

DEVELOPING A CONSERVATION TILLAGE SYSTEM FOR PEANUT

W. JAMES GRICHAR, A. J. JAKS, AND BRENT A. BESLER*

SUMMARY

Three field studies were conducted in Atascosa and Frio Counties to evaluate the reduced tillage system with the full-tillage system for peanut production. The full-tillage system produced the highest yield at both locations while reduced tillage systems produced lower yields. At the Atascosa County location, the strip-tillage system produced the lowest yield due to difficulty in digging the plots. The digging blades never did properly penetrate the soil surface and a lot of peanuts were cut off and not harvested. With the strip-tillage system it may be necessary to adjust the blades at a different angle to better facilitate digging. In a study to evaluate herbicide systems under the strip-tillage system, excellent weed control was obtained with Sonalan plus Strongarm applied preemergence (PRE) and Sonalan applied PRE followed by Cadre, Pursuit, or Strongarm applied postemergence (POST).

INTRODUCTION

The use of conservation tillage systems have become common practice in other crops but have been slow to develop in peanut, especially in the southwest. In corn, grain sorghum, and cotton increased revenues of \$30 to \$40/A have been realized. In earlier work on peanut, soil-borne diseases never developed in no-till or reduced tillage systems. However, weeds have always been a problem with these tillage systems. Postemergence herbicides have provided good control of annual grasses and broadleaf weeds but weed control has been a season long problem since many of the postemergence herbicides provided no residual control.

MATERIAL AND METHODS

Field studies were conducted at the Greg Tschirhart Farm near Pearsall to compared full-tillage (flat broke, disced, and bedded), minimum-tillage (disked and bedded), and strip-tilled (12-14" bed preparation) production systems. After each system was prepared, peanuts (Tamrun-96) were planted at 90 lbs/A and Sonalan plus Pursuit was applied preemergence (PRE) to control any weeds that emerged. Select was applied postemergence (POST) to control annual grasses that emerged mid-season. Peanuts were dug 129 day after planting and combined approximately 5 days later.

Field studies were also conducted at the Bill Slomchinski Farm near Pleasanton to compare herbicide systems under strip-tillage system. Sonalan applied alone or in combination with Cadre, Dual, Outlook, Pursuit, Strongarm, or Valor was compared for weed control throughout

the growing season. Herbicides were applied using a smallplot, 2 row CO₂ backpack sprayer equipped with three SS-11002 flat fan nozzles per 2 rows. Nozzles were spaced approximately 18" apart and operated at 28 psi to deliver 20 GPA. Visual weed control and crop injury ratings were made at various intervals during the growing season, on a scale of 0=no injury or control to 100=complete control or plant death. Also in this area, four different tillage systems were compared for production costs and peanut yield and quality. The full-tillage system consisted of 2 trips with the off-set disc, flat-breaking, disc-bedding, planting, and followed by a herbicide application (6 total trips). The reduced-tillage system consisted of 2 trips with the off-set disc, disc-bedding, planting, and followed by a herbicide application (5 total trips). The Terra-till system consisted of 2 trips with the off-set disc, terra-tilling, planting, and followed by a herbicide application (5 trips). The strip-tillage system consisted of strip-tilling, spraying of Touchdown, planting, and followed by a herbicide application (4 trips). Tamrun-96 was planted at the rate of 90 lbs/A and dug when 125 days old.

RESULTS AND DISCUSSION

At the Tschirhart farm, although there was no significant differences in yield between tillage systems, numerically, the full-tillage system produced the highest yield (3993 lbs/A) while the minimum-tillage system produced the lowest yield (2816 lbs/A). The strip-tillage system produced 3384 lbs/A (Table 1). No difference in grade (SMK+SS) was noted between the full- and strip-tillage systems while the minimum-tillage system produced the lowest grade. When dollar value were compared, the full-tillage system produced over \$700/A while the strip-tillage system produced a net value of almost \$600/A. The minimum-tillage system produced a net value of over \$480/A. With these differences in yield and grade between tillage systems, it is clear that the full-tillage system was more profitable.

At the Slomchinski Farm, four different tillage systems were compared for peanut yield and net return. Due to difficulties in digging, the strip-tillage system produced the lowest yield (Table 2). The angle and depth of the knives on the digger were not changed when this system was dug after some of the other systems and as a result peanuts were cut off and remained in the ground. When the reduced- and Terra-tilled systems were compared with the full-tillage system, no differences in yield were noted. Grades (SMK+SS) were lower with the strip-tillage system and as a result of the reduced yield, the net dollar value per acre was lower under this system.

A comparison of herbicide systems showed that Sonalan applied in combination with Strongarm applied preemergence (PRE) or Sonalan applied PRE followed by Cadre, Pursuit, or Strongarm applied postemergence (POST) controlled at least 94% Texas panicum and yellow nutsedge (Table 3). Sonalan in combination with Dual, Outlook, or Valor applied PRE controlled less than 80% Texas panicum and no greater than 75% yellow nutsedge.

ACKNOWLEDGMENTS

The authors wish to express thanks to the Texas Peanut Producers Board for their support and continued interest in this research effort. We would also like to thank our cooperators, Greg Tschirhart and Bill Slomchinski for their interest and effort and time as well. A special thanks to Bill Klesel, Dwayne Drozd, and Kevin Brewer for their help in plot maintenance and peanut harvest.

Table 1. Comparison of Peanut Tillage Systems, Tschirhart Farms.

Tillage system	Yield (Lbs/A)	Grade			Net \$ value/A
		SMK+SS	DK	OK	
Full-tillage	3993	70.8	0.2	4.7	711.22
Minimum-tillage	2816	66.6	0.2	6.9	482.56
Strip-tillage	3384	71.3	0	4.2	594.31
LSD (0.05)	2105	3.0	0.8	1.3	

Table 2. Comparison of Peanut Tillage Systems, Bill Slomchinski Farms.

Tillage system	Yield (Lbs/A)	Grade SMK+SS	Gross \$/A	Operation Costs \$/A	Net \$/A
Full-tillage	3520	76	640.04		596.37
Off-set disc(2X)				15.20	
Flat-breaking				13.00	
Disc-bed				4.85	
Plant				5.63	
Spray herbicide				3.32	
Total				42.00	
Reduced-tillage	3140	76	572.59		543.59
Off-set disc(2X)				15.20	
Disc-bed				4.85	
Plant				5.63	
Spray herbicide				3.32	
Total				29.00	
Terra-till	3460	76	629.39		595.24
Off-set disc (2X)				15.20	
Terra-till				10.00	
Plant				5.63	
Spray herbicide				3.32	
Total				34.15	
Strip-till	2320	74	417.27		395.00
Strip-till				10.00	
Spray Touchdown				3.32	
Plant				5.63	
Spray herbicide				3.32	
Total				22.27	
LDS (0.05)	425	1	120.80		74.60

Table 3. Evaluation of Herbicide Systems for Strip –Tillage Production Systems.

Herbicide system	Rate Product/A	Appl timing ¹	Weed control (%)		Peanut yield Lbs/A
			Texas panicum	Yellow nutsedge	
Check	-	-	0	0	3296
Sonalan	1.0 pt	PRE	67	55	3104
Sonalan+Dual	1.0+1.33 pt	PRE	65	74	2715
Sonalan+Outlook	1.0+1.33 pt	PRE	63	47	3104
Sonalan+Valor	1.0 pt+2.0 oz	PRE	76	64	2541
Sonalan+Valor	1.0 pt+3.0 oz	PRE	84	61	3474
Sonalan+Strongarm	1.0 pt+0.45 oz	PRE	94	98	3626
Sonalan/ Strongarm	1.0 pt/ 0.3 oz	PRE/POST	98	98	3986
Sonalan/Pursuit	1.0 pt/ 1.44 oz	PRE/POST	99	100	3325
Sonalan/Cadre	1.0 pt/ 1.44 oz	PRE/POST	98	100	3906
LSD(0.05)			41	32	1031

¹ Abbreviations: PRE,preemergence; POST,postemergence.