

## Corn and Grain Sorghum Promotion Board 2015 Report

**Title:** Management of southern rust (SR) with emphasis on threshold-based crop protection.

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**Objectives:**

1. Evaluate rust severity thresholds for timing of a fungicide to manage SR.
2. Evaluate the effectiveness of new and commercially available fungicides to control SR.
3. Determine the importance of eastern gamagrass in the overwinter survival of SR.

*Objective 1:* Field trials were conducted along the Arkansas River in Jefferson Co to evaluate fungicide control of southern rust at various levels of rust severity. The corn hybrid Agventure R9583 was planted on 25 May. Southern rust was observed at trace levels (1-2 pustules on ear leaf in the field) at VT. Environmental conditions were favorable for southern rust and by R1 the disease severity had reach 1% on the ear leaf of plants in the plot. Tilt and Quilt Xcel were applied at VT and R1 (14 d after VT) at low rates.

There are two conclusion based on the results of this trial. First, Tilt was less effective than Quilt Xcel suggesting strobilurin fungicides are more effective at southern rust control, even after disease development. Thus, future recommendations on southern rust control will recommend a strobilurin fungicide as premix or tank mix rather than triazole alone. Second, Quilt Xcel applied at 1% disease severity up to and including the R2 growth stage was effective at significantly suppressing southern rust 42 days after treatment compared to the NTC (Fig. 1). This suppression of southern rust contributed to a significant yield response of 36 bu/A over the NTC (144 bu/A), which was comparable to the application at VT when only a trace amount of southern rust was detected in the field (Fig. 1). Thus, fungicides applied after southern rust has development up to and including R2 stage of growth can be profitable when conditions favor southern rust development and corn has good yield potential.

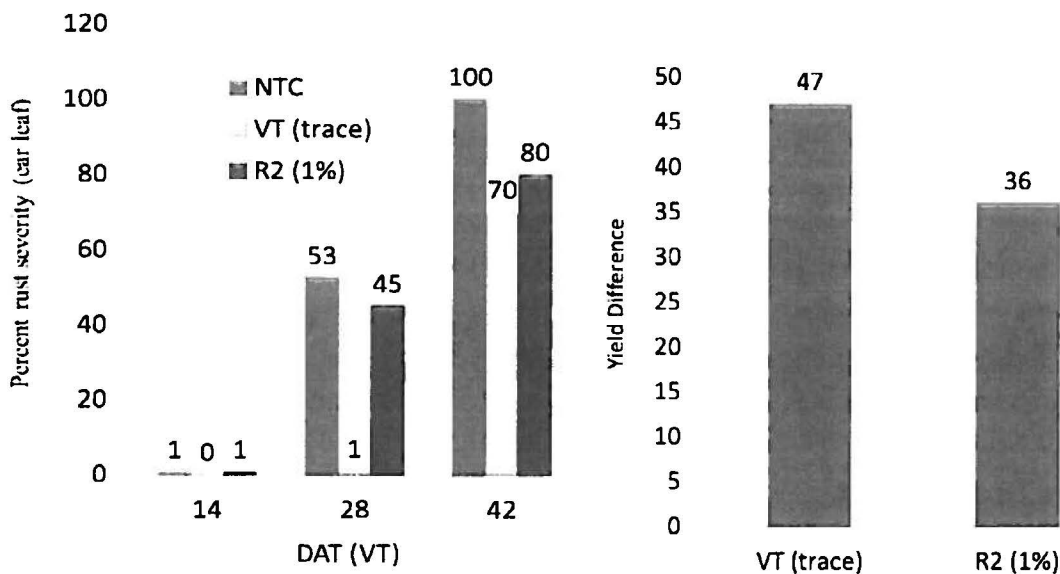


Figure 1. Southern rust severity at 14, 28 and 42 days after VT treatment (left) and yield difference in treatment thresholds with Quilt Xcel over then NTC.

*Objective 2:* Several trials were conducted to evaluate new and commercially available fungicides to control southern rust. Of the commercially available fungicides Quilt Xcel and Fortix are among the most consistent fungicides tested over the past few years, which are nearly always significantly higher than Affiance and Priaxor. The other fungicides are sometimes comparable to both the VG and G group.

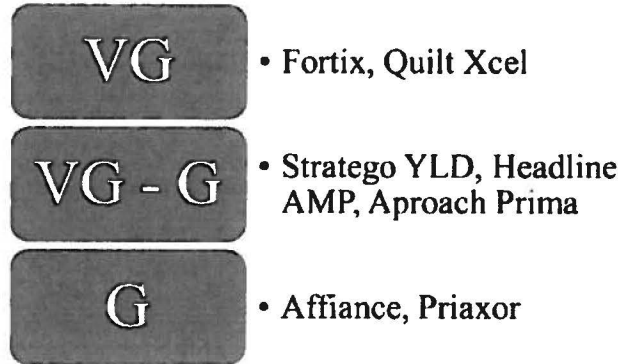


Figure 2. Ranking of commercially available fungicides based on 2015 trials.

A new fungicide that will be available in 2015 called Trivapro was very effective at controlling southern rust (Fig. 3). It is a combination of Quilt Xcel and an SDHI fungicide (solatenol). Yield protection contributed to 43 bu/A over the NTC (154 bu/A). This yield protection was also significantly higher than that of Priaxor D (29 bu/A), Aproach Prima (28 bu/A) and Strateto YLD (6 bu/A). The two-way fungicides did not contribute to a significantly higher yield over the NTC. Future studies are needed to confirm the efficacy of Trivapro, but based on these data it appears to be a very effective southern rust fungicide with a long residual activity (28 days after treatment).

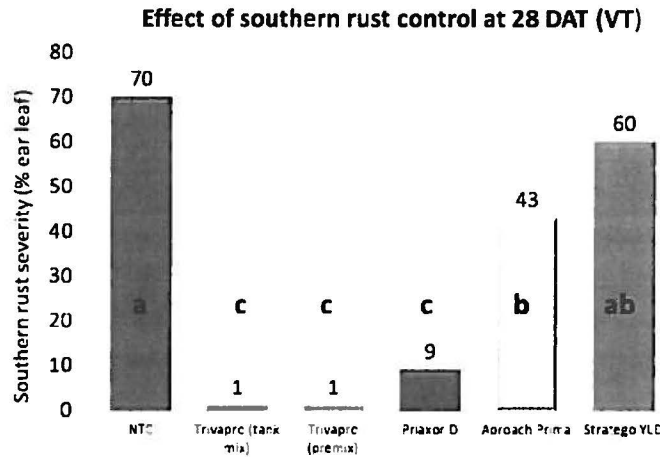


Figure 3. Effect of Trivapro on suppression of southern rust severity on corn ear leaf. Different letters over bars indicate a significant difference at  $\alpha = 0.05$  according to Tukey's HSD

*Objective 3:* Based on our data eastern gamagrass is not a suitable host for southern rust and is not a threat as an overwinter host or contribute to higher inoculum levels during the cropping season. Though eastern gamagrass was the first host to confirm the presence of southern rust in the US, it does not appear to be a virulent pathogen on the perennial grass.