Double Cropping and Plant Growth Regulators

DOUBLE CROPPING COTTON AFTER SMALL GRAIN IN GRAHAM COUNTY

D. L. Kittcok, B.B. Taylor. L. S. Daugherty, R. E. Cluff, M. L. Thatcher and P. Romney, University of Arizona

Summary

Several upland cotton varieties and one Pima cotton variety were planted and watered up after Poco barley and Yecora Rojo wheat on the Safford Experimental Farm in 1983. Three upland varieties were planted and watered up on July 2. McNair 235 produced the most lint for all three late planting dates. Pima cotton produced the lowest yields. Single cropped DPL 90 produced $8.47 more income/acre than McNair 235, following Poco barley. However, double cropped cotton and barley produced $57.96 more/acre than single cropped cotton, followed by single cropped wheat.

* * *

These tests were planted to cotton on the Safford Agricultural Center in 1983 as soon as possible after harvest of Poco barley and Yecora Rojo wheat. The third test followed wheat, but planting and watering up was delayed until July 2. Grain yields were 4099 lbs/acre for barley and 4020 lbs/acre for wheat.

Four upland cotton varieties and Pima S-6 were planted after barley harvest. Five upland varieties and Pima S-6 were planted after wheat. Three upland varieties were planted and watered up on July 2. There were three replications in each test. Plots were four rows by 220 feet. All tests receive a germination irrigation plus three additional irrigations. The cotton was allowed to mature until killed by a freeze on November 20.

The varieties planted, the date of the germination irrigation and lint yields are given in Table 1. McNair 235 produced more lint/acre than the other varieties in the three tests. Pima S-6 had much lower yield than upland cotton in the two tests with that comparison.

An economic evaluation of double cropping compared to conventional crop production is given in Table 2. Lint yields for DPL 90 and DPL 41 planted on 27 April are taken from other tests in adjacent fields. Operating costs and commodity prices are taken from the 1983 Graham County Crop Budgets. Double cropped cotton was presumed to have one less irrigation and one less harvest than conventionally produced cotton.

This comparison indicates the highest total net return for DPL 90 in conventional production. McNair 235 planted after Poco barley produced $8.47 less income per acre than conventional DPL 90. Returns for DPL 41 were lower than these two for both

Table 1. Lint yield* of late planted cotton at Safford Experimental Farm in 1983.

Variety	Cotton after Poco Barley Watered Up June 2	Cotton after Wheat Watered Up June 15	Watered Up July 2
	lbs/acre		
McNair 235	718 a **	589 a	286 a
DPL 30	---	507 b	259 a
Stoneville 825	652 c	488 c	240 a
DPL 70	677 b	465 d	---
DPL 41	626 d	459 d	---
Pima S-6	302 e	106 e	---
CV	5%	6%	6%

*Based on an estimated 32% gin turnout.

**Means within a column are not significantly different at the 0.5 confidence level if followed by the same letter according to Duncan's New Multiple Range Test.

conventional production and double cropping with Poco barley. Double cropping with wheat, because of later planting, gave lower income for all varieties. This evaluation also confirms that Pima cotton has no place in double cropping.

This economic evaluation should be considered illustrative in nature. Large year-to-year differences can be expected in cotton and grain yield. Double crop cotton yield will vary widely from year to year, depending upon fall temperatures and date of first freeze. Further, gin turnout, grade, and staple (which were not differentiated in these tests) will differ among varieties. Operating costs will vary from farm to farm and commodity prices are continually changing.

This evaluation suggests that conventionally cropped cotton is the best management choice. However, most growers perceive that rotating small grain with cotton increases lint yield of subsequent cotton crops. This has not been documented experimentally nor has the degree of benefit been measured. If the rotational value is real, double cropping in 1983 ($200.64/acre/year) produced more income than single crop cotton

Table 2. Economic evaluation of several cotton varieties in single crop and double crop production at Safford, Arizona in 1983.

GRAIN CROP	Poco barley	Yecora rojo wheat
COMMODITY PRICE / cwt.	5.50	6.15
YIELD (pounds)	4099.00	4020.00
GROSS RETURNS	225.45	247.23
OPERATING COSTS	168.63	170.99
RETURNS ABOVE OP COSTS	56.82	76.24

	SINGLE CROP		DOUBLE CROP (Barley plus Cotton)			
Cotton Variety	DPL 90	DPL 41	McNair235	DPL 70	DPL 41	Pima S-6
Plant Date	27 Apr	27 Apr	2 Jun	2 Jun	2 Jun	2 Jun
Yield(lb. lint)	824.00	725.00	718.00	677.00	626.00	302.00
Lint Price	.67	.67	.67	.67	.67	1.05
C'seed Yield	1359.60	1196.25	1184.70	1117.05	1032.90	498.30
C'seed Price	110.00	110.00	110.00	110.00	110.00	110.00
Gross Returns	626.86	551.54	546.2	515.03	476.23	344.51
Operating Costs	417.75	417.75	402.39	402.39	402.39	399.46
Returns above Operating Cost	209.11	133.79	143.83	112.64	73.84	-54.95
Total Returns	209.11	133.79	200.64	169.45	130.65	1.86

DOUBLE CROP (Wheat plus Cotton)

McNair235	DPL 70	DPL 41	Pima S-6
15 Jun	15 Jun	15 Jun	15 Jun
589.00	465.00	459.00	106.00
.67	.67	.67	1.05
971.85	767.25	757.35	174.90
110.00	110.00	110.00	110.00
448.08	353.75	349.18	120.92
402.39	402.39	402.39	399.46
45.69	-48.64	-53.21	-278.54
121.93	27.60	23.03	-202.30

followed by single crop wheat [($209.11 + $76.24)/2 = $142.68/acre/year]. Corresponding income values for the 1982 test, but using 1983 prices and expenses, were single crop DPL 90 at $371.91/acre, DPL 712 plus Poco barley was $355.59/acre, and single crop DPL 90 plus single crop wheat averaged $238.81/acre.