

## New Option for Brown Rust Control?

Brown rust has been reported to be an important disease in most sugarcane production areas around the world. To say that rust is a universally important disease does not mean that it is causing serious losses wherever it occurs. It is considered important because it has the potential to cause serious losses. Yield losses due to brown rust as great as 40% have been reported. In Louisiana, losses ranging from 15-20% have been documented in fields of the major variety, LCP 85-384, for the last three seasons.

Due to the potential for serious loss, brown rust must be given continuous consideration in disease management programs. Traditionally, brown rust has been managed by breeding and selecting for disease resistant varieties. As with many genetic traits in sugarcane, if priority is given to crossing and selection, resistance to rust can be accomplished. The development and release of resistant varieties is considered very desirable since effective control is provided with no out-of-pocket expense or effort required from farmers. However, there is an indirect cost in promising clones lost to rust susceptibility in the breeding program. The more selection variables that are imposed, the harder it becomes to obtain agronomically superior varieties. Another major concern is that resistance may not be durable.

Rust diseases are very important in all of the major graminaceous crops. Part of their importance comes from the fact that pathogens of this type are famous for being able to adapt to and overcome host plant resistance. This is always a concern when relying on resistance to control rusts. The cycle of release and loss of varietal resistance makes rust diseases a cyclical problem and continuous threat. Considerable resources and effort goes into the development of a successful commercial variety. To have the productive life span of a variety cut short by succumbing to rust can be an economically painful loss. In addition, replacement varieties sometimes do not have the same yield potential as the variety they are replacing.

LCP 85-384 was considered resistant to brown rust at the time of its release. Due to the large yield advantage this variety offered relative to the other commercial varieties of the time, the area in Louisiana cultivated with LCP 85-384 increased rapidly. In 2000, when it was planted on 71% of the production area, a major outbreak of brown rust occurred. The pathogen had adapted, and the resistance of LCP 85-384 was no more. Maintaining a mix of varieties and not planting too much of the area to any one variety can reduce overall rust severity in an industry and may increase the longevity of varietal resistance. When it is necessary to replace a variety in a vegetatively propagated crop like sugarcane with a multiple year crop cycle, the process takes years to accomplish. LCP 85-384 is still in the process of being replaced. How long rust resistance will last in the replacement varieties is uncertain. Considering the potential problems with resistance, it would be very helpful to have another option for disease management.

Foliar diseases caused by fungi are controlled with fungicides in many different types of crops. This control option has not been successfully exploited for any foliar sugarcane disease. Research currently being conducted in Louisiana suggests that control of rust with fungicides may be economically feasible. Different types of fungicides are now available. Some strobilurin and triazole fungicides have shown the ability to reduce brown rust severity and increase sugarcane yield. Combinations of fungicides with two different modes of action appear to provide the best control. It appears likely that multiple fungicide applications would be needed when a severe epidemic occurs. Despite this, it appears that the economic return to farmers may be greater than the expense of treatment. Another economic issue is that labeling fungicides for use in a crop is an expensive process. Chemical companies must decide that the potential use market for a fungicide is sufficient to commit company resources to the labeling process.

It is not yet certain what is going to happen in Louisiana, but it is possible that fungicides may represent a viable alternative method for rust control. Research on fungicide efficacy for brown rust control also is going on in some other countries. Use of resistant varieties will always be the most economical option for farmers, but fungicides might allow the recovery of some of the losses caused by rust at those times when this cyclical disease problem has found a way to successfully attack current varieties.

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