Profitability of 2 and 2 Skip Row Planting

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Abstract

As water resources become more scarce throughout the Southern High Plains, farmers will need to find alternative management methods to achieve profitability. Budgets from the TAWC were used to compare the profitability of producers using 2 and 2 skip row planting to conventional solid planting patterns and found that in areas experiencing drought conditions with declining saturated thickness, a 2 and 2 planting method out-performs a conventional planting method in dollar per acre and dollar per acre inch of water applied.

Introduction

Since 2005, the Texas Alliance for Water Conservation (TAWC) has worked directly with producers in over nine counties in the Southern High Plains to demonstrate technologies and management practices to support water conservation efforts. There are over 30 demonstration sites that cover over 5,000 acres representing monoculture, multi-crop, and integrated crop-livestock systems. Irrigation systems represented on the sites include furrow, Low Energy Precision Application (LEPA), Low Elevation Spray Application (LESA), Mid-Elevation Spray Application (MESA), Subsurface Drip Irrigation (SDI), and dryland.

The objective of this project is to determine if 2 and 2 skip row cotton under minimum irrigation capacity can obtain equal profitability per acre and per acre inch of water applied compared to continuous row planting.

Research Methods

Budget data from the TAWC was used to compare two producer sites with 2and 2 skip row cotton and two producer sites with continuous row planting for 2013 and 2014. Sites 14 and 19 were planted with a 2 and 2 system, and sites 3 and 6 were planted using conventional methods.

Table 1 provides the irrigation system, pumping capacity and the number of wells on each site. Sites 14 and 19 were planted as cotton monoculture crops for 2013 and 2014. Site 3 has 2 fields with 61.50 acres of cotton and 61.80 acres of grain sorghum for 2013 and 2014. In 2013, Site 6 was planted in 60.60 acres of cotton and 62.10 acres of irrigated wheat and in 2014, the grain sorghum was replaced with corn. The Sites used a variety of pivot irrigation systems including LESA, LEPA, and MESA.

Producers saw an average rainfall of 5.3 inches during the record breaking drought of 2011, which was followed by 9.9 inches of rainfall in 2012 and 13.2 inches in 2013. Above average rainfall was experienced in 2014; however, poor timing of rainfall events and low effective rainfall contributed to poor crop yields. Sites 3 and 6 have greater pumping capacity than Sites 14 and 19, and were able to pump significantly more water to supplement rainfall, with Site 3 applying 17 acre inches of irrigation and Site 6 applying an average of 19 over the course of the two years (Table 1).

Table 1. Site Information

Site	Total Site Acres	Crop Mix	Irrigation System	Pumping Capacity (gal/min)	Number of Wells	Irrigation Applied 2013	Irrigation Applied 2014
14	124.1	Cotton	LESA	300	3	7.50	9.05
19	120.3	Cotton	LEPA	400	3	12.00	8.50
3	123.3	Cotton/ Grain Sorghum	MESA	450	2	17.10	17.00
6	122.7	Cotton/ Grain Sorghum/ Corn	LESA	500	4	22.60	15.85

Results

Tables 2 and 3 compare budgets for two sites in the 2 and 2 skip row planting versus two sites in solid planting for 2013 and 2014. The budgets only include cotton observations. All sites were assumed to have identical fixed costs, which consisted of the maintenance cost for center pivot irrigation systems.

Results for profitability in dollar per acre are shown in Table 2. In 2013, the 2 and 2 production systems had lower gross income than compared to the conventional plant systems. However, due to the decreased amount of irrigation water applied in the 2 and 2 systems, the variable cost of production was lower, resulting in higher net returns than compared to the conventional sites. In 2014, Sites 14 and 6 have similar gross incomes. Again, Site 14 achieved higher net revenue than compared to Site 6, the conventional plant. Site 19 performed poorly with much lower revenues than compared to the other sites. Site 3 had the highest gross income and the highest amount of net returns, but also had the highest amount of variable costs compared to the other sites.

Table 3 compares the profitability of each site in terms of dollars per acre inch of water applied. In 2013, Site 14 had the highest gross income and net returns per acre inch of water applied compared to all other sites. Site 19 achieved higher water productivity than Site 6, even though site 19 had lower gross income. In 2014, revenues in terms of dollars per acre inch shows the 2 and 2 sites achieved higher revenues per acre inch of water applied than the conventional systems. Sites 14 and 3 had comparable net returns.

Table 2. Budget Values ($/ac)

	2013				2014			
	2 and 2		Conv.		2 and 2		Conv.	
	Site 14	Site 19	Site 3	Site 6	Site 14	Site 19	Site 3	Site 6
Gross Income	$1,462	$1,220	$1,840	$1,640	$1,022	$886	$1,462	$1,055
Variable Cost description:								
Total Pre-harvest	$259	$407	$565	$654	$416	$411	$539	$436
Total Harvest	$313	$260	$414	$340	$250	$235	$411	$274
Interest Costs	$8	$12	$17	$20	$12	$12	$16	$13
Total Variable Cost	$579	$679	$996	$1,014	$678	$659	$966	$723
Gross Margin	$883	$540	$844	$627	$343	$228	$496	$332
Fixed Cost	$140	$140	$140	$140	$140	$140	$140	$140
Total Cost	$719	$819	$1,136	$1,154	$818	$799	$1,106	$863
Projected Net Returns	$743	$400	$704	$487	$203	$88	$356	$192

Table 3. Budget Values ($/ac in of water applied)

	2013				2014			
	2 and 2		Conv.		2 and 2		Conv.	
	Site 14	Site 19	Site 3	Site 6	Site 14	Site 19	Site 3	Site 6
Gross Income	$195	$51	$108	$73	$113	$104	$86	$95
Variable Cost description:								
Total Pre-harvest	$34	$34	$33	$29	$46	$48	$32	$39
Total Harvest	$42	$22	$24	$15	$28	$28	$24	$25
Interest Costs	$1	$1	$1	$1	$$1	$1	$1	$1
Total Variable Cost	$77	$57	$58	$45	$75	$77	$57	$65
Gross Margin	$118	$45	$49	$28	$38	$27	$29	$30
Fixed Cost	$19	$12	$8	$6	$15	$16	$8	$13
Total Cost	$96	$68	$66	$51	$90	$94	$65	$77
Projected Net Returns	$99	$33	$41	$22	$22	$10	$21	$17

Conclusions

In times of drought, sites that lack water resources have higher net returns in dollar per acre and in dollar per acre inch of water applied when using 2 and 2 systems. The 2 and 2 planting system performs better than sites who supplement more water under conventional planting methods. In years that received more rainfall (2014), the 2 and 2 systems had the same net returns as the conventional plant in terms of dollars per acre inch of water applied. In dollar per acre, conventional had more profitability. In areas where the saturated thickness of the Ogallala has declined, the 2 and 2 planting system allows farmers to be just as productive with their water as a conventional planter.