ABSTRACT
A spray track was designed and built to conduct replicated laboratory and field studies to compare different nozzle configurations on the ability of each to achieve lower canopy spray coverage. Twenty nozzle types were compared in the lab and twelve nozzle types were compared in the field trials.

RESULTS—Lower Canopy
A spray track was designed and built to conduct replicated laboratory and field studies to compare different nozzle configurations on the ability of each to achieve lower canopy spray coverage. Twenty nozzle types were compared in the lab and twelve nozzle types were compared in the field trials.

PROCEDURES
A spray track machine simulated actual field spraying conditions facilitating multiple treatments and replications. Potted soybean plants were arranged in a dense canopy representing a drilled soybean field. The 24" soybean plants were in the growth stage R1 to R2; estimated canopy fill over 90%.

CONCLUSIONS
Differences in PAC between the two experiments is attributed to a 20% difference in canopy density (lab = 95% - field = 75%).

INTRODUCTION
A challenging aspect of combating crop disease is the lack of practical experience in making fungicide applications into dense crop canopies such as soybean during the growth stages where a disease such as Asian Soybean Rust may strike. Experience with disease control in heavy canopies would indicate that getting the spray droplets to penetrate into the canopy would be beneficial to achieve the best coverage and improved efficacy.

OBJECTIVE
The objective of these experiments was to conduct laboratory and field trials to compare ground sprayer nozzle options for applying fungicides to obtain the most coverage in the lower parts of the soybean canopy.

OUTLINE
- ABSTRACT
- RESULTS—Lower Canopy
- PROCEDURES
- CONCLUSIONS
- INTRODUCTION
- OUTLINE

Examples of nozzles used in the trials.

- Laboratory and Field Treatment Means for Percent Area Coverage (PAC) and Droplets per square centimeter (D/C²).

- Different letters indicate significance at alpha = 0.10.

- The lab treatments had a range for PAC from 5.1 to 1.6% (LSD=2.29) with no significant differences in the top 15 nozzle treatments.

- The TT11006 sprayed at 50 PSI and the TD11004 at 115 PSI tied for first in PAC. The top four were single nozzle orifice designs.

- The average PAC for single nozzle designs was 3.75% compared to the double nozzle designs at 3.11%.

- Significant differences were found with percent area coverage (PAC) comparisons ranging from 5.1 to 1.6% (LSD=2.29) with no significant differences in the top 15 nozzle treatments.

- The D/C² ranged from 145.5 to 75.5 with no apparent correlation to PAC.

- The TT11006 at 50 PSI and the TD11004 at 115 PSI tied for first in PAC. The top four were single nozzle orifice designs.

- Single nozzle designs on average provided more coverage in the lower canopy.

- In the field trials the D/C² ranged from 43 to 12 (LSD=23.25). The TT11004 sprayed at 95 PSI had the most droplets deposited.

- In both experiments the single nozzle designs on average provided more coverage than the double nozzle designs.

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- Significant differences were also found with number of D/C² with the TT11004 at 95 PSI at the highest (43).

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- Articulated nozzle configurations at higher pressure averaged more lower canopy penetration than the venturi nozzle designs at higher pressure.

- Application volume – 20 GPA.
- Water and NIS @ .5% v/v.
- Boom Speed – 10 MPH.
- Flow rate required – 0.67 GPM.
- Droplet size goal – 200-300 VMD.
- Water, NIS, and Headline.
- Application Speed -10 MPH.
- Flow rate required – 0.67 GPM.
- Droplet size goal – 200-300 VMD.
- Water sensitive papers were placed in the lower canopy at a height of 4 inches from ground with 6 wsp per treatment.
- DropletScan™ used to analyze droplets.

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