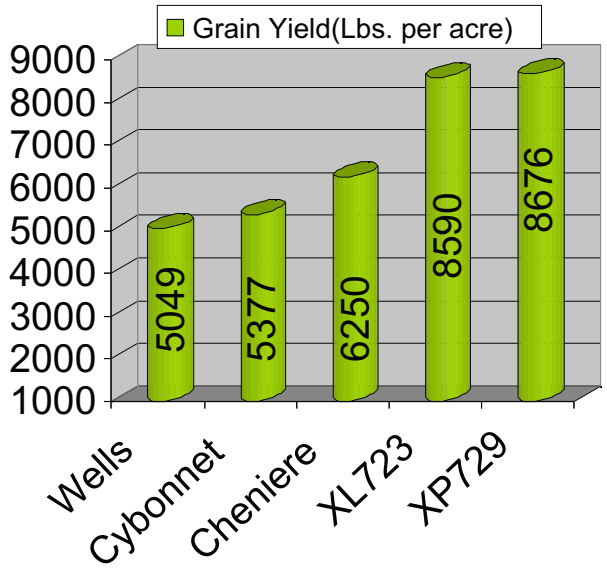
in Arkansas county, Arkansas from 2005-2006. Hybrids have a 3,075 lb raw yield advantage over the conventional varieties on bedded trials.



Water Conservation From Reduced Tillage And Land Forming

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The objective of this project was to evaluate the in-field conservation from practices adopted since the last studies. The potential conservation of irrigation inflow of zero grade land forming and fall-stale seedbed tillage systems was evaluated. Conventional contour-levee fields and continuous grade fields were monitored for baseline comparison. The average field use in the Lakeside and Garwood Districts is included in the report for general reference.

MATERIALS AND METHODS

The only known fields that have been converted to zero grade land forming are in the Lakeside District. Measurements comparing this practice to unimproved fields will focus in that area. Reduced tillage is a more widely adopted practice. The impact of fall-stale seedbed on in-field irrigation water use was evaluated in the Garwood and Gulf Coast Districts. Monitoring sites and comparisons are shown in Table 1.

Irrigation Field Monitoring

The irrigation field monitoring study will characterize all inputs and losses from selected rice fields. Additional information will be collected to correlate with the water use information. The study was designed to monitor a field with minimal interference with the producer's general management. The parameters monitored and monitoring methodology is described below.

$$I + R = RO + FU$$

where

I = irrigation inflow
R = rainfall
RO = runoff
FU = field use

Three components of the equation below are measured. Field use is be determined by sub-

Table 1. Proposed Field Monitoring for additional water use data		
	Field	Fields objectives – Lakeside District
	L1	One zero graded field – 6-35 ac cuts
	L2	One zero graded field – 1-70 ac cut
	L3	One precision graded field
	L4	One precision graded field with benches
	L5	One unimproved field
	L6	One unimproved field
		Field objectives – Garwood District
	G1	One Reduced Tillage field - fall stale seedbed
	G2	One conventional tillage field - same producer

tracting runoff from the total inflow.

Irrigation Inflow: Irrigation inflow was determined for each field. For fields in the Lakeside District, the LCRA inflow will be obtained weekly and used. For fields in the Garwood District, inflow was measured at the turn-in for each field. Irrigation inflow was measured as water entered the field using a propeller type flow meter. LCRA measures inflow daily on the fields in the Lakeside District. In the Garwood District, inflow equipment was checked daily during flushes and at least twice weekly between flood establishment and drain when possible.

Rainfall: Rainfall was monitored near each field. The gauge was installed as near as possible to the inflow point. A battery powered Torrent accumulating tipping bucket rain gauge was installed at each location.

Runoff: Water depth was recorded near the drain point in each field. Runoff was measured using rectangular sharp crested metal weirs located at drain points in conjunction with water depth. One and two foot weirs were refurbished or constructed. The field size and geometry determined the number of weirs needed in each field. The weirs have adjustable crests to permit flexibility in flood depth. The water-stage recorders were connected to Hobo H8 data loggers. Water depth was logged every two hours. Data logger internal clocks were synchronized every week when the data was down loaded with a Hobo logger shuttle. Using the continuous record of water depth, weir measurements, and theoretical formulas runoff was computed for each two hour interval and accumulated using a spreadsheet model.

RESULTS

The surveys determined that the zero-grade fields did not have zero slope. This was not surprising based on the natural movement of the vertisols of the area and the normal settling following a landforming operation. Each zero-grade field had a slight slope from the irrigation inlet to the drain. Surveys indicated a slope of about 0.05 foot per hundred feet. While most precision graded fields have a slope of 0.10 to 0.15 foot per 100 feet.

Field Description:

Field L1 Zero Grade – This was a 189 acre field that was divided to form six cuts that were nearly zero grade and approximately equal size. The levees dividing the cuts and the outside levees were permanent roads at least 24 inches above field level. This field is located was diagonally across a county road from the #1 graded field. Each cut was watered and drained from a central lateral. The depth and inflow was controlled with a drop-pipe header in the lateral. The inlet and drain for each cut was the same drop pipe installation. Season runoff was estimated for all cuts by using the header as a rectangular weir with a modified top board. The end of crop drain water was estimated from water depth recorders in each cut.

Field L2 Zero Grade – This was a 64.6 acre field land formed to nearly zero grade all in one cut. The external levee was only slightly higher than standard levees. The field had one inlet and three drain points through pipes to the road ditches. Two of the pipes were blocked with plywood and earthen banks during the flood period. The third drain was equipped with a rectangular sharp crested weir and water depth recorder. The season runoff was estimated through this weir. The end of crop drain water was estimated from flood depth as determined by four water depth recorders located in each quadrant of the field.

Field L3 Precision Graded – This was a 130 acre field that had been land-formed with a continuous grade from the inlet to the drains. The levees were constructed this year and were standard height and width. The out side levee was a permanent road but not exceptionally high.

There was one inlet and two drain points. The drains were equipped with drop-pipe headers which were used as rectangularweirs with a modified top board.

Field L4 Precision Graded – This was a 127.5 acre field that has been land formed with benches and a continuous grade in the benched cuts. The field had one inlet and one drain point. The drain was equipped with drop-pipe headers which were used as rectangular weirs with a modified top board. The levees between cuts were permanent roads and probably were 18 to 20 inches high. The outside levees were permanent and the bottom levee was at least 36 inches high. There was no second crop from this field.

Field L5 Unimproved – This was a 125 acre field that was located across a field road from the #1 zero grade field. This field has one inlet and one drain. The drain point was equipped with a drop-pipe header and water depth recorder to estimate runoff.

Field L6 Unimproved – This was a 49.6 acre field with one inlet and one drain. The outside levees on three sides were permanent roads and there was a seasoned levee on the third side. The field was flatter near the top but dropped of sharply near the bottom to a creek. There was no second crop on this field.

Field G1 Fall-Stale Seedbed Tillage – This was a 70 acre field with one inlet and one drain. Inflow was measured using an open propeller flow meter. The drain was equipped with drop-pipe headers which were used as rectangular weirs with a modified top board. The top levees along one side were permanent roads. The remaining levees were tall but constructed during the current season. The bottom levee was breached during one rain in May and the flood from the small bottom cut was lost. The water loss was estimated from the cut size and water depth prior to the wash out.

Field G2 Conventional Tillage – This was a 90 acre field with one inlet and two drain points. The drains were equipped with drop-pipe headers which were used as rectangular weirs with a modified top board. Inflow was measured using an open propeller flow meter. The exterior levees were well seasoned levees. The bottom levee was at least 24 inches tall.

WATER BALANCE SUMMARIES:

Water use summaries are presented in Table 2 for the main crop and Table 3 for the ratoon crop. Data organization follows the order outlined in the equation in the Materials and Methods section. District averages are included for reference as the producers decided not to ratoon crop Fields L4 and L6.

COMMENTS

- The precision graded fields resulted in slightly greater water savings in the main crop. The pattern continued over to the ratoon crop, but one must consider there was only one precision graded field with a ratoon crop.
- The savings for the Field L1 precision graded was probably due to the hands on management of the producer.
- The water savings for the Field L4 graded and Field L1 was most likely influenced by the design with the permanent-high cross and external levees.
- Field L1 zero graded had no runoff until the floods were drained for harvest.
- The conservation for the stale seedbed field was mainly due the reduced number of flushes.
- It was difficult with one year's results and the limited number of observations for the second crop but it would appear the continuously graded fields require less irrigation water than the zero graded fields.
- Field L5 had abnormally low irrigation inflow and runoff for an unimproved field. The inflow and drain points for this field were evaluated several times during the year. There were noobvious points of error. This field appeared to be a difficult to irrigate unimproved field. However, the irrigation inflow was will below district averages. It is recommended that caution be exercised when using data from this field for general comparisons.
- These drastic differences may not be expected to occur each year. The treatment rankings would probably remain the same.

Notes:_____

Table 2. Main Crop Rice Water Budgets by Management Practices for 2005.

Field	Field Description	Inflow (ac-in/ac)	Rain (in)	Total (in)	Runoff (ac-in/ac)	Field Use (ac-in/ac)
L1	Zero	16.34	19.00	35.34	15.81	19.53
L2	Zero	27.65	20.88	48.53	16.08	32.45
L3	Graded	15.99	19.77	35.76	17.42	18.34
L4	Graded	14.68	17.78	32.46	14.76	17.70
L5	Unimproved	20.45	19.00	39.45	7.17	32.28
L6	Unimproved	33.31	18.38	51.69	34.15	17.54
G1	Fall Stale Seedbed	25.05	18.38	43.43	27.26	16.17
G2	Conventional Till	46.36	16.38	62.74	35.72	27.02
Mean	Zero	22.00	19.94	41.94	15.95	25.99
Mean	Graded	15.34	18.78	34.11	16.09	18.02
Mean	Unimproved	26.88	18.69	45.57	20.66	24.91

Lakeside District average water usage for main crop: 32.04 ac-in/ac

Garwood District average water usage for main and ratoon crop combined: 67.2 ac-in/ac

Table 3. Ratoon Crop Rice Water Budgets by Management Practices for 2005.

Field	Field Description	Inflow (ac-in/ac)	Rain (in)	Total (in)	Runoff (ac-in/ac)	Field Use (ac-in/ac)
L1	Zero	16.41	3.47	19.88	5.67	14.21
L2	Zero	23.71	5.99	29.70	10.92	18.78
L3	Graded	12.50	2.91	15.41	1.46	13.95
L4	Graded	No Ratoon Crop				
L5	Unimproved	24.11	3.47	27.58	11.82	15.76
L6	Unimproved	No Ratoon Crop				
G1	Fall Stale Seedbed	21.52	8.21	29.73	19.98	9.75
G2	Conventional Till	30.14	7.24	37.38	13.72	23.66
Mean	Zero	20.06	2.91	15.41	8.30	7.12
Mean	Grade	12.50	2.91	15.41	1.46	13.95
Mean	Unimproved	24.11	3.47	27.58	11.82	15.76

Lakeside District average water usage ratoon crop: 17.64 ac-in/ac

Garwood District average water usage for main and ratoon crop combined: 67.2 ac-in/ac

The Use Of Sub-Surface Drip Irrigation For Rice

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Presented by L.T. Wilson
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An experiment is being conducted to determine the feasibility of using subsurface drip irrigation for rice crops. Plots were established at the Texas A&M University Agricultural Research and Extension Center at Beaumont, Texas. In 2001, plots were arranged in two randomized blocks, each consisting of a conventionally flood-irrigated treatment, and two drip-irrigated treatments of 32 and 16-inch tape spacing. Drip irrigation tape was installed at a 6-inch depth. Cadet, which is a short season rice variety, was drill seeded at 80 lbs ac-1 on June 26, 2001. In 2002, two additional blocks were established and the rice variety Cocodrie was