



June 11, 2012

Southern rust alert – last Thursday (June 7), southern rust was found in a single field of corn in southwest Georgia. At the time of writing this newsletter, I have not seen or heard of any southern rust in south Alabama or the Florida Panhandle, but growers in these areas should be on alert!

Southern rust is a very aggressive foliar disease that has the potential to kill a whole field of corn in 7-10 days when environmental conditions are favorable. Most years, we don't see southern rust until mid- to late July, and it is of no consequence since corn is close to black layer or physiological maturity. Occasionally, southern rust will come in early as it did this year. It is believed that the southern rust found in southwest Georgia blew in as spores from tropical storm Beryl, since the disease overwinters in the tropics. Southern rust development is favored by warm, humid conditions like we are currently experiencing. A new race of southern rust was identified a few years ago in which no hybrids currently on the market have complete resistance. It is not yet known at this time if this is the old race or new race. Below is a picture of southern rust with descriptive bullet points to help with identification. Please monitor your fields every couple of days so you can weigh the importance or need for a fungicide application.

Southern rust identification:

- Round to oval-shaped pustules are light brown to orange in color and typically appear on the upper leaf surface only, but may occasionally appear on the lower leaf surface.
- Pustules usually accompanied by a yellow halo
- Pustules may be found on stalk, husks and leaves.



At what stage is the corn crop safe from southern rust? Currently there is not enough research data to answer this question with complete certainty, so we must fall back on some facts to help answer this question.

Fact 1: When corn first begins to dent, the corn plant still has three weeks before reaching black layer or physiological maturity, so there is plenty of time for southern rust to explode.

Fact 2: At first dent, only about 65 to 70 percent of final yield has been achieved.

Fact 3: Purdue University Yield Loss Study

Stage of Corn Plant	Yield Loss from Death of Leaves Only	Yield Loss from Death of Whole Plant
Soft dough	35%	55%
Full Dent	27%	41%
½ Milk Line	6%	12%

Fact 4: Severe loss of leaf area from southern rust may cause the plant to cannibalize carbohydrates from the stalk in order to fill out the ear, and thus, possibly induce severe stalk lodging!

Considering the above yield and lodging facts, I would suggest that corn with a high yield potential is not safe from southern rust until the ¼ to ½ milk line (15 to 10 days from black layer).

After corn silks have turned brown, corn growth is characterized by a period of rapid dry matter accumulation in the kernel. The cob has reached its full length and diameter by the roasting-ear stage. Almost all of the potassium and 70 percent of the nitrogen and phosphorous needed by the corn plant has been taken up from the soil. Some kernel development facts follow on the next page.

1) **Blister Stage** - This stage occurs 10 to 14 days after silking. The kernel is white in color and resembles a blister. It contains a clear inner fluid in which the developing embryo can be seen. Starch has just begun to accumulate and the kernel is beginning its dry matter accumulation or seed fill period. The kernel is about 85 percent moisture at this time.

2) **Milk Stage** - This stage is characterized by a yellow kernel color and the inner fluid is milky white. The milk stage occurs approximately 18-22 days after silking. The embryo can now be easily seen and the kernel is at about 80 percent moisture. This is also known as the roasting-ear stage.

3) **Dough Stage** - The inner fluid in the kernel has now turned into a paste or dough like material due to accumulated starch formation. The kernel is about 70 percent moisture and has accumulated about half of its mature dry weight. This stage occurs about 26 days after silking.

4) **Dent Stage** - This stage occurs about 35-42 days after silking. All or nearly all the kernels will be dented at the top of the kernel as a result of the starch beginning to dry down at the top of the kernel. This hard layer of starch will continue to advance toward the cob. Silage producers often refer to the boundary between the hard starch and soft starch as the milk line and use it as an indicator to signal silage harvest. Kernels will be at about 55 percent moisture in the dent stage.

5) **Physiological Maturity** - This stage is often referred to as the black layer. Black layer formation occurs when the kernels have attained maximum dry weight. If one scrapes the tip of the kernel on the side opposite the germ side, a black layer will be seen when physiological maturity has been reached. Black layer occurs about 55 to 65 days after silking and kernel moisture is approximately 35 percent.

Hail damage in soybeans – Soybeans have a tremendous capacity to compensate from hail damage. Studies simulating hail damage show that a 50 percent leaf loss at the V-6 stage (6th node) reduces yield approximately 3 percent. The stem apex (tip growing point) exhibits dominance over the axillary buds or axillary growing points. If the stem apex is severed off with part of the stem, the remaining axillary buds may be released from dominance and branches may grow profusely. However, severing the plant below the cotyledonary node will kill it. Also, if the main stem is ruptured on the majority of plants, replanting would be advised, as a ruptured stem interferes with the water conducting tissue.

Planting soybeans in hot soil conditions. Quite often, temperatures in the sandy soils of south Alabama and the Florida Panhandle reach 120 F in late June and July. Please be aware that soybean emergence may decrease significantly when soil temperatures are above 100 F. If you have irrigation, it would be best to irrigate late in the the day and then plant early the next morning in order to achieve cool soil temperatures or else plant shortly after a rain once the soil has cooled.

Sincerely,

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