FULL SEASON AND DOUBLE CROPPED COTTON AS AFFECTED BY TILLAGE, STARTER FERTILIZER, IN-ROW SUBSOILING AND NEMATICIDE, 1-YEAR RESULTS

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This study is being conducted at the Monroeville Experiment Field on a Lucedale sandy loam soil. Wheat is used for a winter cover crop for both the full season and double cropped cotton, but the double cropped cotton is planted after wheat harvested for grain. Treatments consist of tillage (disk-plow-disk and no tillage), subsoiling (in-row 12 inches deep and no subsoiling), starter fertilizer (none and 100 lb./acre 22-20-3-3. N-P_2O_5-K_2O and nematicide (none and 1 lb./acre soilbrom, EDB). With the non-subsoil treatment, EDB is applied (9 inches deep) with anhydrous ammonia knives just prior to planting and starter fertilizer is applied 2 inches deep and 2 inches beside the seed (2 x 2) at planting. With the subsoil treatments, starter fertilizer and EDB are applied at planting; the EDB is applied at the bottom of the subsoil track and the starter fertilizer is dropped directly behind the subsoil shank and is probably mixed with the upper 10 inches of soil.

Initial soil pH was adequate and soil test P and K were high. Sidedress N was applied at a rate of 90 lb./acre. Recommended pesticides were used to control weeds and insects. The experimental area was not irrigated.

Results and Comments for 1983

Full Season Cotton

Early season growth was not affected by tillage or subsoiling, but was 77% greater when starter fertilizer was applied (Table 1). Applying EDB with the starter did not improve early season plant weights. Plant populations ranged from 22,000 to 46,000 plants per acre. The plant populations were not affected by tillage or starter fertilizers but were much lower for subsoiled than not subsoiled, and were also reduced by EDB in the non subsoiled plots. The primary effect of treatments on early season plant height was due to the starter fertilizer. The starter fertilizer increased the early season plant height 14% over the no starter treatments.

Table 1. Weight, population, and height of full season cotton 9 weeks after planting as affected by starter fertilizer, EDB, tillage and subsoiling.

Treatmept					Plant Height			
Starter'		Dry	Population[2]		Till		No Till	
fertilizer	EDB	weight	SS	NSS	SS	NSS	SS	NSS
	lb./acre	lb./acre	1000/acre		----------inches----------			
None	0	1130	22	46	29	26	28	28
Yes	0	1995	30	*46*	30	33	33	31
Yes	1	2030	30	33	29	32	31	31
LSD 10		470	9		4			

'Starter fertilizer was 100 lb./acre of 22-20-3-3.
[2]SS= subsoil and NSS= not subsoiled.

Seed cotton yields were affected by starter fertilizer, tillage, and subsoiling (Table 2). The starter fertilizer improved yields in each tillage and subsoiling system. Average yield increase due to the starter was 19% (300 lb./acre seed cotton). The 2 X 2 placed starter appeared to be as effective as the subsoil applied starter. No tillage resulted in 13% higher yields than conventional tillage, but in-row subsoiling did not improve yields within either tillage system.

Table 2. Seed cotton yield and percentage of cotton picked at first and second picking for full season cotton as affected by starter fertilizer, soil brome, tillage, and subsoiling.

starter[1]		Till		No-till		1st picking		2nd picking	
fertilizer	EDB	SS[2]	NSS	SS	NSS	Till	No-till	Till	No-till
	lb/A	--seed cotton, lb./acre				----------%----------			
None	0	1530	1580	1480	1720	083	081	017	019
Yes	0	1710	1820	1990	2010	088	085	012	015
Yes	1	1580	1680	2040	2000	086	084	014	016
FLSD (0.12)		190				2.7		2.7	

'Starter fertilizer was 100 lb./acre of 22-20-3-3.
[2]SS= subsoiled and NSS= not subsoiled.

Double Cropped Cotton

Early season plant weights 6 weeks after planting were more than doubled by the starter fertilizer, and averaged 31% higher for the non subsoiled than subsoiled treatments (Table 3). Neither EDB nor tillage had an effect on plant weights. Plants were also 30% taller with than

without the starter fertilizer. EDB plus starter resulted in taller plants than starter alone in the conventional till but not in the no-till system. No tillage resulted in taller plants only when EDB was not applied. Subsoiling did not affect plant height.

Table 3. Plant weight, population, and height of cotton planted after wheat harvest as affected by starter fertilizer, EDB, in-row subsoiling, and tillage.

Starter[1] fertilizer	EDB	Weight SS[2]	Weight NSS	Population Till SS	Population Till NSS	Population No-till SS	Population No-till NSS	Height Till	Height No-till
	lb./acre	lb./acre		1000/acre				inches	
None	*0*	*140*	107	56	58	77	*44*	12	*14*
Yes	*0*	230	320	62	59	53	60	**15**	20
Yes	**1**	230	360	**51**	58	**60**	**65**	19	19
FLSD (0.10)		70		16				3	

[1]Starter fertilizer was 100 lb./acre of 22-20-3-3.

[2]SS= subsoiled and NSS= not subsoiled.

Seed cotton yields (Table 4) in each tillage and subsoil system were increased by the starter fertilizer (26%, 468 lb./acre). The EDB increased yield above that obtain with the starter alone in both tillage systems (14%, 326 lb./acre) but only with the subsoil treatment. Nematode populations, however, were not high enough to be of practical importance. The only tillage effect on yields occurred within the subsoil system where no till plus starter alone and starter plus EDB resulted in higher yields than conventional tillage with starter and starter plus EDB. The highest yields occurred with no till subsoiled plus starter fertilizer (2700 lb./acre) and no till subsoiled plus starter and EDB (2920 lb./acre).

Table 4. Seed cotton yield, boll opening (15 October) 2 weeks prior to first picking, and percentage yield with first picking as affected by starter fertilizer, EDB, subsoiling, and tillage.

Starter fertilizer	EDB	Seed cotton yield Till SS	Seed cotton yield Till NS	Seed cotton yield No-till SS	Seed cotton yield No-till NS	Boll opening Till SS	Boll opening Till NS	Boll opening No-till SS	Boll opening No-till NS	1st picking SS	1st picking NS
	lb./acre	lb./acre				%					
No	0	1700	1790	1780	*1840*	18	10	*10*	3	*82*	71
Yes	*0*	2070	1980	**2700**	2220	**60**	56	58	*48*	93	91
Yes	1	2500	2280	2920	2230	**56**	62	**56**	*48*	93	93
FLSD (0.10)		210								2	

Starter fertilizer had a tremendous effect on maturity (Table 4). Two weeks prior to the first picking, 58% of the bolls were opened when starter fertilizer was applied and only 10% when starter was not applied. This difference was reflected in percentage of cotton harvested at the first picking (77 and 92%) for the no starter and starter treatment, respectively. The EDB did not effect maturity. There was a tillage by subsoiling interacting effect on maturity. Two weeks prior to the first picking, the non-subsoiled, no-till cotton averaged 10% less boll openings than the other treatments.