Managing Southern Rust of Corn

Life Cycle and Favorable Conditions
Southern rust is typically found in tropical to sub-tropical regions where the fungus *Puccinia polysora* thrives in hot, humid climates. The pathogen is known to overwinter in southern Florida, the Caribbean, and Mexico, requiring a live host to survive. Southern rust can be transported north each growing season by winds and storms, particularly weather fronts moving northward from the Gulf region. Since the fungus does not overwinter in field locally, the occurrence of the disease will always depend upon wind dispersal of the pathogen, thus infection one year does not indicate that southern rust will occur the following year.

Southern rust development is favored by high humidity and warm temperatures (between 80° and 90° F for development). When temperatures are favorable, new infections are visible within 10 to 14 days. Epidemics may occur when weather patterns lead to mass air movements from regions where southern rust is common.

Symptoms
Southern rust pustules develop primarily on the upper surface of the corn leaves, with only a few pustules present on the lower leaf surface (Figure 1). Unlike common rust, southern rust pustules may also develop on ear, husks, and leaf sheath tissues surrounding stalks. These pustules are circular to oval in shape. The pustules will eventually erupt to expose small, dust-like, light orange-colored spores. These spores are easily dispersed by wind and cause new secondary infections. It is also important to note when scouting, southern rust and common rust may be present on the same plant (Figure 2).

Damage
Southern rust can develop and spread rapidly throughout an area, which may result in yield loss if substantial amounts of leaf tissue are infected. The effect of southern rust on corn plant health and yield depends on when the plant becomes infected and the severity of infection. When a plant is infected early in the season leaf tissues may be severely damaged. Heavy infections of southern rust can lead to early senescence and can limit carbohydrate production for grain fill. Stalk cannibalization may occur, causing the plant to be predisposed to lodging, stalk rots, and reduced grain quality.

Once southern rust is identified within a region the most susceptible fields should be scouted first. The disease may first affect fields that are planted late.

Key Points
- Southern rust is a fungal disease that is very similar to common rust, but subtle differences can help correctly identify the disease.
- Southern rust is more commonly found in the southern U.S., but can spread into the Midwest by wind dispersal of spores.
- Yield loss can be severe, especially in southern regions in late-planted corn, and in low-lying fields.

Figure 1. Southern rust pustules covering leaf.

Figure 2. Corn leaf infected with both common rust and southern rust.
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or are more prone to moist conditions such as irrigated or low-lying fields. Late-planted fields are at risk for developing more severe infections of southern rust because young leaves are more susceptible than older leaves. Irrigated or river bottom fields are more likely to have the high humidity required by southern rust to infect corn. When scouting for southern rust, determine the growth stage of the corn and yield potential to help evaluate whether or not a fungicide applications is an economically feasible option.

Management

Corn products with resistance to southern rust should be considered for planting. Resistant products are the most cost-effective means of managing southern rust in field corn.

Chemical control may be advised if southern rust is already identified in a field in which the corn will not reach black layer for four or more weeks and the weather forecast is for hot, humid conditions. Before applying a fungicide also consider the following:

- Corn that is within two weeks from black layer may not benefit from a fungicide treatment.
- A corn crop with an estimated yield potential of less than 150 bushels/acre may not provide a profitable return from a fungicide application.
- Fungicide applications may increase yield potential if more than 10% of the leaf area is damaged.
- Fungicide control is preventative rather than curative.

By applying a fungicide, the health of infected leaf tissue will not be restored; however, the fungicide can prevent new tissues from becoming infected. This means all fungicide applications must be made before southern rust develops to severe levels.

Please consult with your local agronomist if you have concerns about southern rust in your fields, and review university recommendations for fungicide application timing.

Sources:

Table 1. Differences between southern rust and common rust.

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<thead>
<tr>
<th></th>
<th>Southern Rust</th>
<th>Common Rust</th>
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<tbody>
<tr>
<td>Development</td>
<td>Rapid and more destructive</td>
<td>Slow and less destructive</td>
</tr>
<tr>
<td>Location of pustules</td>
<td>Mostly on upper leaf surface</td>
<td>On upper and lower leaf surfaces</td>
</tr>
<tr>
<td>Fungus</td>
<td><em>Puccinia polysora</em></td>
<td><em>Puccinia sorghi</em></td>
</tr>
<tr>
<td>Favorable conditions</td>
<td>80° to 90° F and high humidity</td>
<td>60° to 77° F and RH ≥ 95%</td>
</tr>
<tr>
<td>Pustules (lesions)</td>
<td>Small; Densely clustered; Circular to oval shape; Light orange in color</td>
<td>Large; Sparsely scattered; Elongated shape; Brick red in color</td>
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</tbody>
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Image

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