

# EFFECT OF COTTON PLANTING DATES ON FARM PROFITABILITY

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## Abstract

Timeliness of planting is one of the most critical operations related to cotton production. In Tennessee, cotton planted during the early period of recommended planting dates tends to out yield cotton planted in the latter part of the same period. To increase farm profitability, farmers should examine the feasibility of adding additional planting capability to increase acreage planted during this early window.

## Introduction

Satisfactory planting dates in Tennessee are April 20, to May 10. Weather conditions, soil type, the use of fungicides, etc. will help determine whether to plant early or late. Based on historical weather data there are approximately 5.1 days available for field work from April 15 to April 30 and 5.7 days available from May 1 to May 15. (Hudson) This time period (April 15 to May 15) corresponds closely to the recommended planting dates in Tennessee.

Research from the Milan Experiment Station (Chambers) from 1980-1988 shows that cotton planted in the first half (early) of the recommended planting window tended to out yield cotton planted in the second half (late) by 44 percent (see Table 1). Conversations with cotton specialists and county extension agents indicate that even with advances in today's cotton varieties there still exists a measurable difference in yields between early and late planted cotton. If a cotton producer could plant 10 hours a day for the days available in the early planting time, he could plant approximately 51 hours. An 8-row planter can plant about 10.24 acres/hour (Table 2). That would enable a producer to plant approximately 522 acres during the optimum (early) planting period of the recommended dates.

## Assumptions

For a producer to increase his acres in the optimum planting time several questions should be considered: 1) Is it feasible for a producer with more than 522 acres to purchase a second planter to plant during the optimum planting period? 2) If a second planter is purchased, is there enough tractor power available to pull the planter or will an additional tractor need to be purchased? 3) Can

current equipment keep up with the field work necessary to run two planters simultaneously? 4) Is labor available to run the second planter? 5) Can harvesting equipment handle the mature cotton crop without much economic loss?

To answer the above questions, the following assumptions will have to be made:

- 1) Planter 8-row 38-inch and 150 HP Tractor are purchased.
- 2) Current equipment can keep up with the demands of two planters.
- 3) No additional labor will be needed.
- 4) Timeliness of harvest will not be affected due to variety selection and harvest aids.

The first 522 acres is planted during the optimum planting period and any acreage over that is planted during the later part of the planting window. As acreage increases over 522 acres the average yield per acre decreases for one planter and remains constant for two planters. (Table 3).

The purchase price of an 8-row ,38-inch planter is approximately \$23,000 and that of a 150 HP tractor is \$70,000. The purchase price of those two pieces of equipment is \$93,000. Amortized over five years at 9 percent interest would result in a principal and interest payment of \$23,910 a year. This yearly payment would be the only additional cash cost a cotton producer would have, if an additional planter was added. All other costs are assumed to remain the same whether a planter is added or not.

In Table 4 the Gross Revenue Per Acre for one planter decreases as the number of acres increase over 522. This accounts for the lower yielding cotton planted in the later half of the recommended planting dates. Gross Revenue Per Acre for two planters remain constant as a result of additional planting capacity. The increased equipment cost per acre reflect the yearly payment of \$23,910 divided by the cotton acreage. Returns over additional equipment costs is calculated by subtracting increased equipment cost per acre from gross revenue per acre for two planters and then subtracting the gross revenue per acre for one planter. The breakeven point for adding an additional planter is 625 acres based on the Milan yield data. Acreage under 625 would be as well off with one planter while acreage over 625 would benefit from adding another planter.

## Limitations

Research on planting dates with current varieties is somewhat limited. Yield data with respect to planting dates from the Milan Experiment Station will vary from farmers' yields on their own farm. Table 5 demonstrates the acres needed to justify an additional planter based on various early and late yields assuming the same relationship as was exhibited in the Milan study. The higher the yield potential the less acres needed to justify adding an additional planter. To determine the feasibility of adding an additional planter, farmers will need to determine their own yield difference

with respect to planting dates on their own farm. Once yield differences are determined, cotton producers can calculate the feasibility of adding another planter.

### Summary

Yield data from the Milan Experiment Station indicates that cotton planted in the last half of April tends to out yield May planted cotton in Tennessee by 44 percent depending on planting conditions. Cotton producers with one planter can plant 522 acres in the later half of April. A producer with 625 acres or more would find it feasible to add an additional planter and tractor based on the Milan data.

Timeliness of planting is one of the most critical operations that affects the profitability of today's cotton producer. Producers planting in the early window of recommended planting dates have the opportunity to achieve a measurable yield increase over later planted cotton. Producers should explore the feasibility of adding additional resources to enable them to plant in the early time frame.

### References

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Table 1. Early vs Late Planting of Cotton Milan Experiment Station Milan, Tennessee 1980 - 1988

Year	Early Planting	Yield (Lbs)	Late Planting	Yield (Lbs)
1988	4/21	1045	5/6	666
1987	4/23	1860	5/7	1270
1986	4/30	1357	5/13	947
1985	4/29	1493	5/15	769
1984	4/27	1096	5/15	1063
1982	5/3	973	5/18	692
1981	4/28	685	5/13	337
1980	4/30	1032	5/14	908
Avg		1193		831

Table 2. Machinery Assumptions

Item	Size	New Cost	Life in Hours	Hours Per Year	Mach. Hr/AC	Acres Per Mach. Hour
Planter	8R 38"	23000	1500	100	.10	10.24
Tractor	150 HP	70000	12000	666	-	-

Table 3. Yield Per Acre For One and Two Planters

Acres	One Planter Yield (lbs.)	Two Planter Yield (lbs.)
522	1193	1193
600	1145	1193
625	1133	1193
650	1122	1193
700	1101	1193
750	1083	1193
800	1067	1193
850	1053	1193
900	1041	1193
950	1030	1193
1000	1020	1193
1050	1011	1193

Table 4. Returns Over Additional Equipment Cost at \$0.65 per pound of Cotton

Acres	Gross Revenue Per Acre(\$)		Increase Equip. Cost Per Acre(\$)	Returns Over Additional Equip. Cost(\$)
	One Planter	Two Planter		
522	775	---	---	---
600	745	775	40	-10
625	737	775	38	0
650	729	775	37	9
700	715	775	34	26
750	704	775	32	39
800	694	775	30	51
850	685	775	28	62
900	676	775	27	72
950	669	775	25	81
1000	663	775	24	88
1050	657	775	23	95

Table 5. Breakeven Acres to Justify Additional Planter Based on Early and Late Yield Assumptions

Early Yield(Lbs.)	Late Yield(Lbs.)	Breakeven Acres
400	278	824
500	347	763
600	417	720
700	486	694
800	555	672
900	625	656
1000	694	643
1100	764	631
1200	833	623
1300	903	615