Peanut Yield and Grade Responses to Timing of Bahiagrass Termination and Tillage in a Sod-based Crop Rotation

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ABSTRACT

Rotation of row crops with perennial grasses has been shown to improve soil quality characteristics, decrease pest incidence, and increase crop yield. Experiments were conducted in Florida during 2006 and 2007 at Marianna and Quincy to determine effects of termination date and subsequent tillage of established bahiagrass (*Paspalum notatum* L.) on peanut (*Arachis hypogea* L.) yield and market grade characteristics when rotating from bahiagrass to a row crop. Treatments included two bahiagrass termination dates (fall vs. spring) and six tillage methods [strip-till (in-row subsoiling), disk plus moldboard plow, disk plus chisel, disk plus paratill plus strip-till, disk, and strip-till with 45 kg N/ha]. Bahiagrass termination timing did not affect soil mechanical resistance, peanut yield or market grade characteristics, including percentages of sound mature kernels, split kernels, other kernels, and hulls. Although significant differences in soil mechanical resistance were detected among tillage treatments, peanut yield did not differ among the tillage methods except for the disk alone in 2007 at Quincy. Strip-till peanut yield did not respond to N application. When pooled over termination timing, peanut yields in strip-till, disk plus moldboard plow, disk plus chisel, disk plus paratill plus strip-till, disk, and strip-till plus 45 N were 4830, 5000, 4810, 4810, 4770, and 4620 kg/ha, respectively. These results indicate that when using perennial grasses in sod-based rotations, farmers have a wide window from fall to spring to terminate bahiagrass for optimum peanut production regardless of tillage system.

Key Words: Soil resistance, tillage system.

Continuous, monoculture farming practices result in many pest management issues, such as a buildup of various above- and below-ground diseases, nematodes, and insect predation pressures (Dickson and Hewlett, 1989; Tanaka *et al.*, 2002; Zentner *et al.*, 2001). Crop production guides and research articles list crop diversification, rotation, and cropping sequence as important components of crop production (Edwards *et al.*, 1988). Compared to conventional monocultures, short-duration crop rotation or crop diversification improves nutrient and water conservation and soil quality, thereby enhancing agricultural sustainability (Zentner *et al.*, 2002). Crop rotations are also generally recognized as being economically and agronomically beneficial and offer more flexible marketing opportunities (Bayer *et al.*, 2000; Reeves, 1994).

In the southeast United States, peanut and cotton (*Gossypium hirsutum* L.) are two major agronomic crops requiring a long growing season. However, cotton/peanut farmers face great challenges in maintaining production sustainability and profitability using the traditional crop rotation system of peanut followed by two years of cotton (peanut-cotton-cotton). The major challenges to production include pests, infertile soils, low soil organic matter, and low soil water holding capacity (Katsvairo *et al.*, 2006). Integration of perennial grasses, such as bahiagrass, into the current rotation system of peanut and cotton has been proposed by several states in the southeast United States (Katsvairo *et al.*, 2007). Studies across the United States have demonstrated numerous advantages of using deep rooted perennial grasses in cropping systems (Allen *et al.*, 2005; Allen *et al.*, 2007; Franzluebbers, 2007; Katsvairo *et al.*, 2006; Russelle *et al.*, 2007; Sulc and Tracy, 2007). For example, including bahiagrass in the rotation adds significantly to the soil organic and N pools as well as helps diminish nematodes and other pests normally found with annual row crops (Boman *et al.*, 1996). Katsvairo *et al.* (2006) reported that two of the most important advantages of a rotation involving perennial grasses (i.e., sod-based rotation) are increases in soil organic matter and improved soil quality.

Studies have shown that sod-based rotation of peanut and cotton with bahiagrass, such as two years of bahiagrass followed by a year each of peanut and cotton (bahiagrass-bahiagrass-peanut-cotton) in the southeast United States can significantly reduce disease (Dickson and Hewlett, 1989; Johnson *et al.*, 1999; Marois and Wright, 2003), improve crop growth, and increase crop yield and profitability (Brenneman *et al.*, 1995; Katsvairo *et al.*, 2006; Norden *et al.*, 1977) as compared with

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conventional cropping systems. The value of bahiagrass in the rotation is clear in many field experiments (Brenneman *et al.*, 1995; Johnson *et al.*, 1999; Wright *et al.*, 2004). Despite much positive research, however, many growers view sod-based rotations as cost prohibitive due to investment in sowing pasture and lack of a cash crop in two of four years.

In the sod-based rotation of bahiagrass-bahiagrass-peanut-cotton in the southeast United States, bahiagrass is used as hay or pasture grazed by cattle. The second-year bahiagrass has to be terminated at the end of growing season (late fall) or early spring of the next year for the succeeding peanut crop. The timing of bahiagrass termination is also a major concern in sod-based rotations due to the amount of root mass associated with perennial grasses and its state of decomposition. Delaying bahiagrass termination date from late fall to early spring can extend the grazing period or hay production, but may negatively affect peanut yield because decomposition of bahiagrass residues and roots may bind certain nutrients, especially N, important for crop growth. Therefore, determination of responses of peanut yield and market grade characteristics to bahiagrass termination date may further improve system efficiency of the sod-based rotation.

With rising fuel prices and other input costs, it has become more important to find ways of reducing inputs and maintaining or increasing profits while increasing peanut yield. Studies suggest that there are considerable differences among different tillage methods in input costs, soil impact or crop yields (Johnson *et al.*, 2001; Sidhu and Duiker, 2006). Tillage methods influence not only soil properties (Raper and Reeves, 2007; Siri-Prieto *et al.*, 2007a), but also crop yields (Raper *et al.*, 2007; Reeves and Mullins, 1995; Siri-Prieto *et al.*, 2007b). Soil mechanical resistance and compaction are associated with tillage methods. Studies have confirmed that soil compaction affects crop root growth, limits use of soil water and nutrients, and may result in reduced crop growth and low yields (Alakukku and Elonen, 1995; Atwell, 1990). Site-specific subsoiling improves crop production in the United States Coastal Plain soils (Raper *et al.*, 2007). Siri-Prieto *et al.* (2007a) compared cotton yield response to several tillage treatments under Alabama rainfed conditions with integration of winter-annual grazing and found that noninversion deep tillage following oat (*Avena sativa* L.) in a conservation tillage system, provided producers extra income while protecting the soil resource. However, it is unclear how peanut growth and yield will respond to tillage method in a sod-based rotation in the southeast United States.

Our hypothesis was that bahiagrass termination timing and tillage method might affect peanut yield and market grade characteristics due to bahiagrass residue decomposition and soil mechanical resistance. Therefore, experiments were conducted at two locations in Florida to evaluate interactions of tillage and bahiagrass termination timing on soil mechanical resistance, peanut yield, and market grade characteristics.

Materials and Methods

The experiments were conducted during 2006 and 2007 at the University of Florida's North Florida Research and Education Center at Marianna (30° 52.43′ N, 85° 10.95′ W) and Quincy (30° 32.79′ N, 84° 35.50′ W). Soil at both locations was a Dothan sandy loam (fine, loamy siliceous, thermic Plinthic Kandiudults). Bahiagrass establishment and routine management were similar to those by Katsvairo *et al.* (2007). Bahiagrass, cv. Tifton 9 (Burton, 1989), was established in the spring of 2004 and 2005 at a seeding rate of 22 kg/ha, using a Great Plains No-Till Drill (Great Plains Mfg., Assaria, KS). A combination fertilizer, containing 560 kg/ha 5.0-4.4-12.5 (N-P_2O_5-K_2O), was broadcast immediately before seeding bahiagrass. No insecticides or herbicides were applied to the bahiagrass during the 2-yr growth period. First-yr bahiagrass was mowed twice to reduce weed competition, while second-yr bahiagrass was cut twice for hay in early July and late August.

Treatments included two levels (main plots) of bahiagrass termination dates (fall vs. spring) and six tillage methods (sub-plots) within each termination date. In Marianna, the fall and spring termination dates of bahiagrass in both years were 25 October and 20 March. In Quincy, the fall and spring termination dates of bahiagrass were 26 October 2005 and 29 March 2006, respectively, for the 2006 study and 25 October 2006 and 4 April 2007, respectively, for the 2007 study. Bahiagrass was terminated with glyphosate at 0.84 kg a.e./ha.

The six tillage methods included (1) strip-till, (2) disk plus moldboard plow, (3) disk plus chisel, (4) disk plus paratill plus strip-till, (5) disk, and (6) strip-till plus 45 N. A rate of 45 kg N/ha fertilizer of ammonium nitrate was broadcast by hand to the strip-till plus 45 N treated plots prior to peanut planting to determine if N was limiting peanut yield due to decomposition of bahiagrass residue and roots in strip-till, a commonly used tillage method with annual cover crops for cotton, corn (*Zea mays* L.), soybean [*Glycine max* (L.) Merr.], and other row crops. In the treatments with disk operation, double disk plowing to a depth of 20 cm occurred using a Brown lift type disk harrow (Brown Manufacturing Co., Ozark, AL). A John Deere model 975 switch plow was used for the moldboard plowing with a 25 cm depth. The paratill was implemented using a Worksaver TerraMax™ (Litchfield, IL) with a 30 cm depth. A 7-shank standard chisel was used with a 25 cm depth for the chisel tillage. In the tillage treatments with strip-till, a Brown Ro-till implement (Brown Manufacturing Co., Ozark, AL) was used to till a band approximately 18 cm wide with 30 cm deep in rows where peanut would be planted. Tillage operations were implemented 1 d before sowing peanut. Except for bahiagrass termination date and tillage treatments, other field management practices, such as irrigation and pesticide applications, were scheduled for all plots based on peanut crop production recommendations in the region. Peanut, cv. AP-3 (Gorbet, 2007), was seeded with a two-row, single row pattern vacuum planter (ATI Inc., Lenexa, KS) on 15 May 2006 and 3 May 2007 in Marianna and 16 May 2006 and 4 May 2007 in Quincy with a row spacing of 91 cm. Peanut seed was placed 2.5 cm deep with a final in-row population of 19.7 seeds per meter row. The sub-plot (i.e. tillage treatment) size was 9.1 m long and 5.5 m wide with six rows per plot.

The number of seedlings emerged 19 d after planting (DAP) for a 9.1-m section of the two middle rows was recorded at Quincy in 2007. Leaf greenness was measured from 20 randomly selected most fully expanded upper leaves in each plot using a SPAD-502 Chlorophyll Meter (Minolta Co., LTD. Japan) on 28 June (flowering) and 17 July (pod development) during 2007. Ground coverage of plant canopy was recorded on 17 July 2007 using a scale of 0 to 100%. When peanut reached optimum pod maturity (Williams and Drexler, 1981), the two middle yield rows as well as four border rows in each plot were mechanically dug and inverted using a KMC (Kelly Manufacturing Co., Tifton, GA) digger/inverter and harvested 3 days later with a 5000 Express peanut picker (Gregory Manufacturing Co., Lewiston Woodville, NC). After recording fresh weight, pod samples from the yield rows were placed in a forced-air dryer at 45°C for 72 hr. Peanut yields were determined based on sample dry weight. Then, a 500-g dry sample of pods from each plot was obtained to determine market grade characteristics including percentages of sound mature kernels (%SMK), sound splits (%SS), other kernels (%OK), and hulls using the USDA standard methods (USDA, 2005).

Soil mechanical resistance was measured in all plots on 28 May, 15 June, 25 July, and 15 August in the 2006 growing season and 18 May, 5 June, 18 July, and 1 August in the 2007 growing season at Quincy. These dates of measurements were associated with peanut seedling emergence and growth, initial flowering, the peak of pegging, and pod filling. Soil mechanical resistance was determined in three randomly selected locations from 0 to 56 cm soil depths with a 2-cm increment using a CP-20 Cone Penetrometer (Rimik Agricultural Electronics, Brisbane, Australia). Three measurements were made randomly each time between the two middle rows in each plot.

Precipitation during the 2006 growing at Marianna (443 mm) and Quincy (641 mm) were 318 and 120 mm less, respectively, than the long-term average (761 mm) and amounts of irrigation at the two locations were 273 and 118 mm, respectively (Table 1). Year 2007 was extremely dry at the experimental locations as well as in the southeast United States. Cumulative precipitation in Marianna (333 mm) and Quincy (390 mm) from April to September were only 44 and 51% of the long-term average, respectively (Table 1). The seasonally cumulative amounts of irrigation in Marianna and Quincy in 2007 were 241 and 129 mm, respectively. Water deficit irrigation was used in 2007 at both locations due to limited water availability in an extremely droughty year in the southeast United States. The precipitation and irrigation data may help explain in part the peanut yield variation between the two locations or years.

The experimental design was a randomized complete block with a split plot arrangement of treatments. Bahiagrass termination dates served as main plot units and tillage methods served as sub-plot units with four replications. Because of great variability in soil resistance among individual measurements and different sampling dates, data of soil mechanical resistance were first averaged across the three locations and four measurement dates for each plot within a year before statistical analyses. Data of soil mechanical resistance at different depths, peanut yield, %SMK, %SS, %OK, and %hulls were subjected to the PROC MIXED procedure of SAS (SAS, 2002). Replication and year were considered random effects, while bahiagrass termination date and tillage treatments were considered fixed effects. Means of significant main effects and interactions were separated using Fisher's protected LSD tests at $P \leq 0.05$.

Results and Discussion

Year × tillage interactive effect on soil resistance was significant at most soil depths of 2 to 30 cm. Bahiagrass termination date (fall vs. spring) did not affect soil mechanical resistance at any of

Table 1. Monthly precipitation (Prec.) and amount of irrigation (Irr.) at Marianna and Quincy, Florida in the 2006 and 2007 growing seasons and long-term (25-yr average of 1981–2005) historic monthly precipitation and potential evaportranspiration (pET) in the region.

	Marianna				Quincy					
	2006		2007		2006		2007		Long-term	
Month	Prec.	Irr.	Prec.	Irr.	Prec.	Irr.	Prec.	Irr.	Prec.	pET
	mm									
April	43	0	26	25	32	25	26	17	92	122
May	131	51	57	51	121	38	25	37	122	150
June	54	57	58	38	83	25	74	26	143	145
July	58	64	70	44	98	30	73	13	171	142
August	133	76	88	51	216	0	75	36	138	134
September	24	25	34	32	91	0	94	0	95	114
Total	443	273	333	241	641	118	367	129	761	807

the soil depths (Figure 1A), but year and tillage method (Figure 1B) greatly influenced soil mechanical resistance. Interactions of year and tillage on soil resistance from 4 to 30 cm were significant ($P \leq 0.05$).

Method of tillage greatly affected soil mechanical resistance from 2 to 30 cm (2006) or 2 to 25 cm (2007) soil depth (Figure 1B). Averaged across measurement dates, bahiagrass termination dates, and soil depths, disk alone resulted in the greatest (1.7 MPa) soil mechanical resistance while the treatment of disk plus paratill plus strip-till had the lowest (1.2 MPa) soil mechanical resistance in 2006. In 2007, the strip-till and disk showed the greatest (2.4 MPa) soil resistance, while the disk plus moldboard plow treatment showed the lowest (1.9 MPa) soil resistance (Figure 1B). It is not surprising that strip till had the greatest soil resistance because the soil resistance data were collected between rows rather than in row. Results of soil mechanical resistance response to tillage in the present study are similar to earlier reports (Akinci *et al.*, 2004; Lampurlanés and Cantero-Martínez, 2003) where sub-soiling reduced soil penetration resistance as compared to minimum tillage and no-tillage. Soil mechanical resistances were much greater in 2007 than in 2006 at all depths measured (Figure 1). Averaged across dates of bahiagrass termination, tillage methods and soil depths, soil mechanical resistances in 2006 and 2007 were 1.4 and 2.2 MPa, respectively (Figure 1). Differences in soil resistance between the two years were mainly associated with precipitation and amount of irrigation as described before because the experiments in the two years were in the same field. Both precipitation and amount of irrigation in 2007 were less than those in 2006 (Table 1) because the experimental locations in the southeast United States faced water shortage in the severe drought year of 2007.

Bahiagrass termination date did not affect peanut stand, although tillage method did influence stand during 2007. In-row peanut stand count ranged from 13.3 to 14.8 plants/m across all treatments (Table 2). Averaged across bahiagrass termination dates, the disk plus moldboard plow (14.4 plants/m) had a higher stand count than the disk plus paratill plus strip-till or disk (13.6 plants/m) tillage methods, while all other paired tillage comparisons did not differ in peanut stand.

Leaf greenness, measured with a SPAD meter, is an indicator of plant N status (Chapman and Baretto, 1997) for most field crops. During early growth (55 DAP) at Quincy in 2007, peanut plants grown in the fall-terminated bahiagrass had significantly higher SPAD values, which are an indication of higher levels of chlorophyll than peanuts grown in the spring-terminated bahiagrass ($P \leq 0.05$, Table 2). Averaged across the tillage methods, leaf chlorophyll values of the fall and spring termination treatments were 35.6 and 33.4, respectively. At 74 DAP, however, there was no difference between the two bahiagrass termination dates in chlorophyll values. Leaf greenness did not differ among the six tillage methods. Neither bahiagrass termination timing nor tillage method affected canopy ground coverage at 74 DAP (Table 2). These results indicated that bahiagrass termination date and tillage method did not affect peanut leaf chlorophyll status or shoot growth.

In 2006, bahiagrass termination date (data not shown) and tillage method (Table 3) did not affect peanut yield regardless of location. In 2007, the effect of bahiagrass termination date on yield was not significant, but tillage did influence yield ($P \leq 0.05$). Pod yield was not affected by the interaction of bahiagrass termination date and tillage method (data not shown). Among the six tillage treatments in 2007, only the strip-till plus 45 N treatment had

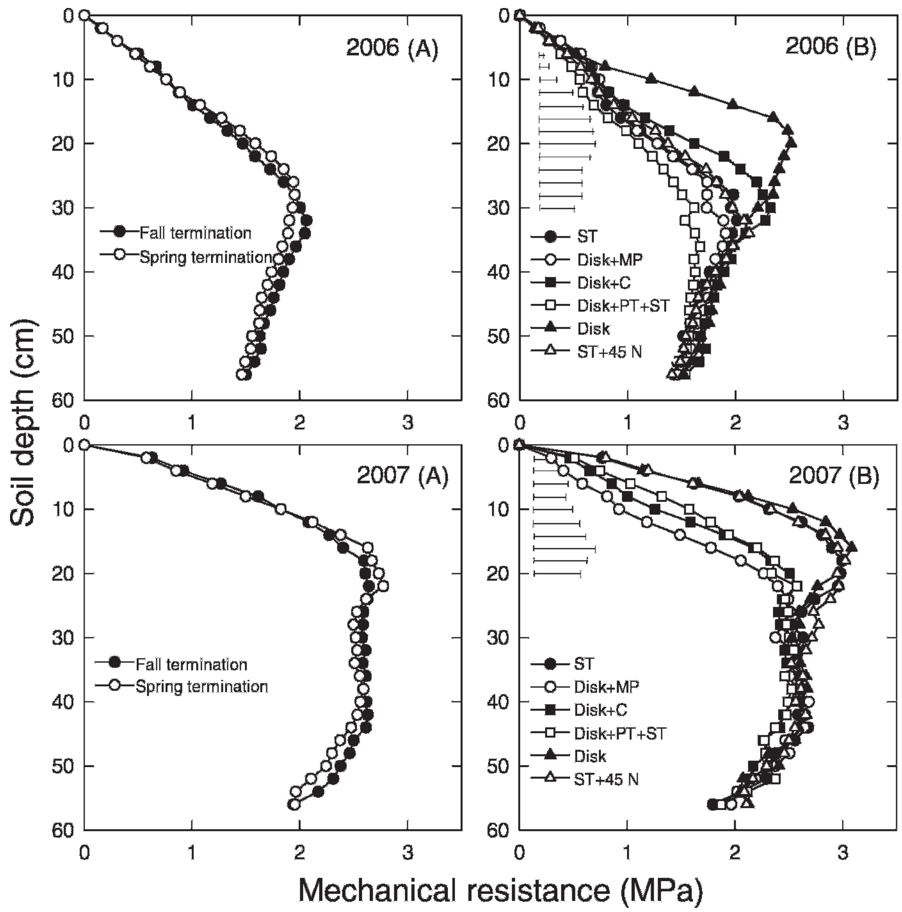

Fig. 1. Soil mechanical resistances for (A) plots of fall vs. spring terminated bahiagrass and (B) the six tillage types of strip till (ST), disk plus moldboard plow (Disk+MP), disk plus chisel (Disk+C), disk plus paratill plus strip till (Disk+PT+ST), disk, and strip till plus 45 N (ST+45 N) in 2006 and 2007. Data are means of four times of measurements in Quincy, FL. Horizontal bars indicate Fisher's protected at $P \leq 0.05$.

lower yield than the disk plus moldboard plowing treatment at Marianna and the disk tillage alone had lower yield than the strip-till and the disk plus moldboard tillage at Quincy (Table 3). When pooled over the both treatment factors, peanut yields in Marianna and Quincy were 4790 and 4320 kg/ha, respectively, in 2006 and 4690 and 5430 kg/ha, respectively, in 2007. Dickson and Hewlett (1989) and Hagan *et al.* (2003) reported increased pod yield compared to continuous peanut when peanut was planted after bahiagrass. We speculate that the high yields of peanut in the present study with irrigation are mainly attributable to the previous 2-yr bahiagrass (Brenneman *et al.*, 1995; Wright *et al.*, 2004). This has been attributed to the bahiagrass improving soil quality

Table 2. Peanut stands recorded 19 days after planting (DAP), SPAD readings measured 55 and 74 DAP, and canopy ground coverage at 74 DAP responses to the six tillage methods in 2007 at Quincy, Florida.[a]

Tillage	Stand count	SPAD reading		Ground coverage 74 DAP
		55 DAP	74 DAP	
	plants/m row			%
Strip-till	13.7	34.5	35.8	62.1
Disk plus moldboard plow	14.4	34.4	35.7	63.1
Disk plus chisel	13.7	32.9	35.5	63.8
Disk plus paratill plus strip-till	13.6	35.8	35.8	65.0
Disk	13.6	33.4	35.8	53.8
Strip-till plus 45 N	14.1	36.1	35.9	65.6
LSD0.05	0.8	NS[b]	NS	NS

[a]Data are means of the two bahiagrass termination dates.
[b]NS = not significant.

Table 3. Effect of tillage method on peanut yield at Marianna and Quincy, Florida.[a]

Tillage	Marianna			Quincy		
	2006	2007	Mean	2006	2007	Mean
	kg/ha					
Strip-till	4810	4430	4620	4410	5660	5040
Disk plus moldboard plow	4440	4930	4680	4980	5640	5300
Disk plus chisel	4870	4820	4850	4310	5220	4770
Disk plus paratill plus strip-till	4930	4740	4840	4200	5380	4790
Disk	4950	4830	4890	4140	5160	4680
Strip-till plus 45 N	4730	4350	4540	3870	5530	4700
LSD0.05	NS[b]	527		NS	460	

[a]Data are means over bahiagrass termination dates.
[b]NS = not significant.

(Katsvairo *et al.*, 2006) and mitigating disease and insect pressure (Boman *et al.*, 1996).

Peanut yield did not differ between the fall and spring terminated bahiagrass at the two locations in either year even though some differences were detected in peanut leaf greenness at early growth stage (Table 2). Averaged across tillage methods and years, peanut yields of the fall- and spring-terminated bahiagrass were 4690 and 4790 kg/ha, respectively, at Marianna and 4850 and 4900 kg/ha, respectively, at Quincy. These results did not support the hypothesis that spring-terminated bahiagrass might negatively affect peanut yield due to a delay release of N from bahiagrass residue decomposition. In the southeast United States, high humidity and precipitation with a long growing season accelerate plant residue decomposition, and resulted in no difference between the fall- and spring-terminated bahiagrass in peanut yield. Thus, farmers who decide to strip till peanuts into bahiagrass have an extended window or flexibility from fall to spring to terminate bahiagrass without any reduction in peanut yield.

Although considerable differences in energy consumption would be among the six tillage methods (Borin *et al.*, 1997; Sijtsma *et al.*, 1998), peanut yield of all tillage treatments was comparable in 2006 (Table 3). However, when pooled across bahiagrass termination dates in 2007, peanut following the disk plus moldboard plow yielded more than peanut in the strip-till plus 45 N treatment in Marianna. At Quincy, peanut in the strip till or disk plus moldboard plow system had higher yields than the disk alone at this location (Table 3). Among tillage methods, strip till was the least destructive conservation tillage method because it disturbed only 20% of soil surface as compared to complete soil disturbance with the disk plus moldboard plow. Peanut yield of the single strip-till treatment (4830 kg/ha) equaled or exceeded that of other tillage methods (4800 kg/ha) averaged across years and locations. Therefore, in sod-based peanut-cotton rotation systems in the Southeast, strip tillage can reduce inputs, conserve soil, and increase profitability.

Averaged across years, locations and bahiagrass termination dates, peanut yield ranged from 4620 to 5000 kg/ha among the six tillage treatments (Table 3). Johnson *et al.* (2001) tested peanut yield response to conventional, reduced, and minimum tillage in a peanut-cotton rotation in Georgia and found that over 5 yr there were no differences in peanut yield among tillage systems. Tubbs and Gallaher (2005) compared peanut yield of five tillage treatments in Florida and suggested that strip tillage systems, with proper management provide an advantage in yield over conventional tillage systems. Faircloth *et al.* (2006) reported similar or higher peanut yield in strip tillage compared to conventional tillage systems, regardless of irrigation. Consistent with other studies in the southeast United States (Faircloth *et al.*, 2006; Johnson *et al.*, 2001; Tubbs and Gallaher, 2005), our results indicated minimal yield response of peanut following bahiagrass to tillage systems. Additionally, our results revealed that early season N availability was not a limiting factor for peanut yield in sod-based rotation system with strip till in either the fall or spring terminated bahiagrass (Table 3).

Previous studies have suggested that although soil penetration resistance in minimum tillage or no-tillage is greater than soil resistance in subsoil tillage, an increase in soil strength under no-tillage does not affect barley (*Hordeum vulgare* L.) root growth (Lampurlanés and Cantero-Martínez, 2003) or cotton yield (Akinci *et al.*, 2004) in well-structured soils. In the present study, we found that tillage method and year affected soil mechanical resistance (Fig. 1). However, less soil resistance did not translate into effect on peanut yield (Table 3), revealing adequate soil characteristics for peanut production under the sod-based rotation. Therefore, growers can chose a simple conservation tillage method such as strip till in sod-based rotation to reach their yield goal in peanut production, decrease input costs by reducing field operations, and further increase profitability.

Bahiagrass termination date and tillage method as well as the interaction of the two factors did not affect %SMK, %SS, %OK, or %hulls in 2006 (data not shown). In 2007, tillage method had no effect on other peanut market grade variables except for %SS in Marianna where only the disk plus paratill plus strip-till (7.0%) had greater ($P \leq 0.05$) %SS than the disk plus chiseled treatment (5.7%). The response of peanut market grade characteristics to tillage in our study is similar to a report of Johnson *et al.* (2001) who found tillage did not affect percentage of total SMK, immature kernels or damaged kernels of peanut. In the present study, there were no differences between the two locations in %SMK, %SS, %OK or %hulls (data not shown).

Conclusions

Results from this study indicate that peanut yield and market grade characteristics most likely will not affected when bahiagrass is terminated in spring or fall in sod-based rotations. Application of N fertilizer did not increase peanut yield when peanut was strip tilled into bahiagrass. Therefore, farmers have considerable flexibility in terminating bahiagrass prior to planting peanut. Although differences in soil mechanical resistance among tillage methods were detected, differences in peanut yield or market grade characteristics were not associated with soil resistance in sod-based rotations. Peanut yield in strip tillage equaled or exceeded peanut yield in all other tillage systems including conventional tillage, suggesting that strip tillage in sod-based cropping systems provides a suitable alternative to traditional conventional tillage systems.

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