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Experiments have demonstrated benefits from the use of winter cover crops (2). These are added nitrogen from a legume, improved soil tilth as a result of the additional organic material and "buffering" of herbicides due to the added organic material near the soil surface. One major disadvantage from using winter cover crops in the production of cotton is that the turned-under green vegetation often does not have time to decompose properly before time to plant cotton. Management of vegetative cover in the spring is especially critical in areas where cotton is planted on beds, because obtaining a good stand may require rainfall to "settle" the beds before planting. Studies also have shown economic benefits from yearly fall subsoiling of soils usually selected for cotton production in the Delta of Mississippi (3,4). The combination of fall practices, such as stalk destruction, subsoiling and seeding a winter cover crop, often is hampered severely by the normal rainfall pattern in the mid-South.

Studies were initiated in the fall of 1977 with the objective of evaluating the influence of winter cover crops on seedbed preparation and cotton yield and on the application and performance of selected herbicides.

Materials and Methods

Split plot experiments with four replications were conducted for five years (1978-82) on a Bosket silt loam soil at Stoneville, Miss. Main plots treatments were wheat, vetch and winter weeds (a conventional treatment) as cover crops. Main plots were 20 rows, 40 inches wide by 40 feet long. Wheat and vetch were seeded with a hand-carried rotary seeder near the time of defoliation each year. The wheat and vetch seed did not germinate in 1978 and 1979, and the plots were disked lightly shortly after cotton harvest to enable the seed to germinate.

The four-row subplots were a non-herbicide check and application of (1) Roundup® (glyphosate) at 1.34 lbs a.i./acre applied to the cover crop (PPF) and Cotoran® (fluometuron) at 1.5 lbs a.i./acre preemergence (PRE); (2) Roundup applied PPF, Treflan® (trifluralin) at 0.75 lbs a.i./acre applied to the seedbed and soil incorporated shallow (PPI) and Cotoran PRE; (3) Cotoran PRE and (4) Treflan PPI followed by Cotoran PRE. Plots were maintained in the same location each year. The PPI treatments were soil incorporated with a rolling cultivator in 1978, 1979 and 1981, and with a bed conditioner in 1980 and 1982.

The entire area was subsoiled with a parabolic subsoiler each winter at 45° to the old rows. This practice was estimated to disturb about 50% of the soil surface area. It also was estimated that this activity reduced the cover crop stand by 50%. The recommended amount of fertilizer (80 to 120 lbs nitrogen/acre/yr as a urea-ammonium nitrate solution) was knifed into the soil on 20-inch centers over the entire area at or near the time of bedding. Control of insects and diseases was accomplished with recommended practices. Details of seedbed preparation and production operations are listed in Table 1.

All PPF, PPI and PRE herbicides were applied broadcast in water at 20 gal/acre, using a tractor-mounted boom sprayer. Postemergence herbicides were applied in water at 20 gal/acre broadcast volume to a 20-inch band centered on the row, using a cultivator equipped with spray shields and two nozzles per row. Over-the-top (OT) treatments (1980, 1981) were applied broadcast as described above.

Postemergence herbicides and broadcast rates were Probe® (methazole) at 0.75 lb a.i./acre + MSMA at 2.0 lbs a.i./acre in 1978; Probe at 0.75 lb a.i./acre + MSMA at 2.0 lbs a.i./acre and Caparol® (prometryn) at 0.5 lb a.i./acre + MSMA at 2.0 lb a.i./acre in 1979; RO 13-8895 at 0.375 lb a.i./acre (OT to Treatment 1 only) and Premerge® (dinoseb) at 1.5 lbs a.i./acre in 1980; MSMA at 2.0 lbs a.i./acre (Treatment 1 only), Poast® (sethoxydim) at 0.25 lb a.i./acre (OT) and Premerge at 1.5 lbs a.i./acre in 1981 and Premerge at 1.5 lbs a.i./acre + MSMA at 2.0 lbs a.i./acre and Premerge at 1.5 lbs a.i./acre in 1982.

Estimates of winter vegetation were made in April, 1978-81 and in November, 1981 by counting individual plants by species on five 1-by-3-ft areas randomly placed within each main plot. All vegetative plant material above the soil line in randomly selected 1-by-3-ft areas was removed by hand each spring to estimate the amount of plant residue for each cover crop area. These samples were dried to a

constant weight in a forced air drier at 120° F, and the dry weight per acre was calculated.

Beds were formed with a conventional four-row disk hipper on the indicated dates (Table 1). The experiment was drill planted to 'DES 56' cotton with a John Deere 7100® four-row planter. All row middles were cultivated on the dates indicated with a two- or four-row cultivator equipped with spray shields positioned 9 inches from either side of the drill row.

Cotton stand was determined by counting plants from one row in each plot. Plants per acre were calculated from these counts. Evaluation of summer weed control was made by counting weed plants by species and by determining the hoe time required to remove summer weeds. Weed counts were made two or three weeks after cotton emergence on two randomly selected 1-x-3-ft areas centered on row two of each plot. These counts were combined are reported as plants per 6 s The time required to hoe the center rows of each plot determined five to six weeks a cotton emergence and is repo as hours per acre.

Cotton yield was determine harvesting the two center row each plot with a spindle pi adapted to harvest small plots. yields were converted to poun seed cotton per acre.

Results and Discussion

No advantage in seedbed preparation was observed when Roundup was applied to the cover crops (Subplot Treatments 2 and 3) before beds were formed. This may have been caused by the 50% reduction in winter vegetation that resulted from the subsoiling operation. Wheat and winter weed plants were dead from the Roundup treatments when beds were formed, even though only five to 23 days elapsed from the time of application of Roundup until hipping (Table 1). Vetch plants were suppressed (no new growth after Roundup application) and were "off-color". Areas treated with Roundup and those not treated had no living plants at planting.

The cover-crop residue did not interfere with bedding, planting or herbicide application. The incorporation operation with the bed conditioner was not affected by wheat and vetch residue, but considerable time was lost removing trash from the tines of the rolling cultivator.

Total green weights of winter vegetation in April ranged from 1.7 tons/acre in 1980 to 7.0 tons/acre in 1979 for wheat, from 2.7 tons/acre in 1980 to 6.7 tons/acre in 1979 for vetch and from 0.6 tons/acre in 1982 to 1.7 tons/acre in 1981 for winter weeds. Total dry weights ranged from 0.54 to 1.42 tons/acre for wheat, 0.57 to 1.31 tons/acre for vetch and 0.30 to 0.70 tons/acre for winter weeds (Table 2).

The predominant winter weed on all cover crop areas in 1978, 1979 and 1980 (Table 2) was hairy bittercress (*Cardamine hirsuta* L.). Henbit (*Lamium amplexicaule* L.) replaced bittercress as the predominant species in 1981 (both spring and fall), but bittercress plants still were present in large numbers. This was probably due to specific environmental conditions favoring henbit. The herbicide treatments changed neither the species composition nor the weight of subsequent winter vegetation in this study.

Cotton stands were higher in the winter weed plots each year and were significantly higher than in the wheat and vetch plots in three of the five years (Table 3). The five-year average cotton stand was highest on the winter weed plots, stands following wheat were significantly less than those following winter weeds, and stands following vetch were significantly less than those following wheat or winter weeds. No logical explanation can be given for these differences because field observation indicated no differential influence on stand from insects or seedling disease. It appears that the low stands for wheat in 1978 and for vetch in 1982 contributed to the low cotton yields on these areas (Table 4).

Cotton stands averaged over the five years were not affected by herbicide treatment (Table 3).

The three cover crops did not affect the hoe time require remove summer weeds from (Table 5). All herbicide treatm required less hoe time than di check (bed only), but no signif differences (four-year aver occurred among individual h cide treatments.

Populations of redroot pig (*Amaranthus retroflexus L).*, pr sida (*Sida spinosa* L.) and an grasses---broadleaf signalg (*Brachiaria platyphylla* (Gr Nash), barnyardgrass (*Echino crusgalli* (L.) Beauv.) and brow panicum (*Panicum fasciculi* Sw. var. *reticulatum* (Torr.) Be were not statistically different fo ing any cover crop (Table 6). 1981 and four-year average po tions of annual morningg "(pitted (*Ipomoea lacunosa* L. leaf (*I. hederacea* (L.) Jacq.) entireleaf (*I. hederacea* var. *integriuscula* Gray)" were h following vetch (Table 6). No an morningglory plants were obs in 1979. Populations of redroo weed on all herbicide-treated were lower than for the check only) except for 1981, an morningglory populations lower in two of four years prickly sida populations were l in three of five years. The 1980 and 1981 and the five average populations of an grasses were lower on herbi treated plots than on the check annual grass population in

Table 1. Production operations used in a study of the influence of winter cover crops on seedbed preparation and cotton yield and on the application and performance of selected herbicides, MAFES Delta Branch, 1977-1982.

Operation	1977	1978	1979	1980	1981	1982
	(month/day)					
Cut stalks	9/6	10/16	12/3	10/23	10/16	--
Disk	10/17 (2)	10/26	--	--	--	--
Disk	10/28	--	--	--	--	--
Subsoil	--	10/26	12/5	12/4	--	3/12/82
Glyphosate[1]	--	4/14	4/17	4/24	4/22	4/27
Wheat height (in.)	--	(15)	(24)	(16)	(36)	(24)
Vetch height (in.)	--	(18)	(20)	(18)	(20)	(12)
Winter Weeds height (in.)	--	(10)	(8)	(10)	(12)	(10)
Lip	--	4/19	5/10 (2)	5/6	4/28 (2)	5/5 (2)
Lehip						
(Early)	--	--	5/10	--	--	--
(For planting)	--	5/15	5/16	5/29 (2)	5/11	5/18 (2)
Herbicide Incorporation						
Rolling Cultivator	--	5/15	5/16	--	5/11	--
Bed Conditioner	--	--	--	5/29	--	5/18
Plant 'DES 56'	--	5/16	5/17	5/30	5/11	5/18
Postemergence Herbicides						
1st Directed application	--	6/14	6/11	7/1	6/4[3]	7/6
Cotton height (in.)	--	(5-8)	(4)	(8-12)	(2-5)	(8-20)
2nd Directed application	--	6/27	6/27	--	6/23	7/15
Cotton height (in.)	--	(10-14)	(8-11)	--	(7-10)	(12-24)
Over-the-top Application	--	--	--	6/18[2]	6/19	--
Cotton height (in.)	--	--	--	(3-5)	(7-10)	--
Cultivations						
1st	--	6/13	6/11	6/18	6/2	6/1
2nd	--	6/14	6/27	7/3	6/4	6/15
3rd	--	6/24	--	7/30	6/15	6/25
4th	--	--	--	--	6/23	7/6
5th	--	--	--	--	6/30	7/15
6th	--	--	--	--	7/14	--
Dope	--	6/30	6/5	7/25	7/6	--
	--	--	--	--	8/4	--
Defoliate	--	9/18	10/11	9/30	9/25	9/15
Harvest	--	9/29	11/6	10/15	10/6	10/18
	--	--	11/19	--	--	--

[1] Applied to subplot treatments 2 and 3 only at 1.34 lbs a.i./A (see Table 3).
[2] Applied grass herbicide; to treatment 1 only in 1980 and to all treatments in 1981.
[3] Applied only MSMA to treatment 1 in 1981.

was reduced with treatments of Treflan PPI followed by Cotoran PRE but not with Cotoran PRE. Annual counts of grass plants did not differ when Treflan was incorporated with a rolling cultivator (1978, 1979, 1981) or a bed conditioner (1980, 1982). This is in agreement with Alston, et al.(1).

The only significant cover crop by herbicide treatment interaction effect on annual grass control occurred in 1982 (Table 7). The annual grass population when no herbicides were used was largest when wheat was the winter cover crop.

Significant cover crop by herbicide treatment interaction effects on seed cotton yields occurred in 1979, 1982 and the five-year average. All herbicide treatments in 1979 resulted in higher yields with wheat as the cover crop than from the check (Table 8).

Yields from herbicide-treated vetch cover-crop plots in 1982 were lower than from wheat or winter weeds except for the Roundup®-bed-Treflan®-Cotoran® treatment (Table 9). Yields following all herbicide treatments were higher than from plots where herbicides were not applied.

The 1978-1982 average yields were higher from herbicide-treated plots than from plots where herbicides

were not applied (Table 10). The highest five-year average yield from the check (no herbicides) was from plots where winter weeds were the cover crop. The highest five-year average yield was from the Roundup-bed-Treflan-Cotoran plots.

Summary

Cotton was grown after three cover crops (wheat, vetch, winter weeds) for five years (1978-1982). The winter vegetation was characterized by indigenous species and was not altered by the herbicide treatments used. The winter vegetation did not interfere with bedding or planting operations, but the residue from wheat and vetch greatly interfered with soil incorporation of herbicides when using a rolling cultivator. Preplant application of Roundup® to the cover crops did not make it easier to perform subsequent preplant tillage operations. The composition and control of summer weeds were not affected by the cover crops.

All herbicide treatments provided acceptable control of sum[illegible] weeds. Seed cotton yield was [illegible] affected consistently by the ty[illegible] winter cover, but yield after e[illegible] cover crop was greatest follow[illegible] the most intensive applicatio[illegible] herbicides (Roundup, Treflan, [illegible] oran).

Table 2. Effect of winter cover crops and production operations on the composition and yield of winter vegetation on plots used to grow cotton with the production operations presented in Table 1, MAFES Delta Branch, 1978-1982.

		Winter Vegetation									
		Number of plants/15 square feet									
Cover		1978	1979	1980	1981		Total dry weight when harvested on				
Crop	Weed	April	April	April	April	Nov.	4/4/78	4/16/79	4/20/80	3/30/81	5/3/82
							(tons/acre)				
Wheat											
		54.9	76.5	75.5	236.0	173.0	0.55	1.42	0.54	1.10	0.91
	Annual bluegrass	9.5	4.5	12.5	7.5	55.7					
	Common chickweed	0.5	0	7.5	0	30.1					
	Cutleaf eveningprimrose	0	0	2.5	0	0					
	Hairy bittercress	47.5	51.0	86.5	4.4	81.6					
	Henbit	2.5	1.5	23.5	68.1	190.5					
	Mouseear chickweed	0	0	0	10.0	0					
	Mousetail	0	0	4.5	6.9	24.1					
	Water foxtail	0	0	0.5	0.4	0					
	Speedwell	5.5	19.0	58.0	15.0	19.0					
Vetch		20.5	68.5	70.5	30.4	112.1	0.57	1.31	0.70	0.66	1.18
	Annual bluegrass	31.5	12.0	18.5	12.5	60.0					
	Common chickweed	1.0	0	7.5	0	120.5					
	Cutleaf eveningprimrose	0	0.1	1.0	0	0					
	Hairy bittercress	149.0	122.5	94.0	7.5	75.7					
	Henbit	12.5	9.5	34.5	82.3	436.2					
	Mouseear chickweed	0	0	0	41.3	0					
	Mousetail	0	0	9.5	4.4	35.1					
	Water foxtail	0	0	0	1.5	2.5					
	Speedwell	6.0	31.5	69.5	12.5	46.5					
Winter Weeds Only		--	--	--	--	--	0.30	0.48	0.40	0.50	0.70
	Annual bluegrass	14.0	22.5	32.0	24.8	180.6					
	Common chickweed	0	0	11.5	0	83.0					
	Cutleaf eveningprimrose	0	1.5	1.5	0	0					
	Hairy bittercress	174.0	293.5	62.0	9.4	134.6					
	Henbit	8.5	4.0	33.5	63.5	387.1					
	Mouseear chickweed	0	0	0	17.3	0					
	Mousetail	0	0	9.5	7.9	88.2					
	Water foxtail	0	0	21.0	10.4	0					
	Speedwell	15.0	93.5	124.0	22.5	65.5					

Table 3. Effect of winter cover crops and production operations on stands of cotton, MAFES Delta Branch, 1978-1982.

Item	Cotton Stand 1978	1979	1980	1981	1982	5-Year Avg.
	(Plants/A in thousands)					
Main-Plot Treatments[1]						
A. Wheat	21.5 b	65.0 b	42.9 a	56.2 b	35.0 b	44.1 b
B. Vetch	31.0 a	54.8 c	38.9 a	41.9 c	25.3 c	38.4 c
C. Winter Weeds	32.3 a	80.6 a	44.2 a	64.5 a	43.9 a	53.1 a
Subplot Treatments[1]						
1. Bed only	26.2 a	65.5 a	43.8 a	52.5 a	32.7 c	44.1 a
2. Roundup PPF Bed Cotoran PRE	26.9 a	65.3 a	44.8 a	57.0 a	39.3 a	46.7 a
3. Roundup PPF Bed Treflan PPI Cotoran PRE	30.0 a	62.9 a	41.5 a	56.4 a	37.2 ab	45.6 a
4. Bed Cotoran PRE	26.9 a	70.6 a	41.0 a	51.5 a	33.8 bc	44.8 a
5. Bed Treflan PPI Cotoran PRE	31.2 a	69.6 a	39.0 a	53.6 a	30.7 c	44.8 a

[1]Means within columns followed by the same letter are not different (P=.05) according to DMRT. PPF = preplant to cover-crop foliage; PPI = preplant incorporated shallow; PRE= preemergence.

Table 4. Effect of winter cover crops and production practices on seed cotton yield, MAFES Delta Branch, 1978-1982.

Item	Seed Cotton Yield 1978	1979[2]	1980	1981	1982[2]	5-Year Avg.[2]
	(lbs/A)					
Main-Plot Treatments[1]						
A. Wheat	1088 c	2242	1443 a	1559 a	1431	1552
B. Vetch	1494 b	1796	1439 a	1565 a	889	1437
C. Winter Weeds	1905 a	1968	1469 a	1751 a	1458	1710
Subplot Treatments[1]						
1. Bed only	1006 c	1615	1301 c	1316 b	219	1091
2. Roundup PPF Bed Cotoran PRE	1542 ab	2060	1480 ab	1734 a	1350	1634
3. Roundup PPF Bed Treflan PPI Cotoran PRE	1789 a	2099	1579 a	1721 a	1657	1769
4. Bed Cotoran PRE	1487 b	2107	1356 bc	1689 a	1389	1606
5. Bed Treflan PPI Cotoran PRE	1654 ab	2131	1536 a	1665 a	1683	1734

[1]Means within columns followed by the same letter are not different (P=.05) according to DMRT. PPF = preplant to cover-crop foliage; PPI = preplant incorporated shallow; PRE = preemergence.
[2]A significant cover crop x herbicide treatment interaction; see Tables 8-10 for mean separation.

Table 5. Effect of winter cover crops and production operations on summer weed control as determined by hoe time required to remove weeds from plots, MAFES Delta Branch, 1978-1981.

Item	Hoe Time 1978	1979	1980	1981	4-Year Avg.
	(Hr/A)				
Main-Plot Treatments[1]					
A. Wheat	8.7 a	29.8 a	45.4 a	7.7 a	22.9 a
B. Vetch	13.0 a	44.5 a	48.0 a	6.5 a	28.0 a
C. Winter Weeds	10.6 a	28.7 a	41.5 a	5.2 a	21.5 a
Subplot Treatments[1]					
1. Bed only	21.9 a	75.9 a	66.3 a	17.6 a	45.4 a
2. Roundup PPF Bed Cotoran PRE	9.4 bc	29.3 b	49.3 a	3.8 b	22.7 b
3. Roundup PPF Bed Treflan PPI Cotoran PRE	5.7 c	32.2 b	27.4 b	2.8 b	17.0 b
4. Bed Cotoran PRE	11.4 b	11.3 b	58.7 ac	4.8 b	21.6 b
5. Bed Treflan PPI Cotoran PRE	5.8 c	23.8 b	23.1 b	3.3 b	14.0 b

[1]Means within columns followed by the same letter are not different (P=.05) according to DMRT. PPF = preplant to cover crop foliage; PPI = preplant incorporated shallow; PRE = preemergence.

Table 6. Effect of winter cover crops and production operations on summer weed control as determined by weed counts, by weed species, MAFES Delta Branch, 1978-1982.

	All Morningglory[1,3] 1978	1979	1980	1981	1982	4-Year Average	Redroot Pigweed[2,3] 1978	1979	1980	1981	1982	4-Year Average
	(No./6 sq. ft.)						(No./6 sq. ft.)					
Main-Plot Treatments												
A. Wheat	9.7[3]	--	1.8	0.5 b	2.0 a	2.8 b	16.3	2.5	--	0.2	0.4	4.9
B. Vetch	12.4	--	3.1	1.5 a	5.4 a	7.8 a	17.6	1.2	--	0.5	0.2	4.9
C. Winter Weeds	5.7	--	3.1	0.4 b	4.7 a	4.1 b	22.0	2.7	--	0.2	0.1	6.3
Subplot Treatments												
1. Bed only	13.4	--	4.1	2.2 a	14.5 a	8.6 a	45.2 a	14.2 a	--	1.0 a	1.0 a	15.4 a
2. Roundup PPF Bed Cotoran PRE	8.6	--	2.3	0.6 b	2.3 b	3.5 b	19.4 b	1.8 b	--	0.0 b	0.0 b	5.3 b
3. Roundup PPF Bed Treflan PPI Cotoran PRE	6.6	--	1.4	0.5 b	1.1 b	2.4 b	5.5 b	0.3 b	--	0.6 ab	0.0 b	1.6 b
4. Bed Cotoran PRE	13.8	--	2.1	0.3 b	1.4 b	4.4 b	20.0 b	2.2 b	--	0.0 b	0.0 b	5.6 b
5. Bed Treflan PPI Cotoran PRE	3.9	--	1.2	0.5 b	0.6 b	1.6 b	3.0 b	0.4 b	--	0.0 b	0.0 b	0.9 b

	Prickly Sida[3] 1978	1979	1980	1981	1982	5-Year Average	Annual Grasses[3] 1978	1979	1980	1981	1982[4]	5-Year Average
	(No./6 sq. ft.)						(No./6 sq. ft.)					
Main-Plot Treatments												
A. Wheat	11.7	3.1	0.4	5.7	1.1	4.4	11.2	66.0	2.4	11.7	26.1	23.5
B. Vetch	8.4	4.2	0.5	8.5	0.8	4.5	15.5	35.8	7.0	6.8	13.6	15.7
C. Winter Weeds	12.9	5.2	0.4	5.2	0.2	2.5	36.1	37.3	7.6	9.9	13.7	20.9
Subplot Treatments												
1. Bed only	19.7	9.3 a	0.9	22.8 a	3.4 a	11.2 a	44.9 a	143.8 a	21.2 a	45.9 a	73.4	65.8 a
2. Roundup PPF Bed Cotoran PRE	7.0	3.3 b	0.3	6.7 b	0.0 b	3.5 b	48.9 a	30.4 b	3.7 b	1.3 b	5.0	17.9 b
3. Roundup PPF Bed Treflan PPI Cotoran PRE	11.5	2.4 b	0.2	0.7 b	0.0 b	3.0 b	4.6 b	7.5 b	0.2 b	0.4 b	1.4	2.8 b
4. Bed Cotoran PRE	8.7	3.9 b	0.5	1.4 b	0.0 b	2.9 b	28.8 ab	47.5 b	2.8 b	0.8 b	7.3	17.4 b
5. Bed Treflan PPI Cotoran PRE	8.1	1.7 b	0.2	0.8 b	0.0 b	2.2 b	3.6 b	2.6 b	0.3 b	0.1 b	1.9	1.7 b

[1]No morningglory present in 1979.
[2]No redroot pigweed present in 1980.
[3]Means within columns for main-plot treatments and subplot treatments followed by the same letter are not different according to DMRT. PPF = preplant to cover-crop foliage; PPI = preplant incorporated shallow; PRE = preemergence.
[4]A significant cover crop x herbicide interaction; see Table 7 for mean separation.

Table 7. Effect of winter cover crops and herbicide treatments on annual grass control on plots used to grow cotton with the production operations presented in Table 1, MAFES Delta Branch, 1982.

	Herbicide Treatment				
Cover Crop	1. Bed only	2. Roundup Bed - Cotoran	3. Roundup Bed - Treflan - Cotoran	4. Bed - Cotoran	5. Bed - Treflan - Cotoran
	(No. plants/6 sq. ft.)				
A. Wheat	111.8 a A	5.0 a B	1.5 a B	7.3 a B	5.0 a B
B. Vetch	52.5 b A	7.0 a B	2.8 a B	5.5 a B	0.3 a B
C. Winter Weeds	56.0 b A	3.0 a B	0.0 a B	9.0 a B	0.5 a B

[1]Means within columns followed by the same lower case letter or within rows followed by the same capital letter are not different (P = 0.05) according to DMRT.

Table 8. Effect of winter cover crops and herbicide treatments on seed cotton yield from plots used to grow cotton with the production operations presented in Table 1, MAFES Delta Branch, 1979.

	Herbicide Treatment				
Cover Crop	1. Bed only	2. Roundup Bed - Cotoran	3. Roundup Bed - Treflan - Cotoran	4. Bed - Cotoran	5. Bed - Treflan - Cotoran
	(lbs/A)				
A. Wheat	1482 b B	2601 a A	2663 a A	2691 a A	2732 a A
B. Vetch	1785 abA	2001 b A	2234 a A	2042 b B	2156 b A
C. Winter Weeds	2087 a A	2217 abA	2099 a A	2275 abA	2258 abA

[1]Means within columns followed by the same lower case letter or within rows followed by the same capital letter are not different (P=0.05) according to DMRT.

Table 9. Effect of winter cover crops and herbicide treatments on seed cotton yield from plots used to grow cotton with the production operations presented in Table 1, MAFES Delta Branch, 1982.

	Herbicide Treatment				
Cover Crop	1. Bed only	2. Roundup Bed - Cotoran	3. Roundup Bed - Treflan - Cotoran	4. Bed - Cotoran	5. Bed - Treflan - Cotoran
	(lbs/A)				
A. Wheat	200 a B	1589 a A	1625 a A	1707 a A	2034 a A
B. Vetch	233 a C	866 b B	1482 a A	719 b B	1148 b AB
C. Winter Weeds	224 a B	1597 a A	1863 a A	1740 a A	1867 a A

[1]Means within columns followed by the same lower case letter or within rows followed by the same capital letter are not different (P=0.05) according to DMRT.

Table 10. Effect of winter cover crops and herbicide treatments on the yield of seed cotton from plots used to grow cotton with the production operations presented in Table 1, MAFES Delta Branch, 1978-82 Average.

Cover Crop	Herbicide Treatment 1. Bed only	2. Roundup Bed - Cotoran	3. Roundup Bed - Treflan - Cotoran	4. Bed - Cotoran	5. Bed - Treflan - Cotoran
	(lbs/A)				
A. Wheat	984 b B	1724 a A	1762 a A	1697 a A	1824 a A
B. Vetch	1089 b C	1474 b B	1822 a A	1446 b B	1600 b B
C. Winter Weeds	1295 a B	1873 a A	1862 a A	1838 a A	1928 a A

[1]Means within columns followed by the same lower case letter or within rows followed by the same capital letter are not different (P=0.05) according to DMRT.

Literature Cited

1. Alston, R. P., L. H. Harvey, M. C. McKenzie, and L. S. Livingston. 1976. Limited seedbed preparation for cotton in conventional and nonconventional row configurations (Abstr.). Proc. Beltwide Cotton Prod. Res. Conf. p. 113.
2. Dumas, W. T. 1981. Production of cotton in a winter cover crop residue. Proc. Beltwide Cotton Prod. Res. Conf. pp. 124-125.
3. Tupper, G. R. 1977. Evaluation of the Stoneville Parabolic Subsoiler. MAFES Bull. 858. 12 pp.
4. Tupper, G. R. and W. I. Spurgeon. 1981. Cotton respon subsoiling and chiselin sandy loam soil. MAFES 895. 8 pp.