INTRODUCTION
Control of Asian soybean rust will require a fungicide application during the reproductive stages. Most soybean in the Mid-Atlantic region is planted in narrow row spacing. Therefore, unless tram lines are established, one or two soybean rows will be damaged by the sprayer tires. The impact of sprayer traffic on reproductive-stage soybean yield has not been fully investigated. Furthermore, planting date, row spacing, and environment may influence the extent of yield loss.

OBJECTIVE
The objective of this research was to determine the yield loss caused by sprayer traffic to R4- (late pod) to R5- (early seed) stage soybean planted in three row widths and two planting dates.

MATERIALS & METHODS
Soybean was planted in May (Suffolk, VA), early June (Georgetown, MD), and late June (Suffolk). The late-June planting followed wheat harvest. Three row spacings were used: 7.5, 15, and 30 (Delaware) or 36 (Virginia) inches. Traffic and fungicide (with or without Quadris® azoxystrobin) treatments were applied at the R4 to R5 development stage. This is the stage that we felt rust would most likely occur in the Mid-Atlantic region. The experimental design was a split-strip-plot with row spacing as the main plot, traffic treatment as the vertical treatment, and fungicide as the horizontal treatment. Plot size was 12 x 17 feet. Each treatment was replicated four times.

Data were subjected to analysis of variance using the PROC MIXED procedure of SAS. Means were separated using Fisher’s LSD. Percent yield reductions were calculated based on sprayer width.

RESULTS
Delaware experiments had not been harvested at this time; therefore only Virginia data are presented. Fungicide had no effect on yield; data are averaged over fungicide treatment. Traffic treatments destroyed four of sixteen 7.5-inch rows and two of eight 15-inch rows in the plot (25% of total harvested area). No rows were destroyed in the 36-inch row spacing. In 2005, traffic reduced May-planted soybean yield 13 and 20 percent per plot in the 7.5 and 15-inch rows, respectively. In June-planted soybean, yield was reduced 29 and 25 percent per plot in 7.5 and 15-inch rows, respectively.

In 2006 at the Suffolk location, May-planted soybean yield was lowered by 13 and 20 percent per plot in the 7.5 and 15-inch row spacing, respectively, by tire traffic. June-planted soybean yield was lowered 29 and 25 percent per plot in 7.5 and 15-inch rows, respectively, by tire traffic. Depending on sprayer width, cropping system, row spacing, and environment, soybean yield would be lowered from 1 to 3 percent by sprayer tire traffic.

DISCUSSION
From these data, there appears to be yield compensation from adjoining soybean rows, except for the 2005 double-crop experiment. The amount of compensation was dependent on environment and row spacing. In the full-season system, the 7.5-inch row spacing was able to compensate more than the 15-inch rows. This was not always the case for the double-crop system. Both years experienced drought during August. However, abundant rainfall occurred during September through October. This weather pattern tended to favor double-crop systems as those soybean did not enter the seed filling development stages (R5-R6) until after soil moisture conditions improved. Seed weight (seed size) data were collected and should reveal more information regarding environmental and row spacing effects on yield compensation.

Although traffic damage did not occur in the wide row spacing, yield was much lower; negating the benefits of planting in wider rows. Intermediate row spacing (20-24 inches) would not likely be damaged and may not result as large of a yield reduction.

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