

Corn Kernels

Corn Information for North Carolina Corn Growers

Vernon G. James Research and Extension Center, Plymouth, NC 27962

Alert: Potential for Southern Rust on Corn in North Carolina

Dr. Steve Koenning – Plant Pathology Extension Corn Specialist and

Dr. Ronnie Heiniger – Crop Science Extension Corn Specialist

North Carolina State University.

What is Southern Rust?

Southern Rust (*Puccinia polysora*) is a particularly aggressive fungal disease of corn that is well adapted to warm, humid or wet environments. Since the fungus cannot survive cold conditions it is commonly found in areas around the equator (Columbia, Venezuela, and the Caribbean) where it can survive the winter. During the summer the disease moves via wind-blown spores to the northern latitudes where corn is more commonly grown. Southern Rust can be recognized by the bright orange or golden brown, circular to oval pustules that give leaves a rusty appearance (Figure 1). The pustules are about the size of a pin head and are filled with powdery masses of orange spores that are readily dislodged and blown in the wind. Thanks to these spores, Southern Rust can spread quickly. Ordinarily Southern Rust of corn is of little concern to North Carolina growers because spores arrive so late in the season that little or no impact on yield occurs. However, every few years a perfect set of conditions allows the disease to develop earlier than normal. Such was the case in 2003 when unusually wet weather and a late planted corn crop resulted in widespread infestation of Southern Rust in North Carolina in mid to late July. Early warm weather and moist conditions have helped set the stage for an early infestation in North Carolina. Already Southern Rust has been found in several fields in Lenior and Wayne Counties.

What Makes Southern Rust such a Concern this Year?

There are several factors that make Southern Rust a real concern for corn growers in 2014. First, the early



Fig. 1. Southern Rust on ear leaf in North Carolina in 2003.

warm temperatures have helped the disease move toward North Carolina earlier than usual. This movement has been aided by hurricane Arthur. Second, the moist conditions as of July have created an ideal environment for the disease in North Carolina. Any spores that are blown northward will find a home in

North Carolina corn fields. Finally, an early infection of corn just after silking would do serious harm to the North Carolina corn crop. Southern rust is very aggressive. It only takes 5 to 10 days to go from the first signs of rust on the leaves such as shown in Figure 1 to complete leaf loss shown in Figure 2



Fig. 2. Loss of corn leaves caused by an infestation of Southern Rust in North Carolina in 2003.

Needless to say leaf losses shown in Figure 2 would result in SEVERE yield declines (or complete crop loss) if this disease infects a corn field just after silking.

How Effective are Fungicides Against Southern Rust?

Experiences fighting Southern Rust in 2003 showed that once the fungus infects the leaf and starts producing large numbers of spores it is very difficult to stop this disease with fungicides. Maximum rates of Tilt and Quadris only slowed the infestation down for a few days. While the number of fungicides for corn have increase substantially since 2003 there is no evidence that these newer fungicides will be any more

effective at stopping or reversing an infestation that has already begun. The key to control of Southern Rust is to prevent the early spores from infecting the leaf thus avoiding further producing of spores. In other words the same strategies that are being promoted for Soybean Rust apply to Southern Rust in corn. It is important to treat PRIOR TO the first spores reaching the field.

What Should North Carolina Corn Growers do to Prevent Southern Rust from Destroying the Corn Crop in 2014?

Corn growers should do the following:

1. Keep a sharp eye on your corn crop and the neighbors corn. Scout your fields for Southern Rust. Southern Rust differs from Common Rust in that pustules are found on the upper sides of the leaf rather than on both sides as found in Common Rust (Figure 3) and the pustules are more orange compared with the reddish pustules found in Common Rust. If growers see southern rust in their field or nearby fields they should IMMEDIATELY arrange to spray corn with a strobilurin fungicide (Headline, Quilt, Quadris, Stratego etc.) We will be alerting extension agents of potentially hazardous conditions and they will help pass information along to you in advance. The current status of Southern rust in the U.S. can found at <http://sbr.ipmpipe.org/cgi-bin/sbr/public.cgi>.
2. If Southern Rust does get into a field prior to the dent stage (R5) growers should treat aggressively with the best fungicides available at the highest rates. Contact your extension agent for help in recognizing Southern Rust, information on recommended fungicides and rates for treating an infestation of Southern Rust. However, if Southern Rust is found after R5 (dent) then treatment is no longer recommended as the crop should be able to reach maximum kernel weight even under severe leaf loss. Since it is virtually impossible to treat the entire statewide corn crop in a timely manner given the aerial and ground resources in North Carolina growers are

encouraged to take proactive steps to protect their crop as much as possible. This means spraying a strobilurin fungicide at R1 (50% of corn ears with brown silks) to R2 (blister stage). This is a good strategy because it provides ten days to two weeks of protection which would at least get the crop close to the dent stage at which time the loss of leaf area would have less impact. With the excellent corn crop that most growers have treating with a fungicide at this stage has other benefits (better light utilization and protection from other diseases) which would pay for the treatment. In other words you get the insurance benefit of early protection against Southern Rust while having it paid for by increases in yield. Since when have you bought insurance and had it pay for itself?



Fig 3. Pustules of Southern Rust on the upper surface of a corn leaf.

It is important that growers recognize the seriousness of this situation and take all precautions to avoid early infestation of Southern Rust. This is a year when a little prevention will go a long way and given the fact that fungicides can be beneficial to a good or excellent crop the use of a fungicide at R1 to R2 is recommended.

What if a Grower has Already Applied a Fungicide Prior to R1?

There is no known data about the efficacy of fungicides applied prior to R1 (V5 to VT) on Southern Rust. Given the nature of this disease and the persistence of fungicides in the plant it is doubtful that applications of fungicides prior to R1 will be effective against Southern Rust. Therefore, the recommendation is that growers either consider a second fungicide application after R1 or be especially aware of the potential for infestation and take steps to apply a second application of a fungicide if the conditions warrant. While it may cost more to make a second fungicide application the cost is well worth the protection. In 2003, as many as three applications of different fungicides were used to slow the spread of Southern Rust. Harvest data indicated that the yield saved paid for all three of the applications. This just shows how important it is to prevent this disease from gaining a foothold in your field.