

MINIMUM TILLAGE EXPERIMENTS AT TWO LOCATIONS, 1970

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Minimum tillage tests were continued at the Marana Farm and the Safford Experiment Station in 1970. Five treatments were replicated four times. The five treatments were: (1) Minimum tillage, rebed old beds; (2) Maximum tillage, disc, plow, disc, float and list; (3) Chisel-list deep (18"), rebed old beds; (4) Chisel list shallow (14"), rebed old beds, and (5) Chisel-list deep, moving laterally 20" to form new beds.

Penetrometer recordings, in two-inch increments to a depth of 24 inches were made, but these data are still being processed in the computer and are not available.

Yields, Table I, were not significantly different at either location. This is encouraging, since the power (and cost) inputs to tillage were significantly reduced by minimum tillage practices.

Plant counts were not significantly affected by tillage; however, operating the planters in the standing stubble in treatments number 1, 3 and 4 was quite difficult.

At the time of first flower, 25-plant samples were cut at random, oven-dried and weighed. At Marana there was a difference in plant weight in favor of chisel-listing, whether shallow or deep, and rebedding on the same beds. There were no differences at Safford. These data are shown in Table III.

Random samples were also pulled up for inspection of the root system and measuring of the tap root. Considerable "sprangling" of the root system had been previously noted at Safford. The foregoing term refers to the lack of any definable tap root. Lengths of the normal tap roots were measured, and notes were made on the percentage that was sprangled. These data are presented in Table IV. There were no differences by treatment.

Table I. First Picking Yields, Pounds of Seed Cotton per Acre, at Two Locations, Minimum Tillage Tests, 1970

Treatment	Location	
	Marana	Safford
1. Minimum tillage, rebed old beds	2,431 a	2,100 a
2. Maximum tillage, disc, plow, disc, float, list	2,483 a	2,190 a
3. Deep chisel-list, rebed old beds	2,483 a	2,415 a
4. Shallow chisel-list, rebed old beds	2,511 a	2,355 a
5. Deep chisel-list, move beds 20"	2,448 a	2,263 a

Table II. Plant Populations in 1970 Minimum Tillage Tests  
Thousands of Plants per Acre

Treatment	Location	
	Marana	Safford
1. Minimum tillage, rebed old beds	67.5 a	45.4 a
2. Maximum tillage, disc, plow, disc, float, list	52.4 a	35.2 a
3. Deep chisel-list, rebed old beds	58.7 a	42.9 a
4. Shallow chisel-list rebed old beds	54.0 a	41.2 a
5. Deep chisel-list, move beds 20"	60.2 a	47.6 a

Table III. Weight in Grams of 25 Cut Plant Samples after Oven Drying,  
1970 Tillage Tests

Treatment	Location	
	Marana	Safford
1. Minimum tillage, rebed old beds	270 ab	257 a
2. Maximum tillage, disc, plow, disc, float, list	236 b	233 a
3. Deep chisel-list, rebed old beds	326 a	231 a
4. Shallow chisel-list, rebed old beds	309 a	270 a
5. Deep chisel-list, move beds 20"	304 ab	245 a

Table IV. Tillage Tests, 1970. Mean Length of Tap Root and Percent Normal  
Root Systems

Treatment	Length, Inches		Percent Normal	
	Marana	Safford	Marana	Safford
1. Minimum tillage, rebed old beds	12.2 a	14.0 a	62.5 a	68.8 a
2. Maximum tillage, disc, plow, disc, float, list	12.0 a	14.5 a	62.5 a	81.2 a
3. Deep chisel-list, rebed old beds	15.0 a	16.4 a	75.0 a	95.8 a
4. Shallow chisel-list, rebed old beds	16.2 a	15.7 a	62.5 a	50.0 a
5. Deep chisel-list, move beds 20"	14.0 a	14.9 a	75.0 a	87.5 a