

Weekly Flower Count

Date	Week	Flowers per plot			
		DPL-61	DPL-16	DPL-66	ST-213
8/11/75	1	6.75	20.25	8.00	9.50
8/18/75	2	13.50	22.50	15.00	23.75
8/25/75	3	26.25	31.00	16.00	39.25
9/1/75	4	42.25	40.75	38.75	47.50
9/8/75	5	35.00	39.00	29.25	43.50
9/15/75	6	57.00	48.75	77.75	57.00
	Total	180.75	202.25	184.75	215.50

CROP HISTORY: Planting Date: 6/11/75. Planting Rate: 6" narrow row, 24 lb/A. Herbicide: 1-1/3 pts. Cobex on flat, and disk incorporated. Irrigation: 1st irrigation 6/12/75 + four other irrigations. Insecticide: Three applications of parathion. Harvest Date: 12/17/75 first pick, 1/6/76 second pick. Plot Size: Four-row plots, each row 1200' long, replicated four times.

ECONOMICS OF SHORT-SEASON AND NARROW-ROW COTTON PRODUCTION IN ARIZONA

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Cotton growers are faced with the problem of rapidly increasing prices of production inputs. To avoid reduced profits, the major alternatives open to cotton growers are to increase yield at the present input level and/or reduce those production inputs that have minimal effect on yield. An effective method of reducing production costs is to shorten the growing season, thereby reducing late season irrigation and insecticide expenses. Growing cotton in narrow rows can also reduce production costs while maintaining or increasing lint yield. Major cost reductions with narrow-row cotton include a more economical once-over harvest with a finger stripper machine and greater lint production early in the season reducing the need for late season production.

This study was conducted to examine narrow-row and short-season production systems as methods of reducing the cost of producing cotton. Agronomic data from the Cotton Research Center in Phoenix were used with current crop budgets to compare the profitability of the two production systems. The lint price used in this study was 48¢ per pound for spindle-picked cotton. Stripper-harvested lint was reduced one grade (3.5¢ per pound) to compensate for increased trash. Gin turnout was reduced from 33 to 30% for stripper-harvested cotton.

Partial budgets are used to simplify comparisons of changes in costs and returns due to early termination or to narrow-row production. A partial budget showing changes in net income resulting from early termination of conventionally grown cotton is shown in Table 1. Termination after nine weeks of flowering would reduce lint yield by 7%, reduce production costs by 20% and increase net farm income by \$48.00 per acre. If pump water cost is used instead of gravity water costs, net farm income is increased by \$72.00 per acre.

Table 1. Net Farm Income (\$/ac) Resulting from Terminating Conventionally Grown Cotton after 9 vs. 13 Weeks of Flowering

REDUCED COSTS:

Irrigation	13.53	
Insecticide	39.47	
Picking	38.74	
Hauling	1.07	
Ginning	5.04	
Prod. Credit	1.22	
Management	2.68	
Total		101.75

(continued)

Table 1 (continued)

REDUCED RETURNS:			
Yield		53.45	
Total Reduced Returns			<u>53.45</u>
NET CHANGE IN FARM INCOME			+48.30

Change in net farm income resulting from narrow-row vs. conventional cotton culture after eight weeks of flowering (to August 15) is shown in Table 2.

Table 2. Net Farm Income (\$/ac) from Narrow-row vs. Conventional Cotton Production after Eight Weeks of Flowering.

REDUCED COSTS:		ADDED COSTS:	
Cultivation	1.76	Shape beds	2.43
Buck rows	.27	Planting seed	4.80
Fertilizer	5.59	Hauling	1.10
Harvesting	34.46	Ginning	11.89
Road	<u>8.14</u>	Prod. credit	.70
		Management	<u>.54</u>
Total	50.22	Total	21.46
ADDED RETURNS:			
Yield	10.93		
Total added returns and reduced costs			<u>61.15</u>
NET CHANGE IN FARM INCOME:			+39.69

Using the narrow-row system and gravity water cost, a cost reduction of 7% is achieved. Lint yield is increased by 8%; however, gross return is increased by only 2% (\$11/acre) due to reduced lint grade. Net farm income is increased by \$40 per acre. Similar results were found using pump water costs.

Table 3 shows changes in net farm income resulting from narrow-row short-season (terminated after eight weeks of flowering) production compared to conventional full-season production (12 weeks of flowering). A net reduction in production costs of 26% (\$146/acre) is achieved. Although lint yields of the two systems are similar, returns of the stripper-harvested cotton are reduced by \$54 per acre due to increased trash. Net farm income is increased by \$79 per acre. About half of the reduced costs are due to the method of harvesting. Three items--harvesting, insecticides, and irrigation--accounted for 87% of the total reduction in production costs. Net farm income for the narrow-row crop using pump water is increased by \$102 per acre as compared to conventional full-season production.

Another method of comparing the effect of shortening the season on production costs is by calculating break-even prices. The break-even price is that price needed to cover all production and harvesting costs, including management and the required return on the capital invested. It is computed by dividing the total cost per acre by the yield.

A summary of break-even lint prices for conventional and narrow-row cotton is shown in Table 4. A break-even price of 10¢ more per pound of lint is needed to cover the costs of conventional full-season cotton production compared to narrow-row, short-season production. If the conventional crop is terminated four weeks early, the difference in the break-even price drops to 5¢ per pound.

Table 3. Net Farm Income (\$/ac) Resulting from Narrow-row after Eight Weeks of Flowering vs. Conventional Terminated after 12 Weeks.

REDUCED COSTS:		ADDED COSTS:	
Cultivation	1.76	Shape beds	2.43
Irrigation	14.74	Seed	4.80
Fertilizer	5.59	Herbicides	.10
Insecticide	39.47	Ginning	<u>5.79</u>
Harvesting	73.20		
Rood	8.14	Total	13.12
Hauling	.19		
Prod. credit	.53		
Management	<u>2.69</u>		
Total	145.81		
REDUCED RETURNS:			
Yield	53.79		
Total added costs and reduced returns			<u>66.89</u>
NET CHANGE IN FARM INCOME:			+78.92

Table 4. Break-even Prices (¢/lb) for Conventional and Narrow-row Cotton Production.

Cultural System	Water	Weeks of Flowering		
		8	10	12
Conventional	Gravity	27.56	31.26	32.43
	Pump	33.55	37.89	39.76
Narrow-row	Gravity	22.51	23.64	24.68
	Pump	28.04	29.88	31.57

Under conditions where plant growth can be controlled to achieve uniformly medium plant height allowing an efficient harvest with the stripper harvester, narrow-row cotton can be produced and harvested more economically than conventional full-season cotton. An opportunity exists to increase net farm income using the narrow-row, short-season system, especially in areas of high-cost pump water.

BREEDING COTTON ADAPTED FOR NARROW-ROW, HIGH POPULATION CULTURE AND LATE PLANTING

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Evaluation of selected genotypes of cotton grown under narrow-row, high population culture with late planting was carried on in 1975 at Yuma (100' elevation), and Cotton Research Center, Phoenix (1100').

Plant populations varied in the two tests, but in both locations the populations were considerably higher than that normally found in conventional single-row cultural practices.