

Double Cropping, Planting Rates, and Salt Drift

A Summary of 25 Years of Cotton Date of Planting Tests in Arizona

David L. Kittock, Agronomist; Roger Selley, Agricultural Economist;
B. Brooks Taylor, Agronomist

Summary

Thirty-five date of planting tests on upland or Pima cotton have been conducted in the major cotton growing counties in Arizona since 1960. A summary of these tests shows the highest average upland cotton lint yield came from planting 19 March in Yuma County, 1 April in Maricopa and Pinal Counties, 14 April in Pima County, and 21 April in Graham County. The best planting date for Pima cotton tended to be earlier than for upland cotton. On an average (optimum to latest), upland cotton lint yield was reduced an average of 13.9 pounds of lint/acre/day of delay in planting. For Pima cotton, the average reduction was 13.1 pounds of lint/acre/day.

* * * * *

By our count, there has been 35 date of planting tests by University of Arizona personnel on upland or Pima cotton in Yuma, Maricopa, Pinal, Pima, and Graham Counties of Arizona since 1960. These date of planting data are summarized by counties and by Pima or upland cotton for this report. The sources of the original data are listed in the references.

In most tests, there were 14 or more days between planting dates. The best planting dates for individual tests for upland and Pima cotton in the several counties are given in Table 1. The date of the highest mean lint yield is also given in Table 1.

The best planting date varied from test to test. By interpolating lint yields between planting dates, we were able to calculate the daily mean lint yields and the maximum mean yield planting date over all tests in a county. As expected, this highest average lint yield occurred at progressively later planting dates as elevation increased. Pima cotton tended to have an earlier maximum yield planting date than upland cotton. This is consistent with grower experience.

The variations in best planting date for individual years were expected and can be attributed to variations in weather among years. However, the two upland cotton tests in Maricopa and Pinal Counties having the highest lint yield from May plantings were unexpected. We have no explanation for these results. These May plantings produced about 100 pounds more lint/acre than early-April plantings.

Starting from the highest mean lint yields, we calculated the average daily yield change between planting dates for each test. Average daily yield changes were averaged across tests, and these daily changes were summed beginning at the highest mean lint yield to obtain daily expected yield reductions.

These expected yield reductions for planting dates are presented in 7-day increments for upland cotton in Table 2 and Pima cotton in Table 3.

Once the highest yield was obtained the reduction in lint yield varied considerably from test to test. Some of the variation is the result of high yield tests having a greater daily lint loss from delay of planting than low yield tests. On an average (maximum mean lint yield to latest lint yield), upland cotton yield was reduced 13.9 pounds of lint per acre per day of delay in planting once the highest yielding planting date was obtained. For Pima cotton, the reduction average 13.1 pounds of lint per acre per day of delay.

References

- Abbott, J. L. 1965. Effects of planting date, variety, and fertility level on upland cotton. Eighth Annual Report on Soil Fertility and Fertility Research, Univ. of Ariz., pp. 12-14.
- Armstrong, J. 1982. Rate and date of planting upland cotton. Univ. of Arizona Cotton Rept. P-56:135-136.
- Armstrong, J. 1983. Rate and date of planting upland cotton. Univ. of Arizona Cotton Rept. P-59:121-122.
- Armstrong, J. and B.B. Taylor. 1979. The effect of planting date and rate on development and yield of Pima cotton. Univ. of Arizona. Cotton Rpt. P-46:115-117.
- Armstrong, J. 1985. Rate and date of planting short staple cotton. Univ. of Arizona Cotton Rpt.
- Cannon, M. D. and H. F. Arle. 1977. Planting dates and methods. Univ. Ariz. Cotton Rpt. P-40:98.
- Cluff, R. E., B.B. Taylor, D. Kittock, and M. Thatcher. 1982. Planting date and seeding rate of upland and Pima cotton in Graham County. Univ. of Arizona Cotton Rpt. P-56:135.
- Farr, C. R. 1975. Date of planting trials. Univ. Ariz. Cotton Rpt. P-35:133.
- Farr, C. R. 1976. Comparison of short staple planting dates. Univ. Ariz. Cotton Rpt. P-37:65-66.
- Hazlitt, J. 1972. Single row variety trial. Univ. Ariz. Cotton Rpt. P-24:41.
- Hazlitt, J. and E. B. Jackson. 1973. Short staple date of planting trial. Univ. Ariz. Cotton Rpt. P-30:36.
- Jackson, E. B. and P. A. Tilt. 1967. Effects of date and method of planting on yields of cotton from two varieties. Univ. Ariz. Cotton Rpt. P-5:10-12.

Table 1. Cotton planting dates giving the highest lint yield in date of planting tests on upland and Pima cotton in several Arizona Counties since 1960.

<u>Year</u>	<u>Upland Cotton</u>				<u>Pima Cotton</u>		
	<u>Yuma</u>	<u>Maricopa- Pinal</u>	<u>Pima</u>	<u>Graham</u>	<u>Maricopa</u>	<u>Pima</u>	<u>Graham</u>
1961		4/1					
1962		5/15					
1965	3/30						
1966	3/19						
1967	3/19						
1968	4/3						
1969	3/6						
1971	4/3						
1972	3/15						
1973		4/2				4/6	
1974		4/4,3/16				4/3	
1975						4/14	
1976		4/2			4/2		
1977		4/4			3/21		
1979		5/7			4/9		
1980							
1981			4/15	4/21			
1982			4/14	4/21			4/21
1983				4/27			4/27
1984			5/1	5/9			4/23
Planting date with highest average lint yield							
	3/19	4/1	4/14	4/21	3/21	4/8	4/21

- Jackson, E. B. and P. A. Tilt. 1968. Effects of date and method of planting on yields of cotton from two varieties. Univ. Ariz. Cotton Rpt. P-9:11-14.
- Jackson, E. B. and P. A. Tilt. 1969. Effects of date of planting and date of termination on yield of cotton. Univ. Ariz. Cotton Rpt. P-15:19-20.
- Jackson, E. B. and P. A. Tilt. 1970. Effect of date of planting on yield of cotton. Univ. Ariz. Cotton Rpt. P-17:20.
- Kittock, D. L., T. J. Henneberry, and L. A. Bariola. 1981. Fruiting of upland a Pima cotton with different planting dates. Agron. J. 73:711-715.
- Kittock, D. L., B.B. Taylor, R. Cluff, and M. Thatcher. 1983. Cotton planting date and planting rate. Cotton, Univ. of Arizona Rpt. P-59:120-121.
- Kittock, D. L., B. B. Taylor, R. Cluff, and M. Thatcher. 1984. Cotton planting date and planting rate. Univ. of Arizona Cotton Rpt. P-61:109-110.
- Kittock, D. L., B. B. Taylor, R. Cluff, M. Thatcher, J. Malcuit, and C. Michaud. 1985. Double cropping cotton after small grain at Safford, Arizona. Univ. of Arizona Cotton Rpt.
- Kittock, D. L., B. B. Taylor, R. Cluff, M. Thatcher, J. Malcuit, and C. Michaud. 1985. Upland and Pima cotton planting rates and planting dates at Safford. Univ. of Arizona Cotton Rpt.
- Kittock, D.L., B.B. Taylor, L.S. Daugherty, R.E. Cluff, M.L. Thatcher, and P. Romney. 1984. Double cropping cotton after small grain in Graham County. Univ. of Arizona Cotton Rpt. P-61:11-13.
- Stedman, S., P. Kirkpatrick, and B. Taylor. 1981. Double crop cotton versus and early planting date. Univ. of Ariz. Cotton Rpt. P-53:120-122.
- Taylor, B. B., R. E. Cluff, D. L. Kittock, and M. L. Thatcher. 1982. Double cropping in Graham County. Univ. of Arizona Cotton Rpt. P-56:146-148.
- Taylor, B. B., D. L. Kittock, R. E. Cluff, and M. L. Thatcher. 1983. Double cropping in Graham County. Univ. of Arizona Cotton Rept. P-59:122-123 and 8.

Table 2. Average lint yield of upland cotton at planting date with highest average yield and yield loss by planting too early or too late in four counties in Arizona.

<u>Yuma County</u>		<u>Maricopa-Pinal Co's</u>		<u>Pima County</u>		<u>Graham County</u>	
<u>Planting Date</u>	<u>Lbs Lint/Acre</u>	<u>Planting Date</u>	<u>Lbs Lint/Acre</u>	<u>Planting Date</u>	<u>Lbs Lint/Acre</u>	<u>Planting Date</u>	<u>Lbs lint/acre</u>
3/5 (1)*	-67	3/18 (1)	-40	<u>4/14</u> (3)	<u>1201</u>	4/7 (3)	-103
3/12 (5)	-28	3/25 (3)	-27	4/21 (3)	-4	4/14 (4)	-52
3/19 (7)	<u>1,528</u>	4/1 (4)	<u>1,275</u>	4/28 (3)	-6	<u>4/21</u> (4)	<u>1099</u>
3/26 (7)	-10	4/8 (6)	-55	5/5 (1)	-173	4/28 (4)	-44
4/2 (7)	-25	4/15 (7)	-110	5/12 (1)	-341	5/5 (4)	-92
4/9 (7)	-113	4/22 (5)	-153	5/19 (1)	-401	5/12 (4)	-163
4/16 (7)	-214	4/29 (6)	-209	5/26 (1)	-419	5/19	-
4/23 (5)	-323	5/6 (6)	-243	6/2 (1)	-451	5/26 (2)	-326
4/30 (2)	-419	5/13 (5)	-269			6/2 (4)	-417
5/7 (1)	-508	5/20 (5)	-313			6/9 (3)	-527
5/14 (1)	-592	5/26 (4)	-360			6/16 (3)	-638
		6/3 (2)	-514				
		6/10 (2)	-727				

*Number of tests averaged for means.

Table 3. Average lint yield of Pima cotton at planting date with highest average yield and average yield loss by planting too early or too late in three counties in Arizona.

<u>Maricopa County</u>		<u>Pima County</u>		<u>Graham County</u>	
<u>Planting Date</u>	<u>Lbs Lint/Acre</u>	<u>Planting Date</u>	<u>Lbs Lint/Acre</u>	<u>Planting Date</u>	<u>Lbs Lint/Acre</u>
<u>3/21</u> (2)*	<u>1,221</u>	<u>4/8</u> (2)	<u>789</u>	4/7 (2)	-13
3/28 (2)	-50	4/15 (3)	-33	4/14 (3)	-8
4/4 (3)	-116	4/22 (3)	-63	<u>4/21</u> (3)	<u>699</u>
4/11 (3)	-116	4/29 (1)	-85	4/28 (3)	-23
4/18 (3)	-280			5/5 (3)	-60
4/25 (1)	-356			5/12	-
5/2 (1)	-460			5/19	-
5/9 (1)	-566			5/26 (4)	-276
5/16 (1)	-678			6/2 (4)	-388
				6/9 (3)	-501
				6/16 (3)	-592

*Number of tests averaged for means.