Effects of fluopyram on soybean sudden death syndrome and soybean cyst nematode

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Introduction

Soybean sudden death syndrome (SDS) and soybean cyst nematode (SCN) are among the most harmful diseases on soybeans. Currently, resistance is the main management strategy for both diseases, though there are few other options available for each disease. A recently registered seed treatment, fluopyram (ILeVO® Bayer CropScience), is available and has been reported as having activity against both SCN and SDS.

Objective

Assess the effect of fluopyram on SDS and SCN development

Methods

- 4 varieties with variable resistance to SCN
  - resistant (<10% reproduction), moderately resistant (10-30%), moderately susceptible (31-60%) and susceptible (>60%)
- 7 seed treatment combinations
  - red colorant (control)
  - Trilex®-Allegiance®
  - Trilex®-Allegiance®-ILeVO®
  - Trilex®-Allegiance®-VOTiVO®
  - Trilex®-Allegiance®-Poncho®
  - Trilex®-Allegiance®-Poncho®/VOTiVO®
  - Trilex®-Allegiance®-Poncho®/VOTiVO®-ILeVO®
- Challenged with pathogens separately and in combination
- Tested in temperature controlled water baths at 24 to 27 degrees C in a greenhouse
- Data collected
  - SDS foliar symptom rating (%)
  - SDS root rot rating (%)
  - Number of SCN females
  - Number of SCN eggs
  - Root mass (g)

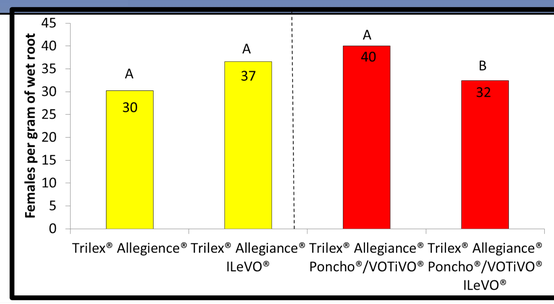

Figure 1. Contrasts of the mean number of females per gram of wet root mass between two pairs of seed treatments with and without ILeVO® across three runs of an experiment with SCN alone at 27 degrees C. Overall ANOVA P<0.05.

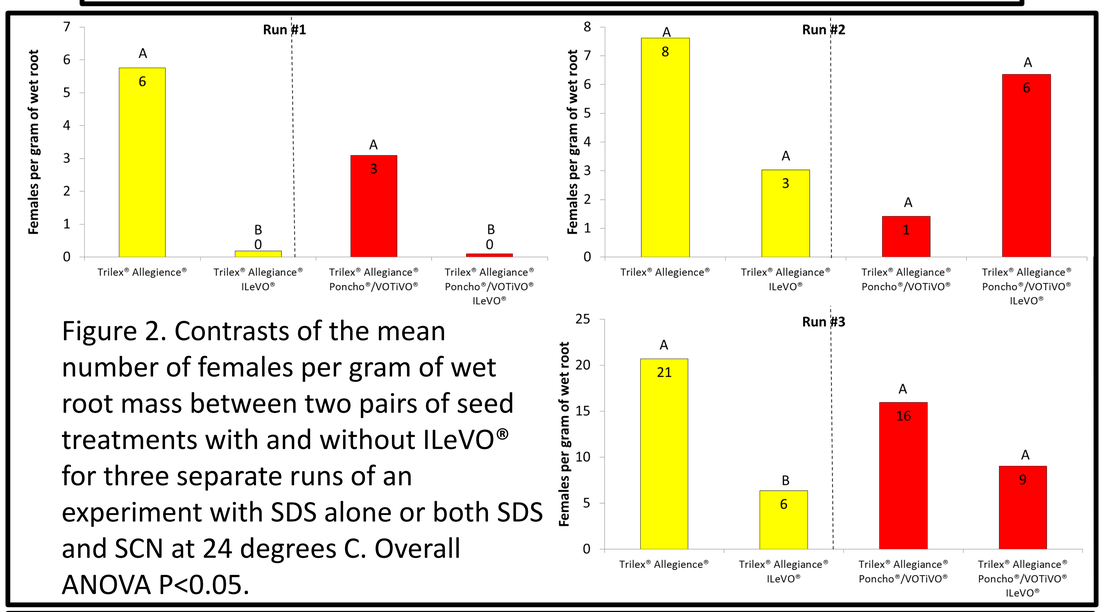

Figure 2. Contrasts of the mean number of females per gram of wet root mass between two pairs of seed treatments with and without ILeVO® for three separate runs of an experiment with SDS alone or both SDS and SCN at 24 degrees C. Overall ANOVA P<0.05.

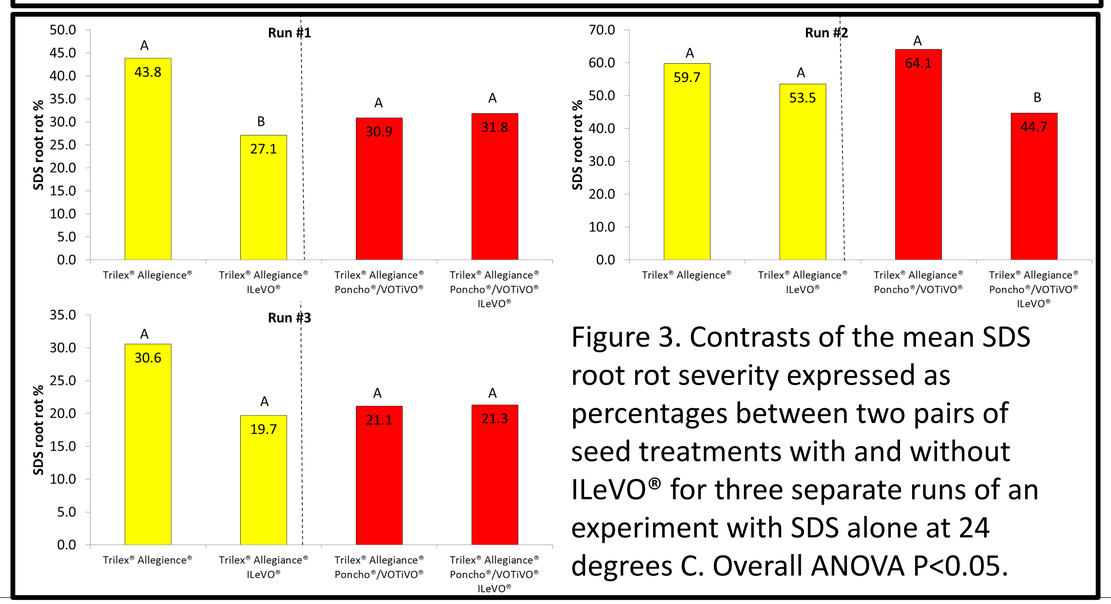

Figure 3. Contrasts of the mean SDS root rot severity expressed as percentages between two pairs of seed treatments with and without ILeVO® for three separate runs of an experiment with SDS alone at 24 degrees C. Overall ANOVA P<0.05.

Results

- ILeVO® with Trilex®, Allegiance® and Poncho®/VOTiVO® reduced the number of SCN females per gram of wet root 20% in the experiment with SCN alone (Figure 1).
- In experiments with both SDS and SCN, there was zero SCN reproduction on plants treated with ILeVO ® for run #1; a 71% reduction for the contrast of ILeVO® with Trilex® and Allegiance® in run #3; and no significant reductions for run #2 (Figure 2).
- There was largely no effect of ILeVO® on SDS foliar symptoms .
- There was a reduction of 38% in SDS root rot severity for plants treated with ILeVO®, Trilex, and Allegiance; a 30% reduction for plants treated with ILeVO®, Trilex®, Allegiance® and Poncho®/VOTiVO® for run #2; and no significant reductions for run #3 (Figure 3).

Conclusions

- Results were inconsistent across experimental runs, however, there may be a negative effect of fluopyram on SCN alone and in the presence of SDS.
- There does not appear to be an effect of fluopyram on SDS foliar symptoms, but it possibly may reduce root rot severity.
- Artificial greenhouse conditions may not adequately simulate field conditions for the purposes of studying SDS foliar symptom development.

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