Be Diligent: Help Minimize Strobilurin Fungicide-Resistant Pathogens in Rice

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For many years now, strobilurin fungicides have been used to manage sheath blight disease of rice and they have been the backbone for managing fungal diseases of rice in Arkansas and other Southern rice producing states. However, troubling news came in the summer of 2011 from Louisiana where failure of the fungicide to control sheath blight was confirmed in a few fields. This is a wake-up call for all of us as to how we use these fungicides and why we should consider integrated management more than ever.

Syngenta confirmed resistance to azoxystrobin in Louisiana based on tests done from samples collected from affected fields. In response, we collected samples from fields in Arkansas with known long-time use of fungicides and sent them in for testing. Fortunately, all our samples were negative for resistance to the strobilurin fungicides. So, WHAT SHOULD WE DO NOW?

The awareness message from the neighboring state is an alarm for us to be careful in our fungicide use. If we continue down our current usage path, it is likely that resistance will develop here. The strobilurins in rice including Quadris = azoxystrobin; Gem = trifloxystrobin; Stratego = trifloxystrobin + propiconazole; Quilt and Quilt Xcel = azoxystrobin + propiconazole, may someday fail together and there is not much in the commercial pipeline to replace these products, if anything.

Current fungicides are most effective under low or moderate disease pressure. The challenge comes when varieties are highly susceptible and environmental conditions are very favorable for disease development. Historically, we have difficult sheath blight situations in Arkansas, and producers are accustomed to using strobilurin+propiconazole fungicide mixtures to combat sheath blight and the smuts. While our past research has shown an economic benefit using fungicides on only about 40% of tested acreage, we routinely treat 70-80% regardless of disease pressure. Preventative and routine fungicide applications are more likely to result in the development of resistance than applications based on scouting.

Smuts were bad in some fields of Arkansas in 2011. Certain fields appeared to have been sprayed properly with propiconazole-containing fungicides to minimize these diseases. Concern was expressed by affected growers and consultants as to the possibility of resistance to propiconazole in the kernel smut fungus. Our laboratory tests did not find evidence of resistance although further testing is needed and planned. We did note that is some cases, too much nitrogen was applied to affected fields and in other cases, the fungicide was applied too late in the booting stage for maximum effect. We continue to study the possibility of resistance in the kernel smut pathogen.

In 2009, with all the rain, we battled rice blast with fungicides extensively but were defeated in many instances. When walking fields where the fungicides failed, in all cases there were three fundamental problems – highly susceptible varieties planted on blast-prone soils; lack of
effective irrigation; and too little, too late application of fungicides. Yes, even in rainy years it is important to have a deep flood on susceptible varieties where blast is a potential problem.

Here are some tips to maximize effectiveness of our fungicides and preserve them for the near future:

1. For sheath blight, scout and spray – do not spray all acreage “just because” or “I’ll sleep better if I do”. Hybrid fields and medium grains are very unlikely to benefit from fungicide applications, although some fields of CL XL745 have been known to, where pushed with lots of fertilizer. Fungicides should be applied if your effective scouting indicates more than 35% positive stops in susceptible varieties and more than 50% positive stops in moderately susceptible varieties. Please refer to MP 154 - Arkansas Plant Disease Control Products Guide -2012 or contact your county agents for the rate and timing of application. It is important to note that the sheath blight fungus can be moved from field to field in soil and water and by equipment, so if we ever observe resistant sheath blight it would be important to remember this.

2. The rice smuts cannot be scouted for, so preventive treatment with propiconazole containing fungicides is the only chemical control option. Fields with a strong history of the smuts, or those that have been knowingly over-fertilized with nitrogen are most at risk. Some growers have learned to “back off” their pre-flood nitrogen over time so they minimize smut without sacrificing yield – this can be more effective than the fungicides. Others are trying the new N-ST*R soil test to better manage smuts in problem fields.

3. Timing and rate of the fungicides to prevent the smuts are critical. The fungicides need to be applied at early to late boot but before heading begins on any plants in the field. Earlier is usually better in the booting stage, to be honest, especially for false smut. The minimum rate of 6 fl oz tilt or tilt equivalent is now required for most effective results under current conditions, but no application will provide 100% control. In the past, we achieved up to 95% reduction in kernel smutted kernels using propiconazole with exact timing and rate but only about 65% for false smut (at best). Where false smut is moderate, 65% reduction is noticeable, but where it is heavy, not so much.

4. In blast-prone fields (lighter soils, tree-lined, low-lying, etc.), plant a hybrid or resistant variety. This takes care of the disease for the most part. Where susceptible varieties are planted in the wrong field, keep a deep flood on them at all times after initial flood. A deep flood is 4 inches in the shallowest part of the paddy. The effective fungicides work best if applied twice for blast, thus our basic recommendations. The first application should be made at late boot to beginning panicle tip emergence and the second when panicles are 50-75% out of the boot on most of the main tillers. Higher rates are best. If the field is very uniform and disease potential is low to moderate and only one application can be afforded, then the best timing would be when panicles are emerging with about 35% of the length out of the boot on most of the main tillers. In uneven maturing fields, it is better to spray based on the earlier maturing parts of the field if disease pressure is substantial, and these types of fields would be almost automatic for two applications. Again, proper flood management will really help with blast management and improve performance of the fungicides.

To sum up –
Scout for sheath blight before spraying, do not make automatic applications
Use recommended rates and timings
Spray at early to mid-boot for the smuts
Use 6 fl oz Tilt equivalent for the smuts, not lower rates
For blast, plant resistant varieties in problem fields
Keep the flood deep in blast prone fields
Use the correct timing and rates for blast, do not wait too late to spray
Contact us to inspect fields where the fungicides have failed