

NATIONAL PEANUT BOARD/SOUTHEAST PEANUT
RESEARCH INITIATIVE
FINAL PROGRESS REPORT FOR WORK
DONE UNDER RESEARCH AGREEMENT

Quarter ending

March 31, 2007

INSTITUTION: University of Georgia

PROJECT TITLE: Residual herbicide affect on seedling peanut development

RES. AGR. NO.: 25-21-RD328-761 PROJECT LEADER: Dr. Timothy Grey
GACCP Control NO.: 4-857-653-0

EXPIRATION DATE: June 30, 2007 NPB CONTACT: Cal Chancy
NPB Control NO.: 193

REPORT OF PROGRESS: The initial intent of this research was to measure the effects of herbicides on peanut seed germination. However, there were numerous problems with stand establishment in the conetainers filled with soil. We initially tried to plant the peanut then over spray with each herbicide treatment, then put this in the growth chamber. Each conetainer was then irrigated to activate the herbicide and maintain soil moisture. After 2 weeks, the germination was variable in the growth chamber set at 25/35 C alternating temperatures with 16/8 hour light/dark ratio. Then we tried treating the soil and then planting the peanut into the treated soil and still had variable germination results. Overall we have a lot of data that is in the process of being entered. However, we are not confident of its reliability and will need to analyze it further before publication will be considered.

However, we were able to use the seed from the previous experiment to examine germination variability of these cultivars using the thermo-gradient table. Ten seed of each cultivar were placed on Petri dishes lined with moistened germination paper. Each dish was placed on the table in a specific location where the temperature was held constantly and repeatedly measured every 30 minutes with a data logger. Peanut germination was counted daily for 7 consecutive days at temperatures ranging from 15 C (60 F) to 35 C (95 F).

Experiments were conducted to evaluate the germination response of 11 peanut cultivars using a temperature gradient. The effect of temperature on germination response was conducted on a 243 (length) x 91 (width) x 7.6 (depth) cm temperature gradient table. The table is a solid aluminum block with hot water running through one end and cold through the other. This results in a continuous temperature gradient ranging from 14 to 38 °C along the length of the table. Temperatures were randomly measured and recorded at 30 minute intervals with a data logger by placement of thermocouples into holes uniformly drilled on the underside of the table to within 0.5 cm of the table surface. Seed were randomly distributed on moistened germination paper, which was placed in a Petri dish. For each cultivar, 22 Petri dishes were placed at 1.0 °C increments along the length of the table. Beginning at 24 hours after seeding, peanut germination was counted when the radicle extended for more than 1 mm, and removed from the dish. Germination was

counted daily, through 7 days after seeding. Peanut germination averaged across the 11 cultivars, was 76% and less for temperatures below 18.4 °C, 86% and greater between 19.4 and 34.2 °C, but dropped off to 83% at 36.1 °C. Overall, CRSP98 exhibited the weakest germination responses (0 to 95%) with 3081R having the highest germination across all temperature regimes (50 to 100%). These data indicate that the 18 C (65F) rule of planting remains in effect for the cultivars currently used in GA peanut production. There was great variability in the seed lots examined.

From this research a presentation was given at the 2007 APRES meeting in Birmingham AL entitled **Temperature affect on peanut (*Arachis hypogaea*) seed germination** by T.L. GREY, J.P. BEASLEY, JR., and A.M. WISE. *In* Proceedings American Peanut Research & Education Society Abstracts 39: In press.

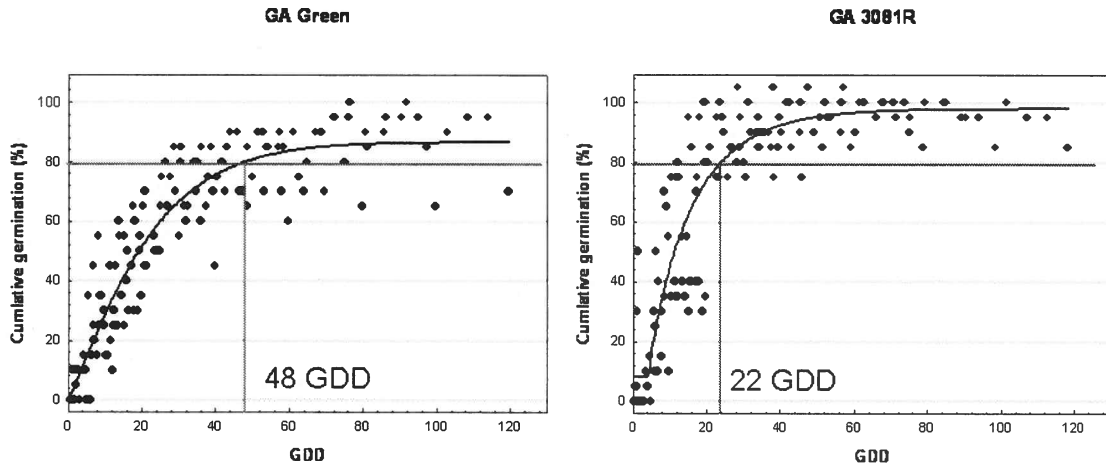
We are continuing this research in 2007. It has allowed us to model the effect of temperature on peanut germination. An example is given below.

Growing degree day (GDD) to 80% germination of GA peanut cultivars for Weibull function.

Cultivar	GDD to 80%
GA Green	48
GA O3L	22
GA O1R	Did not reach 80%
GA O2C	37
AP-3	28
3085A	22
CRSP38	Did not reach 80%
3081R	22
Tifrunner	32
Carver	40
C-99R	Did not reach 80% (poor seedlot)



Growing degree day Weibull function - Sigmoidal



AT 3081R

