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NATIONAL PEANUT BOARD / SOUTHEAST PEANUT RESEARCH INITIATIVE

FINAL REPORT for WORK DONE UNDER RESEARCH AGREEMENT # 26-31-RE671-548 GACCP PNUT MATRTY DET BEASL

INSTITUTION:	University of Georgia
PROJECT TITLE:	Development of Improved Methods for Peanut Maturity Determination
RES. AGR. NO.:	26-31-RE671-548
PROJECT LEADER:	Dr. John P. Beasley, Jr.
EXPIRATION DATE:	30 June 2013
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FINAL REPORT: The following two trials were planted in Georgia in crop year 2012 evaluating improved methods for peanut maturity determination.

Executive / Interpretive Summary:

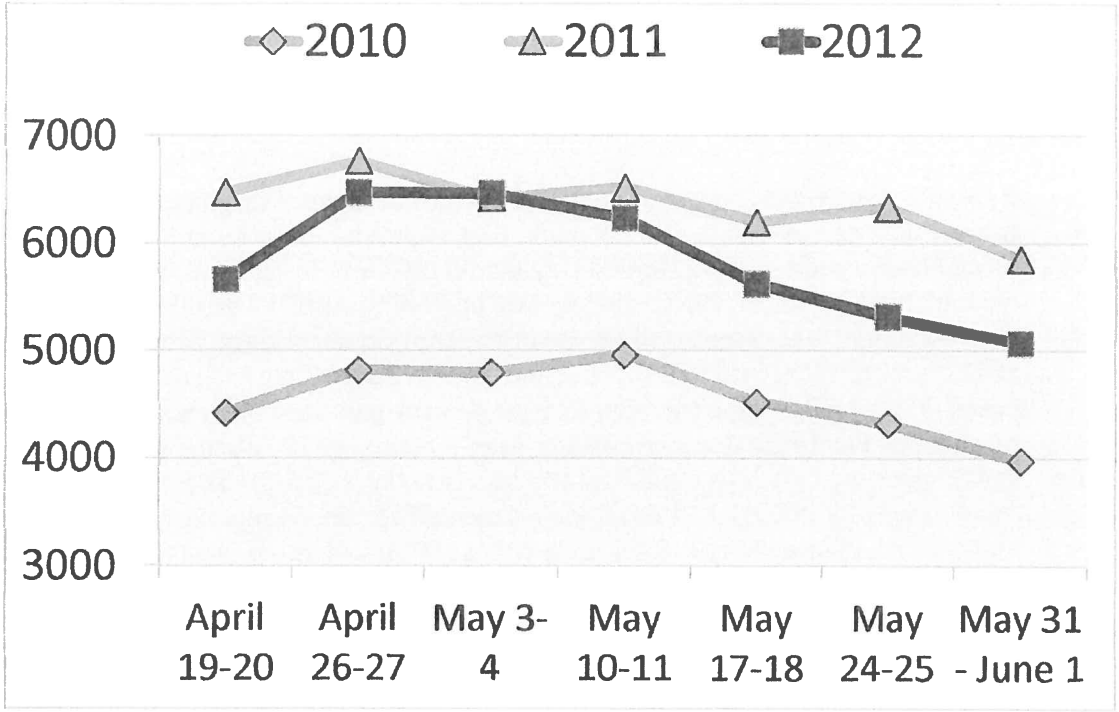
Research trials were conducted in 2012 to determine peanut response to planting and harvest date and to evaluate a new method of improving harvest timing determination using an adjusted Growing Degree Day model (aGDD). In one trial, four peanut cultivars were planted for seven consecutive weeks, beginning April 19 and finishing on May 31. Harvest timing was determined by use of the Hull-Scrape Maturity Profile Board. The aGDD's were calculated to determine the amount accumulated to reach optimal harvest based on the Hull-Scrape Maturity Profile. Results indicated that maximum yield was reached for Planting dates April 19, 26, May 3, and May 10. Yield for the May 17, 24, and 31 planting dates were significantly less than the first four. These results were the same as we saw in 2010 and 2011, yield potential for the current peanut cultivars is higher when planted in late April or early May. In the Planting Date by Harvest Date trial we had two planting dates and four harvest timings, based on 2,300, 2,400, 2,500 and 2,600 aGDD accumulation. For the April 24 planting date, yield potential was maximized at 2,600 aGDD's. For the late planting (May 20) the cool October weather resulted in yield being maximized at 2,400 aGDD and the heat unit accumulation (represented by aGDD values) never increased, which meant yield potential reached its peak and never increased. This supports the need to plant earlier to maximize yield potential.

Planting Date Trial

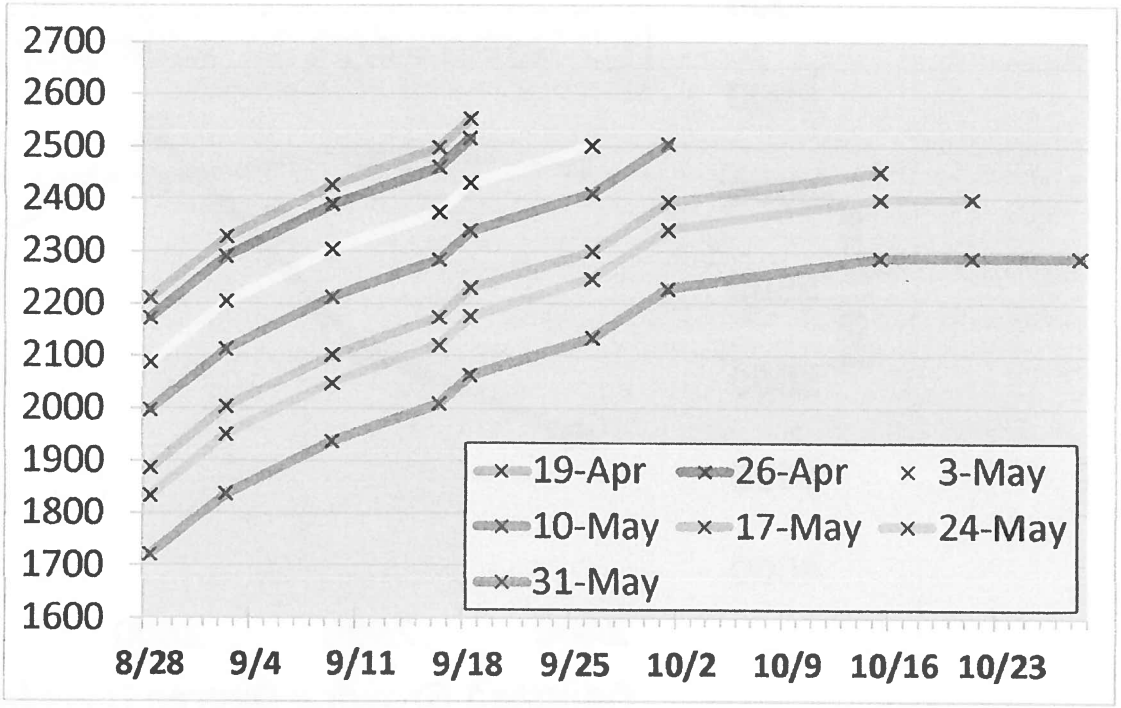
A trial was established to evaluate an adjusted Growing Degree Day (aGDD) model for peanut to improve the accuracy of maturity determination. The model

was developed by Dr. Diane Rowland (currently peanut physiologist at the University of Florida) and Dr. Wilson Faircloth (currently with Syngenta) when they were research scientists with the USDA-ARS National Peanut Research Lab. Four runner-type cultivars (Georgia-06G, Georgia-07W, Georgia-10T, Georgia Greener) were planted at one-week intervals beginning April 19 for seven consecutive weeks (April 19, April 26, May 3, May 10, May 17, May 24, May 31). The trial was blocked by planting date and cultivars as the sub-plot within each planting date (split-plot design). Individual plots were two rows by 40 feet ni length and there were four replications. Each cultivar was planted in the twin row pattern and seeding rate was 3 seed per row-foot per twin row. Maturity will be determined by the Hull-Scrape Maturity Profile Method and the aGDD for each cultivar at optimal maturity will be calculated to determine the aGDD that correlates most closely with the Hull-Scrape Profile. Yield and grade data was also be recorded. Objective of the trial was to determine if optimal maturity of peanut cultivars can be determined using a growing degree day model.

The graph below shows the yield response in 2012 compared to the trials in 2010 and 2011 evaluating the response of cultivars to planting dates.



The black line shows the data from 2012 and the data indicate that as planting is delayed in to late May or early June there is a significant reduction in yield potential. The adjusted Growing Degree Day (aGDD) units were monitored for each planting date with a target of 2,500 aGDD's to reach optimal maturity. The chart below shows the aGDD accumulation for the growing season for each planting date.

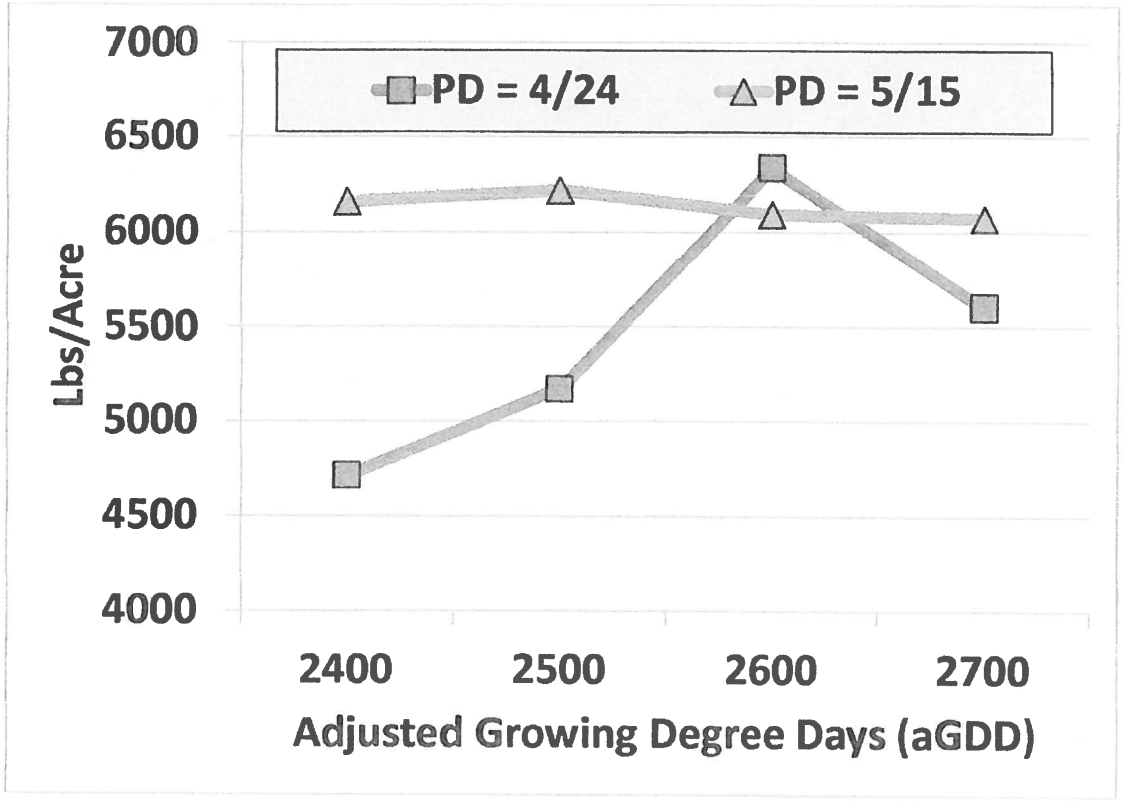


The aGDD accumulation for the May 17, 24, and 31 planting dates never reached the 2,500 target in 2012, which is an indication that maximum yield potential was never reached.

Planting Date X Harvest Date Trial

A trial was established to evaluate the response of Georgia-06G, Georgia-09B, Georgia-10T, and FloRun '107' cultivars to various harvest dates based on the adjusted Growing Degree Day model discussed in the trial above. There were two planting dates for each cultivar, April 24 and May 15. The four harvest dates were based on the following aGDD accumulations – 2,200, 2,400, 2,500, and 2,600. Based on earlier research the optimal harvest time, based on maximized yield and grade, is approximately 2,500 aGDD. The trial was blocked by planting date and the four harvest dates by four cultivars were established as a 2 X 2 factorial within each planting date. Individual plots were two rows (single row pattern) by 40 feet in length and there were 4 replications. Date to be collected include aGDD, Hull-Scrape Profile, yield, and grade factors.

The graph below shows yield response for the two planting dates and the four harvest dates.



The April 24th planting date had a maximum yield at 2,600 aGDD's, slightly more than the expected target of 2,500. Yields for the May 15th planting date reached maximum at 2,400 and leveled off, probably due to the cooler temperatures in October that resulted in very little, if any heat unit accumulation.