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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, but given that new cultivars are released each year, information is needed on their susceptibility. 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 Extension Station (NES) near Newport, AR. The peanut cultivar 'FloRun 107' was planted on 18 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 irrigated with overhead irrigation and inoculated on 8 July with 0, 60, and 120 ml of dry Rhizoctonia inoculum produced on millet seed per plot. 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. Peanut yield was 5723, 4824, and 4371 lb/A for 0, 60, and 120 ml of inoculum per plot. This is the first trial where a lower ($P = 0.18$) was observed in inoculated vs. non-inoculated plots.

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 NES. The cultivars (Table 1) were planted on 18 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 20 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 at a low disease severity (<0.01%) on all cultivars. Conditions were favorable for disease in late September 35.6% of TUFRunner 511 vines showing symptoms of Sclerotinia blight (Table 1). Georgia 09B was less susceptible to Sclerotinia blight than TUFRunner 511. Overall, the Florida cultivars appear more susceptible to Sclerotinia blight than Georgia 06G and Georgia 09B.

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

Peanut Cultivar	Sclerotinia blight[z]	Yield lb/A
Georgia 06G	16.0 ab[y]	4,268
Georgia 09B	10.0 a	4,821
FloRun 107	28.7 ab	4,120
TUFRunner 511	35.6 b	4,110
TUFRunner 297	23.0 ab	4,300
Georgia 13M	29.3 ab	4,338

[z]Sclerotinia blight is expressed as percent of plot diseased as evaluated on 6 Oct.
[y]Means in each column followed by the same letter are not significantly different at $P = 0.05$ according Tukey's honest significant difference test.

Objective 3: Evaluate new and commercially available fungicides for suppression of southern blight and determine the timing of fungicides needed to manage this disease. Seven fungicides were evaluated to suppress southern blight on two peanut cultivars. 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 7 July with 60 ml of dry *Sclerotium rolfsii* inoculum per plot produced on sterile oat seed. Leaf spot and stem rot were controlled with Muscle ADV at 2.0 pt/A on 9 Aug., and 6 Oct. Fungicides were broadcast on 20 July through flat-fan nozzles (Tee-Jet 110015VS) spaced 30 in. apart using an air pressurized multi-boom plot sprayer. Fungicides were sprayed on 20 July with a multi boom sprayer at 15 GPA. Southern blight severity was low at the time fungicides were applied and through the season even though weather conditions were warm and favorable for disease development. All fungicides were similar in efficacy and yield protection with Georgia 06G expressing some tolerance to Southern blight with a greater degree of severity but greater yield than Georgia 09B

Table 2. Efficacy of seven fungicide to control southern blight on two peanut cultivars.

Cultivar	Southern Blight 24 DAA	Yield (lb/A)
Georgia 09B	2.2 b[a]	5,071 b
Georgia 06G	4.2 a	5,615 a
Treatment and rate (oz/A)		
Evito T, 9	2.3	6,039
Elatus, 9	2.5	5,047
Muscle ADV, 32	2.6	5,013
Provost, 8	2.9	5,224
Fontelis, 16	3.4	5,322
Convoy, 16	3.7	5,364
Alto, 5.5	4.5	5,463
NTC	3.5	5,271
Statistics: Prob (F)		
Cultivar	0.06	0.02
Treatment	0.36	0.38
Cultivar x Treatment	0.24	0.26

[a] Data within each column section followed by the same letter are not significantly different at α 0.10 according to Tukey's HSD.

Objective 4: Assessment of the occurrence and distribution of recently reported peanut diseases and how production practices (irrigation, row spacing, lime and boron) impact disease development. Peanut yield statewide average was 4,800 lb/A on 22,500 acres planted in the state. This yield average exceeded that of all other primary peanut producing states in the US. Disease pressure was relatively low in 2016 on peanut with pod rot being among the most common disease detected in the state. Some late leaf spot was observed in those counties with the most peanut production, which was Craighead and Mississippi Counties.

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 articles were posted on the Arkansas row crop blog to alert producers to peanut producers to southern blight disease imposters and issue with propiconazole use in peanut. One training was provided at a UA sponsored scout school in Jonesboro. One peanut production meeting was offered in March in Jonesboro with 45 in attendance. An infield training was also extended to agents and producers in late summer.