeder and are looking for new types of rice. It is catastrophic if you are a farmer.

The immediate problem is what is going to be done with the "crop" if it is harvested. No mill I know of will buy lots of mixed grain when there is an abundance of good rice out there. The second problem is that when it is sprayed with Newpath one fourth of the population will be killed, one half will have reduced tolerance and the last fourth will be very tolerant of Newpath. It is going to be a mess – for a long time.

I equate keeping a volunteer hybrid population with deliberately planting red rice. I sure would not want it on my farm.