OBTAINING A STAND WITH NARROW-ROW COTTON

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In an effort to gain information on different cultural practices associated with obtaining a cotton stand under narrow-row culture, an experiment was conducted at the Agricultural Research Center, Phoenix. Deltapine 16 was planted March 24 and 25, 1970 by several methods using International 185 planting units. These practices included either preplant or postplant irrigation of 40- and 30-inch beds, formed with conventional listers, or planting flat. When planted flat, half of each plot was rototilled before planting and subplots for each treatment were split into deep and shallow planting depths.

The tops of the 30-inch beds were flattened with a drag after the preplant irrigation and before the postplant irrigation, as appropriate. The top of the beds was lillistoned to create a mulch after the preplant irrigation when it was used. Two rows were planted on each bed approximately 6 inches apart at both shallow and deep depths. The tops of the 40-inch beds were flattened either with a bed shaper with a rotary mulcher attached or with a rotary harrow after the preplant irrigation and before the postplant irrigation as appropriate. Two rows were planted on each bed approximately 12 inches apart at both shallow and deep depths. Stand counts were taken after emergence and are shown in Table 1. The experiment was not replicated but four subsamples were taken in each plot.

Following the planting of this experiment, suitable weather prevailed for establishment of excellent stands. There was little apparent difference between planting deep or shallow, although shallow planting tended to give better emergence when a preplant irrigation was used. Planting was accomplished as soon as possible after the preplant irrigation and the soil moisture was excellent. Had planting been delayed so that soil moisture was marginal, emergence from the deeper depth would likely have shown an advantage. However, emergence from this depth requires considerable energy and where soil temperatures are marginal, emergence can be greatly reduced.

Table 1. Stand counts (plants per 20 feet) for cotton planted March 24 and 25, 1970 at Phoenix with indicated planting depth. Average of four subsamples.

Treatment	Preplant irrigation			Postplant irrigation		
	1 1/2"	2 1/2"	2 1/2"	1"	1"*	1/2"
40-inch beds	62	58	54	63	54	--
30-inch beds	63	62	--	66	--	61
Flat	66	58	--	10	--	18
Flat, rototilled	60	56	--	16	--	15

*Bedshaper and mulcher used for planting.

Postplant irrigations can result in excellent stands, even with the heavy soils used in this experiment if water does not cover the seed rows. The effect of water covering the seed row is reflected in the poor stands that were obtained with flat planting and postplant irrigation. Similarly, poor stands were obtained when water ponded and went over the beds with a postplant irrigation.

Use of the bed shaper to flatten the top of the bed after the preplant irrigation had been applied gave irratic results. The bed shaper formed a shoulder from the dry soil at the top of the bed resulting in the seed often being placed in a poor moisture environment. In some places normal stands were obtained and in others no cotton emerged from extended areas of the row.

Flat planting following the preplant irrigation was accomplished as soon as the soil was dry enough to support machinery traffic. If the soil does not crack excessively while the seedlings are emerging, it appears that satisfactory stands can be obtained by planting without prior working or mulching of the soil. Mulching should have an advantage in reducing moisture loss and soil cracking. With heavy soils, postplant irrigation after planting flat appears to be unrealistic.

From the experience we gained from this experiment plus subsequent work, we believe the best method for obtaining a stand of cotton planted two rows per bed is to flatten the top of the beds prior to applying a preplant irrigation. Mulching prior to planting should conserve moisture and reduce cracking. Postplant irrigation of cotton planted two rows per bed will likely prove satisfactory under conditions where water can be controlled adequately so that it does not pond over the seed row. Irrigating after planting has two serious disadvantages: First, the irrigation water will cool the soil at a time when soil temperature may be critical for germination and emergence, and second, there may be practical limitations in the amount of land that can be irrigated in a reasonable amount of time following planting where large acreages of cotton are planted. Care should be exercised that the rows are not planted too close to the shoulders of the beds. This imposes a limit of not more than 6 to 7 inches between rows on 30-inch beds and not more than 12 to 14 inches between rows on 40-inch beds.