PROGRESS REPORT
TO
NORTH CAROLINA PEANUT GROWERS ASSOCIATION, INC.

TITLE: **Reduced Cost Sclerotinia Blight Management with Fungicides and Disease Risk Prediction**

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REPORT:

Sclerotinia blight is one of the three most important peanut diseases in North Carolina. The primary product for Sclerotinia blight control (Omega) is very expensive, costing between about $50 and $75 per spray, depending on the application rate. In previous tests, the group 7 fungicide Fontelis applied at 1.5 pints per acre reduced the incidence of Sclerotinia blight by about one-third. The level of control attained often was statistically equal to control from Omega at 1 pint per acre. Fontelis is primarily used to control stem rot and leaf spot. For these diseases, a rate of 1 pint per acre is recommended. No suppression of Sclerotinia blight was observed with Fontelis at the 1 pint per acre rate in previous trials.

In many seasons, the final leaf spot spray in early September coincides with a period of rapid Sclerotinia blight development. This presents a trade-off between the need for resistance management with Bravo sprays and Sclerotinia blight control since Bravo can make Sclerotinia blight worse. Using Fontelis as the final leaf spot spray could control leaf spots and control or suppress Sclerotinia blight.

Another means of reducing the cost of Sclerotinia control is to identify problem fields so that they could be avoided. A soil assay for the Sclerotinia fungus could identify risky fields, but the currently available methods are much too time consuming to be used for grower recommendations. New advances in molecular methods for identifying and quantifying pathogens from soil (real-time PCR) may make routine assays for Sclerotinia possible. However, we first need to have a better understanding of the relationships between the amount of the pathogen in soil and the amount of disease that develops. This will help us to set detection thresholds and determine the level of precision needed from a new assay.

Objectives

- The main objective of this research was to devise efficient fungicide programs for the control of Sclerotinia blight.
- This research also seeks to develop methods that could be used to identify high-risk fields so that growers can plan Sclerotinia blight management programs more effectively.

Methods

Experiment 1. This experiment was designed to compare Sclerotinia control by Omega or Fontelis applied in different sequences (Table 1). The experiment was conducted at the Upper Coastal Plain Research Station. The 4-row plots were planted with the cultivar Bailey and the treatments were replicated 6 times in a randomized complete block design. The first spray (Omega or Fontelis) was applied on demand, on August 22. A second spray was not applied because harvest was projected to occur within 30 days of the scheduled spray date of September 12. This resulted in 12 replicate plots and three treatments. Plants infected with Sclerotinia blight were marked with surveyor's flags and counted. Disease was assessed on August 8 (no disease), August 20, and September 20. Plots were dug on October 17 and harvested on October 25, 2013.

Experiment 2. This experiment was conducted to determine if spraying a high rate (1.5 pints/a) of Fontelis as part of a leaf spot and stem rot control program will provide Sclerotinia blight control alone or in combination with a single Omega application at the high or low rate (Table 2). The Omega treatments were applied according to the North Carolina Sclerotinia blight advisory. The experiment was conducted at the Peanut Belt Research Station in 4-row plots planted with the cultivar Bailey. Treatments were replicated 6 times in a randomized complete block design.

Table 1. Proposed timing of Fontelis and Omega applications in experiment 1. The second spray was not applied due to late onset of the disease.

First spray	Second spray
Omega	none
Omega	Omega
none	Omega
Fontelis	none
Fontelis	Fontelis
none	Fontelis
Omega	Fontelis
Fontelis	Omega
none	none

Table 2. Treatments in experiment 2 examining the effect of Fontelis used for foliar disease control on control of Sclerotinia blight

	Program and application dates				
Rate of Omega	**Foliar program**	**July 17**	**July 31**	**Aug 15**	**Sep 12**
None	Fontelis 1.5 pt	Provost 10 oz	**Fontelis 1.5 pt**	Provost 8 oz	**Fontelis 1.5 pt**
None	No Fontelis	Provost 10 oz	Headline 9 oz	Provost 8 oz	Bravo
1 pint/a	Fontelis 1.5 pt	Provost 10 oz	**Fontelis 1.5 pt**	Provost 8 oz	**Fontelis 1.5 pt**
1 pint/a	No Fontelis	Provost 10 oz	Headline 9 oz	Provost 8 oz	Bravo
1.5 pint/a	Fontelis 1.5 pt	Provost 10 oz	Fontelis 1.5 pt	Provost 8 oz	Fontelis 1.5 pt
1.5 pint/a	No Fontelis	Provost 10 oz	Headline 9 oz	Provost 8 oz	Bravo

Soil assay for Sclerotinia blight inoculum. Soil samples were collected at digging (October 25) from all plots of experiment 1 at Rocky Mount. Twelve additional samples were collected from Dr. Isleib's Sclerotinia nursery, which was located adjacent to experiment 1. Disease data from the nursery indicated a gradient in disease pressure running diagonally through the field. The samples were air dried and will be processed by the conventional method of elutriation followed by plating on agar medium. The results will be compared to disease data from the trial to determine if soil inoculum levels were indicative of the disease that developed.

Results from 2013.
Experiment 1: In spite of favorable weather for Sclerotinia blight early during much of the 2013 season, disease was much less severe than expected. Only one fungicide application was made in experiment 1 due to the late onset of disease. Thus, the experiment compared a single application of Omega at 1 pt/A, a single application of Fontelis at 1.5 pt/A, and no fungicide. Disease appeared to be greater on average in untreated plots than in others, but differences could have been due to chance. However, both fungicides increased yield compared to the unsprayed control. Yields did not differ between the Omega and Fontelis treatments (Table 3).

Experiment 2: The experiment was conducted as designed but no Sclerotinia blight developed in the field selected for this experiment. The field selected had a history of disease, but Sclerotinia blight was across the PBRS in 2013 in spite of generally favorable weather. It is likely that the plots were located in an area of low inoculum. These results point up the need for better identification of high risk fields as described above.

Results from the soil assay are pending and will be reported by December 1.

Table 3. Effect of a single application of Omega or Fontelis on Sclerotinia development and yield of peanut in Rocky Mount in 2013

Treatment	Diseased plants/plot before treatment	Diseased plants/plot 4 weeks after treatment	Increase in diseased plants/plot after treatment	Total diseased plants/plot	Yield/A
Fonteils, 1.5 pt/A	3.5 **a**	17.3 **a**	13.8 **a**	20.8 **a**	5379.3 **a**
Omega, 1pt/A	4.1 **a**	16.7 **a**	12.6 **a**	20.8 **a**	5239.9 **a**
none	4.3 **a**	21.3 **a**	17.1 **a**	25.6 **a**	4715.0 **b**
LSD	*2.6*	*9.1*	*8.3*	*10.5*	*503.4*

IMPACT STATEMENT

Measurable Outcomes and Potential Impact

The outcome of this project will be more efficient control of Sclerotinia blight through the use of fewer and lower cost fungicide applications.