A Report to the Georgia Agricultural Commodity Commission for Peanuts
on
Graduate Student Research and Education Support in Peanut Agronomics

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Funding was requested to support graduate student education in peanut agronomics. Graduate students are an integral part of a research program. It produces and prepares future scientists. The funding for this project was used to support a Master of Science (M.S.) degree program for Jason Arnold, under the direction of Dr. John Beasley. Jason began his M.S. degree program in January 2012. His research project focuses on calcium nutrition and its relationship to germination (seed calcium content) and response to temperature. Jason's first year of research was during the 2012 crop year. Jason is on track to complete his M.S. degree in spring of 2014. He has completed his field research (two years) and is currently completing his final lab experiments. The following is a synopsis of his research to this point.

I. Introduction

Some of the recently released peanut cultivars produce larger seed than cultivars that have been widely used in the past. Some of these cultivars, especially Georgia-06G, have become very popular with producers because of their high yielding characteristics. Georgia-06G is considered a large-seeded cultivar, where past cultivars that were popular, such as Georgia Green, generally produced small or medium seed. One important issue that arises with a shift in cultivars and seed size is the calcium fertility requirements for production. Calcium is the most common liming nutrient in peanut production, and lack of proper calcium levels in the soil can result in reduced yield and poor quality seed. The calcium fertility recommendations currently in use are based on cultivars that are no longer widely used and those cultivars produced smaller seed than some of the current cultivars. The objective of this research is to help determine if the current calcium recommendations for peanut production are adequate for large-seeded peanut cultivars.

II. Field Research

To determine if the recommendations are adequate for large-seeded peanut cultivars, research was conducted at the Coastal Plain Experiment Station in Tifton and at the Southwest Georgia Research and Education Center in Plains. These locations were selected because of their difference in soil type, thus accounting for the range of soils that peanuts are grown in Georgia. One large-seeded cultivar (Georgia-06G) and one medium-seeded cultivar (Georgia Greener) were planted at both locations during the 2012 and 2013 growing seasons. Four application rate of gypsum (0, 500, 1000, and 1500 lbs. /acre) were applied to determine if yield would increase with amount of gypsum applied. Gypsum was applied at early bloom, about 30 days after planting. Irrigation was used at both locations. After harvest, the yield data from both locations was analyzed. The analysis showed there was no statistical difference in yield between cultivars, or between gypsum application rates at both locations. The lack of difference between gypsum application rate has been attributed to the high soil calcium content. Both locations had soil calcium levels near 500 lbs. per acre, prior to gypsum application. Currently, UGA recommends

that soil calcium levels be at least 500 lbs. /acre, and gypsum should be applied if calcium levels are less than 500 lbs. /acre. A graph (fig. 1) below shows the yield data combined over 2012 and 2013. The results of this project agree with prior research, and show that standing UGA recommendations for calcium requirements in peanut production are adequate for current cultivars. Samples from the trials at both locations are being shelled and seed will be germination tested, normal and cold test. Seed will also be germination tested on a thermal gradient table to determine response at varying temperature ranges. The data from the 2012 (fig 2.) germination projects does not show any differences between cultivars or gypsum rates, but does show noticeable differences in germination different soil temperatures. The second year of the germination is project currently in process.

Fig. 1

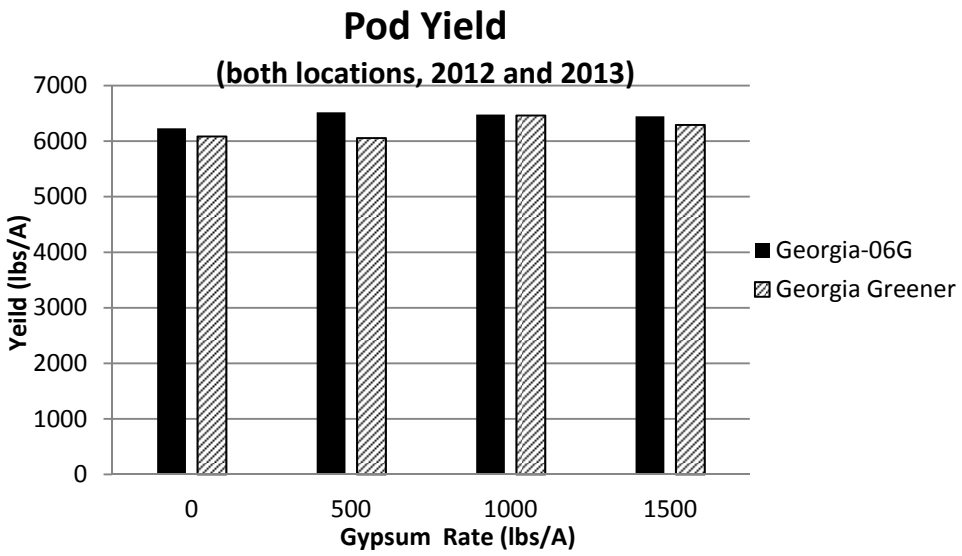


Fig. 2

