

## ***National Peanut Board - 2015 Final Report***

**Title:** Development of Disease Management Strategies for Peanut Production in Arkansas

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**Layman Summary:** There has been a renewed interest in peanut production in Arkansas. In anticipation that disease will be an important factor in sustaining peanut production we have taken a systematic approach to determine what diseases are present and how to best manage these diseases under our cropping system. Currently, there have been several diseases identified in the state including Rhizoctonia foliar blight, Rhizoctonia limb rot, southern blight, Sclerotinia blight, early leaf spot, and late leaf spot. Though our system would suggest Rhizoctonia foliar blight as an important disease, our research indicates it is more of a minor disease and may require little or no management practice. Sclerotinia blight caused by *Sclerotinia sclerotiorum* does not appear to be as aggressive as that of *S. minor*, so growers may not need to implement as an aggressive management program in fields where *S. sclerotiorum* is the causal agent of Sclerotinia blight. Further, some of the cultivars from Florida are more susceptible to Sclerotinia blight than those from Georgia. These projects are designed to answer some of the fundamental disease management questions by Arkansas peanut producers which are delivered to them directly at production meetings or on-line through our University of Arkansas Row Crops blog website.

**Objective 1: Determine how Rhizoctonia foliar blight impacts yield in peanut.** To evaluate the impact of Rhizoctonia foliar blight on peanut a field trial was conducted at the Newport Research and Extension Station (NRES) near Newport, AR. The peanut cultivar 'FloRun 107' was planted on 28 May at a seeding rate of 6 seed/ft of row. Plots consisted of two, 30-ft-long rows spaced 30-in apart. Plots were furrow irrigated and inoculated on 17 Aug. with 0, 50, and 100 ml of dry Rhizoctonia inoculum produced on millet seed. This was the best method used in 2014 for producing foliar blight symptoms on peanut. Weather conditions were warm, which favored Rhizoctonia foliar blight; however, no symptoms were in these plots. Based on these results and those from earlier trials Rhizoctonia foliar blight does not seem to be a yield limiting disease, therefore, appears to be a minor disease that will rarely need to be managed.

**Objective 2: Compare the aggressiveness and pathogenicity of *Sclerotinia minor* and *S. sclerotiorum* on commercial runner peanut cultivars.** To evaluate the impact of Sclerotinia blight on commercial peanut cultivars a field trial was established at the NRES. The peanut cultivars: Georgia 09B, Georgia 06G, Florida 07, FloRun 107, 727, and OLin (Spanish type), were planted on 28 May at a seeding rate of 6 seed/ft of row. Plots consisted of two, 30-ft-long rows spaced 30-in apart separated by a 10-ft fallow alley. The experimental design was a RCBD with four replications per cultivar. Plots were inoculated on 21 July with 50 ml of dry *Sclerotinia minor* inoculum per plot produced on sterile millet seed. Symptoms of Sclerotinia blight were observed in mid-September on all cultivars. Georgia 09B was less susceptible to Sclerotinia blight than Florida 07, FloRun 107, and 727. Among the runner cultivars (excluding OLin), there was a negative correlation ( $r = -0.48$ ,  $P = 0.015$ ) between Sclerotinia blight disease severity and yield. The two Georgia cultivars had the highest yield, but were not significantly higher than the Florida cultivars. Georgia 09B and Georgia 06G would be the preferred cultivars over

Florida 07 and FloRun 107 to be used in fields with a history of Sclerotinia blight in Arkansas. This is the first evaluation of cv. 727 and it does not seem to be a good fit in the Mid-South.

Table 1. Response of six commercially available peanut cultivars to Sclerotinia blight in Arkansas.

Peanut Cultivar	Sclerotinia blight <sup>z</sup>	Yield lb/A
Georgia 09B	18.3 a <sup>y</sup>	6,112 c
OLin	25.5 ab	2,957 a
Georgia 06G	29.0 abc	6,289 c
Florida 07	34.8 bc	4,947 abc
FloRun 107	36.0 bc	4,144 abc
727	40.0 c	3,398 ab

<sup>z</sup>Sclerotinia blight is expressed as percent of plot diseased as evaluated on 24 Sept. and 6 Oct.

<sup>y</sup>Means in each column followed by the same letter are not significantly different at  $P = 0.05$  according Tukey's honest significant difference test.

In a greenhouse pot experiment, based on lesion development *Sclerotinia minor* was more aggressive than *S. sclerotiorum* on three peanut cultivars (Georgia 09B, Georgia 06G, and FloRun 107). There was no interaction between cultivars and species of *Sclerotinia*. Average lesion development across cultivars was 6.7 cm and 3.6 cm for *S. minor* and *S. sclerotiorum*, respectively. Though both pathogens are present in Arkansas, *S. minor* will likely be of greater importance as these data suggest it is more aggressive than *S. sclerotiorum*. These studies will provide direction for future disease management strategies in field with Sclerotinia blight.

**Objective 3: Assessment of the occurrence and distribution of newly reported peanut diseases in Arkansas and how production practices impact disease development.** Over 15 fields were inspected in 2015 for new and previously reported peanut diseases. Southern blight was observed at the highest frequency and Sclerotinia blight was confirmed in one field (previously reported) at a low level of severity. This was likely due to warm summer/fall temperatures, which is not favorable for Sclerotinia blight disease development. No leaf spot diseases were reported in 2015 in Arkansas, but they were suspected in Mississippi, so they may be an issue as production continues in the state.

**Objective 4: Develop sustainable strategies for managing peanut diseases through wise deployment of existing resistance, fungicides and best production practices to minimize economic effects of peanut diseases.** Four informative articles were posted on the Arkansas Row Crops Blog website concerning seedling diseases, nodulation, southern blight, and estimating harvest timing. Plans are underway to present current observations to producers at the winter production meeting on 3 March in Jonesboro, AR.