

Peanut Cultivar Response to Planting Date

John P. Beasley, Jr., R. Scott Tubbs, and John E. Paulk, III
University of Georgia
Crop and Soil Sciences Department

Introduction

For many years the traditional recommended planting date in Georgia was April 15 through May 20. How early planting started was dependent upon soil temperature at the four-inch depth. It was recommended to wait and plant after the four-inch soil temperature was 65 degrees Fahrenheit or higher for three consecutive days or longer. It was also recommended to not plant just ahead of an approaching cold front that would drop the temperature rapidly. In most years the soil temperature was warm enough by April 15 to plant at most any location in the Georgia peanut production region. However, in some years the air temperature would remain cold enough or drop suddenly in mid to late April to prevent the soil to warm up enough to plant without risk of slowed germination and emergence. Slow germination and emergence can lead to seedling disease or rotting.

Spotted wilt disease, caused by tomato spotted wilt virus (TSWV), is a major yield limiting factor of peanut. Previous research has clearly shown that risk of spotted wilt disease is increased by planting in April. A very high percentage of producers in Georgia have adopted the planting date component of the Peanut Rx (the index for lowering risk to TSWV and other peanut diseases) by planting later in order to help reduce their risk of TSWV. Prior to TSWV becoming such a problem, 30-45% of the peanut acreage in Georgia was typically planted in April. Since the risk index for managing TSWV was released in 1997, the percent of peanut acreage planted in April has dropped to less than 5%. A very high percentage of the acreage is now planted in the three week period of May 11-31. This has resulted in logistical problems at harvest in regards to timing of harvest and equipment availability.

Producers and personnel at buying points and shelling plants would like to see more acreage planted in April if possible to reduce some of the logistical problems associated with later planting. Planting in mid to late May also puts some cultivars at risk of not reaching optimal maturity if cold temperatures in October slow, or stop, pod maturation. Some of the more recently released peanut cultivars have higher levels of resistance to TSWV than Georgia Green. A trial was conducted to determine the response of these cultivars to planting in April compared to a mid to late May planting.

Experimental Methodology

Four sites in Georgia were selected in 2007 for establishing planting date trials. University of Georgia locations utilized for these trials were: Attapulgus Research and Education Center in Decatur County, the Coastal Plain Experiment Station in Tifton, and the Southeast Georgia Research and Education Center near Midville in Burke County. A fourth site utilized for the planting date trial was the Sunbelt Expo Farm in Colquitt County. The following cultivars were planted at all four locations: Georgia Green,

Georgia-03L, Georgia-06G, AP-3, AT 3081R, and AT 3085RO. Florida-07 was planted at Tifton and Sunbelt Expo. AP-4 was planted at Attapulcus and Tifton. Carver and McCloud were planted at Sunbelt Expo and Andru II was planted at Midville.

Plot width, six feet, was the same at each of the four locations. Length of each experimental unit or plot varied from location to location. At Attapulcus the plots were 50 feet in length, at Tifton they were 40 feet in length, and at the Sunbelt Expo Farm they were 330 feet in length. There were four replications at each location. The experimental design was a split plot with planting date as the main plot and cultivars as the sub-plot. Planting dates are listed in Table 1.

Table 1. Planting dates for peanut cultivars at four locations in Georgia in 2007.

Locations	Planting Date 1	Planting Date 2	Planting Date 3
Attapulcus	April 10	May 9	June 11
Tifton	April 19	May 11	May 31
Midville	April 17	May 17	
Sunbelt Expo	April 18	May 16	

All locations were planted with a Monosem precision air planter. The twin row pattern was used at all locations and seeding rate was set at three seed per row-foot in each twin row. Planting depth was 2.25 inches and Thimet brand insecticide was applied in-furrow at the rate of 6 pounds per acre. Within 24 hours of planting, Sonolan (1 qt/acre), Strongarm (0.44 oz/acre), Valor (3 oz/acre) herbicides were applied and watered in with 0.5 to 0.75 inches of irrigation as the base weed management program. All locations were irrigated on an as needed basis. All other production practices, including disease and insect management, were based on University of Georgia recommendations.

Results and Discussion

Data collected were yield (pounds per acre), percent total sound mature kernels, tomato spotted wilt virus (TSWV) severity (%), and plant stand at 30 days after planting and when inverted. All data were subjected to analysis of variance (ANOVA).

TSWV was relatively light in 2007. The level of TSWV at Midville was low enough that ratings were not taken on the second planting date when the level was very low on the first planting date. The Tifton location had the highest level of TSWV, especially on the April 19th planting date.

Tifton location – RDC Pivot

Analysis of yield data indicated no interaction but a significant difference among cultivars and a significant difference between the three planting dates (Table 2). There was a significant interaction between planting dates and cultivars for percent total sound mature kernels (%TSMK). Statistical analysis also indicated a significant interaction for percent tomato spotted wilt virus severity (%TSWV).

Table 2. Response of peanut to timing of planting, Coastal Plain Experiment Station, Tifton, GA.

Planting Date	Yield (lbs/A)	% TSMK	% TSWV
April 19	4652	71	14
May 11	5803	74	4
May 31	4350	76	NA
LSD (0.05)	196	1	1

Attapulgus location – Attapulgus Research and Education Center

Analysis of yield data at Attapulgus indicated significant interactions between planting date and cultivars for yield and percent TSWV. There was no interaction for percent TSMK but there was a significant difference among cultivars and between planting dates. The yield data are presented in Table 3.

Table 3. Yield response of peanut cultivars to planting date, Attapulgus Research and Education Center, Attapulgus, GA.

Cultivars	Planting Dates		
	April 10	May 9	June 11
Georgia Green	3561	4549	3775
AP-3	3238	4716	3395
Georgia-03L	3657	4556	4148
Georgia-06G	3868	5424	5039
AT 3081R	3939	4574	4138
AT 3085RO	4101	4831	4234
AP-4	4020	5215	4383
LSD (0.05) = 449			

Georgia-06G had the highest overall yield at the May 9th planting date and June 11th planting date. AT 3085RO had the highest yield at the April 10th planting date.

Sunbelt Expo location – Colquitt County

Data analysis of this location indicated a significant interaction between cultivars and planting dates for yield and percent TSMK. There was a significant difference among cultivars and between the two planting dates for percent TSWV, but no interaction between planting dates and cultivars. The yield data are presented in Table 4.

Table 4. Yield response of peanut cultivars to planting date, Sunbelt Expo Farm, Colquitt County, GA.

Cultivars	Planting Dates	
	April 18	May 16
Georgia Green	3540	3145
AP-3	3982	3779
Georgia-03L	4163	3709
Georgia-06G	4703	4778
AT 3081R	4143	4170
AT 3085RO	4538	4191
Carver	5085	3818
McCloud	3732	3982
Florida-07	NA	4259
LSD (0.05) = 681		

At the Sunbelt Expo location, the average yield over all nine cultivars for the April 18th planting date was 4236 lbs/acre compared to 3981 on May 16th. This was the only location of the four in which yields were higher for the early planting date. Wet weather late in the year on the poorly drained soils can explain part of the yield reduction for the May 16th planting date.

Midville location – Southeast Georgia Research and Education Center

Analysis of the yield data from this location indicated no interaction between planting dates and cultivars. There was, however, a significant difference between planting dates when averaged over cultivars and there was a significant difference among cultivars when averaged over the planting dates. Analysis of percent TSMK indicated an interaction between cultivars and planting dates. Due to very low levels of tomato spotted wilt virus, ratings were taken only at the first planting date. Data from this location is provided in Table 5 below.

Table 5. Response of peanut to timing of planting, Southeast Georgia Research and Education Center, Midville, GA.

Planting Date	Yield (lbs/A)	% TSMK
April 17	3782	72
May 17	5017	75
LSD (0.05)	334	1

Overall, the data from all locations indicated that planting in the April 10-20 time frame produced lower yields and total sound mature kernels than planting in the May 10-20 time frame. This is consistent with previous planting date research. Because 2007 was a relatively light year for spotted wilt virus, the one location with any appreciable level of TSWV (Tifton) indicated higher levels of TSWV in the April planted peanuts compared to May planting.