EFFECT OF PLANTING DATE AND DIFFERENT MANAGEMENT STRATEGIESON BOLL WEEVIL INFESTATIONS AND LINT PRODUCTION UNDER DRYLAND CONDITIONS IN OKLAHOMA 1997 AND 1998

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Abstract

Producing profitable dryland cotton has become increasingly difficult due to the resurgence of the boll weevil across Oklahoma. Several management strategies were employed in May and June-planted cotton to determine the impact on boll weevil infestations and lint production in 1997 and 1998. Boll weevil numbers varied greatly between years; high weevil numbers occurred in 1997 compared to low weevil emergence in 1998. ***May-planted cotton, regardless of the management strategy, out-produced June-planted cotton for both years***. In 1997, profits ranged between $36.78 to $193.31 / acre for the May 13th planting compared to $ 3.81 to $42.43 / acre for the June 6th planting . Overwintering sprays were of more importance in the May 13 planting ($151.98) than the June 6th planting ($3.61). Full season control provided the greatest return for both planting dates: May 13th -- $193.31 / acre and June 6th $42.43 / acre. In 1998, applying overwintering sprays to delay or prevent boll weevil damage did not enhance yields or monetary returns for both planting dates. Greatest return per acre resulted in the untreated plots for both planting dates emphasizing the need to base spray decisions on trapping indexes and field scouting throughout the growing season. To enhance profitability producers should strive to plant in May and scout fields regularly basing insecticide applications accordingly.

Introduction

Annually in Oklahoma, dryland cotton planting begins in May and extends into June. Many producers insist that June-planted cotton offers the best potential. Much of the potential offered by June-planted cotton depends on September rainfall and an open fall to accumulate sufficient heat units to mature the top crop set. Still others rely on delayed planting to reduce the overall boll weevil population by postponing the availability of squares until after the peak spring emergence. Boll weevils that emerge from overwintering habitat before squares are present die; this is termed suicidal emergence. Uniform delayed planting can be highly effective if followed by the entire farming community.

However the resurgence of the boll weevil limits the potential of late planted cotton in areas intermixed with early-planted cotton. Early-planted cotton insures a food source for weevils emerging in June. If overwintering insecticide sprays are not applied between pinhead square stage and first bloom, these early-planted fields become weevil nurseries. June-planted cotton is overwhelmed in late August and early September by boll weevils migrating out of early-planted fields nearing cutout. This study was initiated to determine impact of various management strategies on dryland cotton production to maximize profitability by varying planting date.

Budgets and cost analysis were prepared by A. L. Hutson, Extension Economist, to help interpret the effects of different management strategies on profitability. Three different management strategies were employed to prevent boll weevil damage in 1997 and 1998:

1 - Overwintering sprays only
2 insecticide applications applied between pinhead square and first bloom – 7 day intervals

2 - In - season control only
3 insecticide applications applied after bloom once the treatment threshold of 15 -25% infested squares was reached – 7 day intervals

3 - Full Season
overwintering sprays + inseason control

Strategy 1 was applied automatically once plants initiated squaring. Strategies 2 and 3 were triggered once boll weevils exceeded economic thresholds during the boll set period. All insecticide applications were applied by ground rig - with 7.7 gallons finish spray per acre.

Summary of 1997 Results

Applying insecticides to delay or prevent boll weevil damage enhanced returns for all treatments for both planting dates. ***May-planted cotton, regardless of the management strategy, out-produced June-planted cotton***. Profits ranged between $36.78 to $193.31 / acre for the May 13th planting compared to $ 3.81 to $42.43 / acre for the June 6th planting. ***The June 6th untreated plot lost $52.26 / acre***. Overwintering sprays were of more importance in the May 13 planting ($151.98) than the June 6th planting ($3.61). Planting early and only providing in-season control lost $41.90 /acre compared to applying overwintering sprays only. Planting late and only providing in-season control gained $14.80 / acre over applying overwintering sprays only. Full season control provided the greatest return for both planting dates: May 13th -- $193.31 / acre and June 6th $42.43 / acre.

Summary of 1998 Results

Two of the three control strategies were not employed due to the lack of damaging infestations of boll weevils. Only

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the overwintering spray strategy was applied to both planting dates and compared to the untreated plots:

Applying overwintering sprays to delay or prevent boll weevil damage did not enhance yields or monetary returns for both planting dates. ***May-planted cotton out-produced June-planted cotton regardless of the management strategy.*** Greater return per acre resulted in the untreated plots for both planting dates emphasizing the need to base sprays on trapping indexes in the spring and field scouting throughout the growing season.

Conditions experienced during the growing season will influence insect buildups and lint production. Yield and monetary results emphasize the importance of planting date and scouting to produce profitable dryland cotton. Last year I wrote "***Until boll weevils are eradicated or a severe winter occurs, producers should strive to plant dryland cotton before May 25 and base insect control decisions on weekly scouting***. After this date, producers should consider planting alternative crops, i.e., peanuts or sorghum instead of cotton." This should be amended by saying – ***producers should strive to plant dryland cotton in May to maximize profitablity – period!!***

1997 Dryland Operating Expenditures:		
Seed	12lbs @ 70¢	$8.40
Herbicide		6.40
Hoeing		12.00
Scouting		5.00
Nitrogen	40lbs @ 21¢	8.40
Phosphorus	30lbs @ 18¢	5.40
Ginning		15.00
Crop Insurance		16.00
Custom Harvest		45.00
Labor	2.25hrs @ $6.50	14.63
Fuel, Lube & Repair		22.00
Operating Interest	$97.83 @ 10%	4.89
Total Operating Costs		**$162.72**
Insecticide Expenditures:		
Application		$3.00
Insecticide		2.50
Application Cost		5.50
Overwintering Sprays	**(2)**	**$18.00[2]**
In-Season Sprays	**(4)**	**$29.00[2]**
Full Season	**(6)**	**$40.00[2]**

[2] All treatments (including untreated) received an aphicide spray = $7.00.

Effect of Planting Date and Various Boll Weevil Management Strategies on Insect Infestations and Lint Production, Tipton, Oklahoma, 1997.

Planting date	Variety	Seasonal Means		Lint (lbs/acre)	Difference between planting dates
		Flea-hoppers /100 plants	Boll weevil infested squares /100 squares		
Untreated					
May 13	Paymaster HS-26	20.00	14.53	289.24	
	Holland 1379	18.33	14.76	236.40	
		19.17	**14.65**	**262.82**	
June 6	Paymaster HS - 26	5.00	34.33	111.19	
	Holland 1379	8.33	32.43	79.14	
		6.67	**33.38**	**95.17**	**167.65**
Overwinter					
May 13	Paymaster HS - 26	16.67	18.95	503.53	
	Holland 1379	11.67	12.90	503.45	
		14.17	**15.93**	**503.49**	
June 6	Paymaster HS - 26	5.00	32.38	171.15	
	Holland 1379	10.00	29.52	230.67	
		7.50	**30.95**	**200.91**	**302.58**
In-season					
May 13	Paymaster HS - 26	18.33	10.66	446.58	
	Holland 1379	8.33	12.19	446.87	
		13.33	**11.43**	**446.73**	
Full season					
May 13	Paymaster HS - 26	16.67	13.00	625.30	
	Holland 1379	16.67	16.95	627.72	
		16.67	**14.98**	**626.51**	
June 6	Paymaster HS - 26	6.67	32.91	316.28	
	Holland 1379	11.67	31.90	367.06	
		9.17	**32.41**	**341.67**	**284.84**

Value of Planting Date to Dryland Cotton Production Tipton Research Station, 1997

Treatment	Planting Date		Planting Date Difference Within Treatment
	May13	June 6	
Untreated			
Untreated Returns	$171.08	$61.88	
Operating Cost	134.30	114.14	
Return to Land, Overhead, Risk & Management	$36.78	($52.26)	**$89.04**
Overwintering[1]			
Return	$327.08	$130.65	
Operating Cost	175.10	126.84	
Return to Land, Overhead, Risk & Management	$151.98	$3.81	**$148.17**
In Season[2]			
Return	$290.42	$178.23	
Operating Cost	180.34	159.62	
Return to Land, Overhead, Risk & Management	$110.08	$18.61	**$91.47**
Full Season[3]			
Return	$407.22	$222.17	
Operating Cost	213.91	179.74	
Return to Land, Overhead, Risk & Management	$193.31	$42.43	**$150.88**

[1]Overwintering - consist of two boll weevil application timed at 7 day intervals at pinhead square stage.
[2]In season - consist of four boll weevil applications after bloom.
[3]Full season - consist of boll weevil application (overwintering plus in-season).

Monetary Returns Related to Planting Date and Boll Weevil Management Strategies.

Treatment	Planting Date: May 13 Return to Land, Overhead, Risk & Management	May 13 Change in Return from Spraying	June 6 Return to Land, Overhead, Risk & Management	June 6 Change in Return from Spraying
Untreated	$ 36.78		($52.26)	
Overwintering[1]	$151.98	+115.20	$3.81	+56.07
In season[2]	$110.08	+73.30	$18.61	+70.87
Full Season[3]	$193.31	+156.53	$42.43	+94.69

[1]Overwintering - consist of two boll weevil application timed at 7 day intervals at pinhead square stage.
[2]In season - consist of four boll weevil applications after bloom.
[3]Full season - consist of boll weevil application (overwintering plus in-season).

1998 Dryland Operating Expenditures:		
Seed	12lbs @ 70¢	$8.40
Herbicide		6.40
Hoeing		12.00
Scouting		5.00
Nitrogen	40lbs @ 20¢	8.00
Phosphorus	30lbs @ 18¢	5.40
Ginning		15.00
Crop Insurance		16.00
Custom Harvest		45.00
Boll Weevil Eradication		12.50
Labor	2.25hrs @ $6.50	14.63
Fuel, Lube & Repair		22.00
Operating Interest	$97.83 @ 10%	4.87
Total Operating Costs		**$174.80**
Insecticide Expenditures:		
Application		$3.00
Insecticide		2.50
Application Cost		5.50
Overwintering Sprays (2)		**$11.00**

Effect of Planting Date and Various Boll Weevil Management Strategies on Insect Infestations and Lint Production, Tipton, Oklahoma, 1998.

Planting date	**Variety**	**Seasonal Means** Flea-hoppers /100 plants	Boll weevil infested squares /100 squares	**Lint (lbs/acre)**	**Difference between planting dates**
Untreated					
May 20	Paymaster HS - 26	0.00 b[1]	0.83a	655.83a	
	Paymaster 183	0.03 b	0.82a	709.37a	
		0.02	**0.83**	**682.60**	
June 10	Paymaster HS - 26	0.00 b	0.00a	318.35 b	
	Paymaster 183	0.43ab	0.82a	278.80 b	
		0.22	**0.41**	**298.58**	**384.02**
Overwinter					
May 20	Paymaster HS - 26	0.70a	0.00a	663.62a	
	Paymaster 183	1.00a	0.00a	665.79a	
		0.85	**0.00**	**664.71**	
June 10	Paymaster HS - 26	0.03 b	0.85a	315.18 b	
	Paymaster 183	0.03 b	0.00a	298.17 b	
		0.03	**0.43**	**306.93**	**357.78**

[1] Means followed by same letter do not significantly differ(P=.05,LSD).

Value of Planting Date to Dryland Cotton Production Tipton Research Station, 1998.

Treatment	**Planting Date**		**Planting Date Difference Within Treatment**
	May20	**June 10**	
Untreated			
Untreated Returns	$409.56	$179.15	
Operating Cost	198.54	148.62	
Return to Land, Overhead, Risk & Management	$211.02	$30.53	**$180.49**
Overwintering[1]			
Return	$398.83	$184.16	
Operating Cost	207.22	160.70	
Return to Land, Overhead, Risk & Management	$191.61	$23.46	**$168.15**

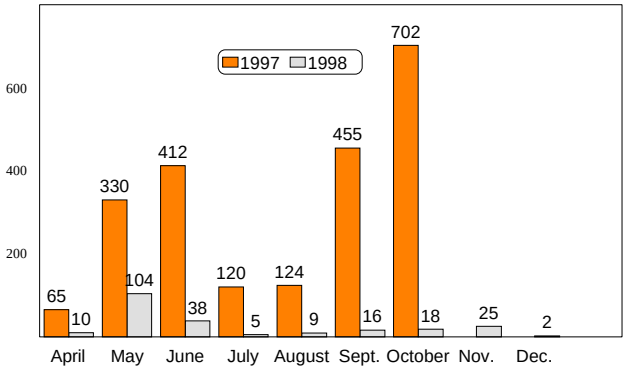
[1] Average of two varieties, Paymaster HS-26 and Paymaster 183.

[2] Overwintering - consist of two boll weevil application timed at 7 day intervals at pinhead square stage.

Monetary Returns Related to Planting Date and Boll Weevil Management Strategies, Tipton Research Station, 1998.

	Planting Date			
	May 20		June 10	
Treatment	Return to Land, Overhead, Risk & Management	Change in Return from Spraying	Return to Land, Overhead, Risk & Management	Change in Return from Spraying
Untreated	211.02		20.53	
Over-wintering[1]	191.61	($19.41)	23.46	($2.93)

[1]Overwintering - consist of two boll weevil application timed at 7 day intervals at pinhead square stage.



Number of Tillman County traps - 9

Figure 1. Average number of boll weevil caught in Tillman County, 1997 and 1998.