Field Notes

May 16, 2014

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It has been a while since I have seen plants showing these symptoms. They were much more common in water seeded rice and are typical of several herbicides, all in the ALS group. Yellowing of some of the leaves and "fish hooking" of emerging leaves. These are leaves that are unable to emerge easily from the rolled up leaf sheath of the previous leaf. The collar region of the older leaf is constricted causing the new leaf to force its way out through the side of the leaf sheath instead of through the collar region.

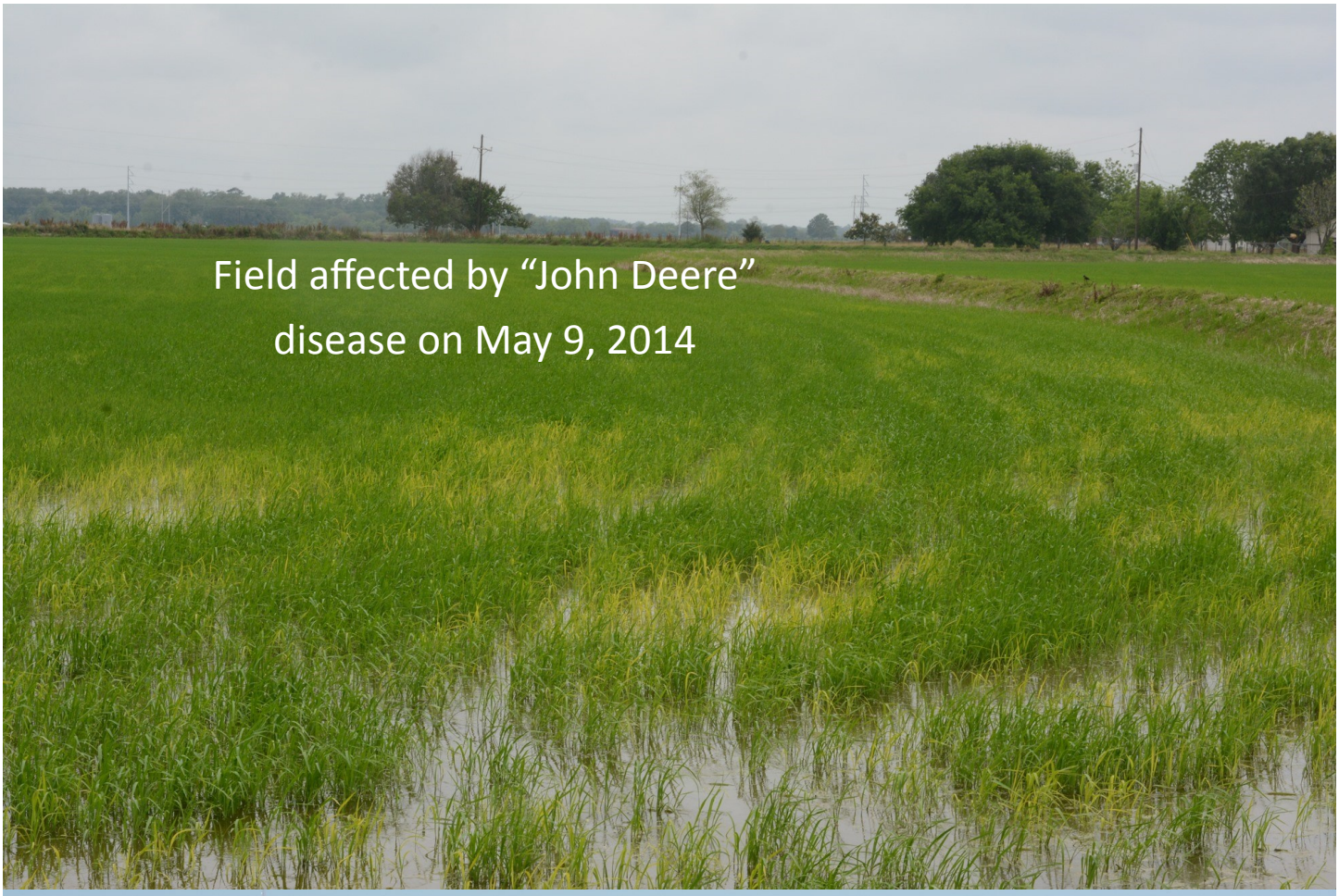
In this case the culprit is Londax, a herbicide used on hundreds of thousands of acres without incident, but every now and then this happens. It is unpredictable and something we have never duplicated (to my knowledge anyway) in research plots. Londax had been impregnated onto fertilizer and dropped into the water. Whether the application in this manner is related to the problem or not I do not know. However, I suspect placing the herbicide directly on the soil and very near the root system may have exacerbated the problem.

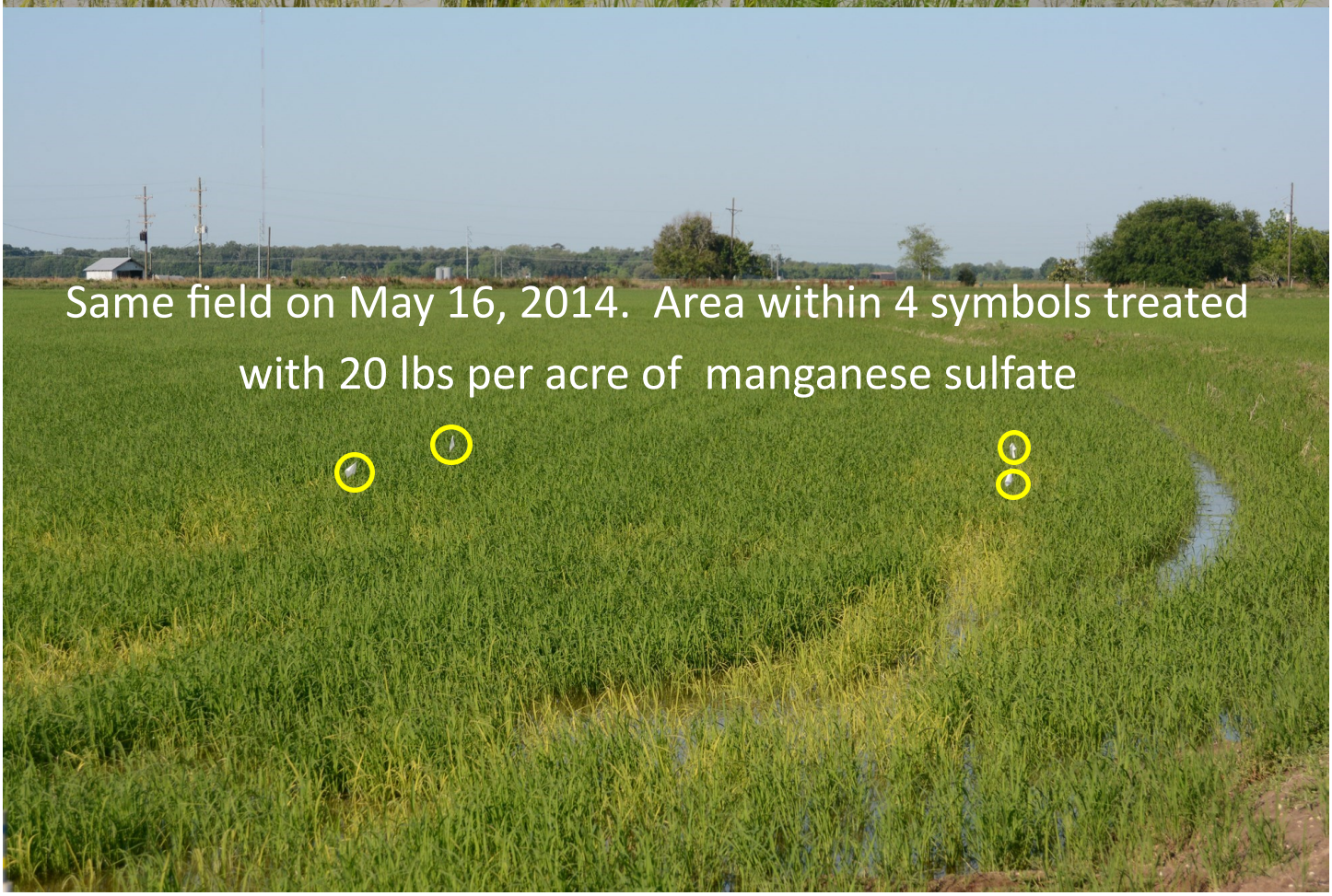
Even though nitrogen had just been applied we recommended draining. We do not think nitrogen loss will be that great because the plants are fairly large, nitrogen will continue to be taken up following drain, and another couple of weeks after re-flooding will be necessary to cause nitrogen losses.

At left is a photograph of the underside of the crown area of the root system of several rice plants. Of note is the black area at the center of the crown. We were called to the farmer's field because he said his rice "just did not look right." We collected some of these plants with the intention of taking them to Dr. Groth for examination. We also noted some stunting of roots that could be attributed to the herbicides used earlier, but not enough to account for all of the symptoms.

The black areas did not have the characteristic rotten egg odor associated with hydrogen sulfide toxicity. When we discussed this the farmer mentioned he had a nearby field that had to be drained last year for that reason. In my experience if hydrogen sulfide toxicity is a problem in an area it can become a regular issue as it has in some parts of Cameron and Calcasieu parishes.

It was well over 48 hours from the time I collected the plants until I was able to take them to Dr. Groth. I decided to check them again before doing so and realized the black color was now gone. My chemistry is pretty rusty, but I think the change in color is likely the result of oxidation of iron rather than hydrogen sulfide. In either case the remedy is draining.


Field affected by “John Deere”
disease on May 9, 2014


Same field on May 16, 2014. Area within 4 symbols treated
with 20 lbs per acre of manganese sulfate

On the preceding page are two photographs of the roughly the same area of the same field. (Note trees in background for reference). On May 9, 2014 Dr. Harrell and I visited a farmer's field where the phenomenon locally referred to as "John Deere" disease has been a consistent problem for the past several years. Over time we have collected soil and tissue samples which point to a possible manganese deficiency. The literature on rice nutrition makes little or no mention of manganese even though we do know it is one of the essential elements for plant growth.

Dr. Harrell suspects it is not a simple deficiency, but one brought on by increasing pH on many fields in the area where alkaline water has been used to irrigate for many years. Without baseline data we do not know if the water was always alkaline or is becoming alkaline. We do know that long-term use of alkaline water will result in increasing the pH of the soil from deposition of calcium. All micronutrients with the exception of molybdenum decrease in availability as pH increases. Manganese is a micronutrient.

Soil tests indicate the soil pH is rising. On their own the farmers have applied sulfur and are using ammonium sulfate fertilizer to try to slow down or even reverse this trend.

With this in mind Dr. Harrell put out several plots in another field using two rates of manganese sulfate, half with sulfur and half without. Naturally, this field is not showing any symptoms anywhere in the field even though the farmer assured Dr. Harrell it "always happens in this field". Such is the nature of off-station research especially when dealing with obscure problems. We will continue to monitor the field and let you know if anything is revealed.