

1997 Cotton Management Economic Notes

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Updated Irrigation Termination

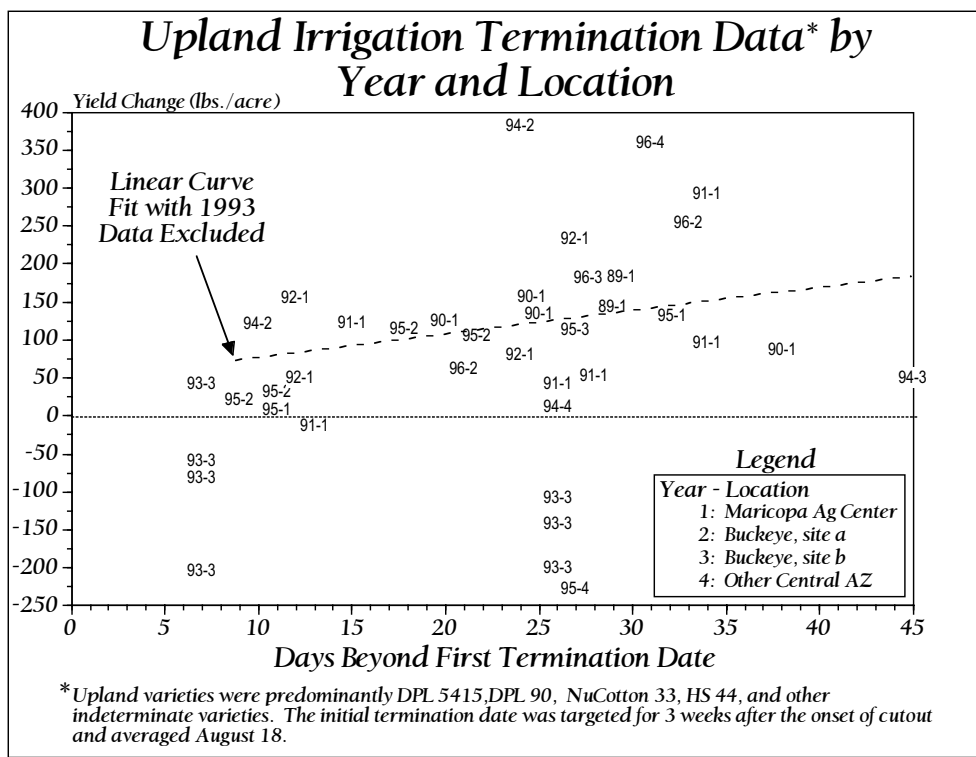
The decision of when to initiate irrigation termination for Upland cotton continues to be debated. Wide variations in yield changes from one season to the next, new technologies, uncertain lint prices, and changes in lint quality from "extending the season" make the irrigation termination decision difficult.

Additional Yield. The figure to the right shows additional lint yield obtained from extending the season beyond initial termination dates. Data was obtained from experiments in Central Arizona led by Silvertooth and Husman. Upland varieties evaluated are relatively indeterminate in nature. Timing for the first irrigation termination plot was targeted for approximately three weeks after the onset of cut-out or when the number of nodes above the top, first position white bloom (NAWB) become less than 5. Days beyond this first termination date are referred to as "extending

the season." This date averaged August 18 by the calendar for the data shown.



The observed range in yield increase or decrease is very dramatic. In 1994, a Buckeye location experienced a 383 lb. yield increase by extending the season 24 days while another 1995 study observed a 232 lb. yield decline. The simple linear

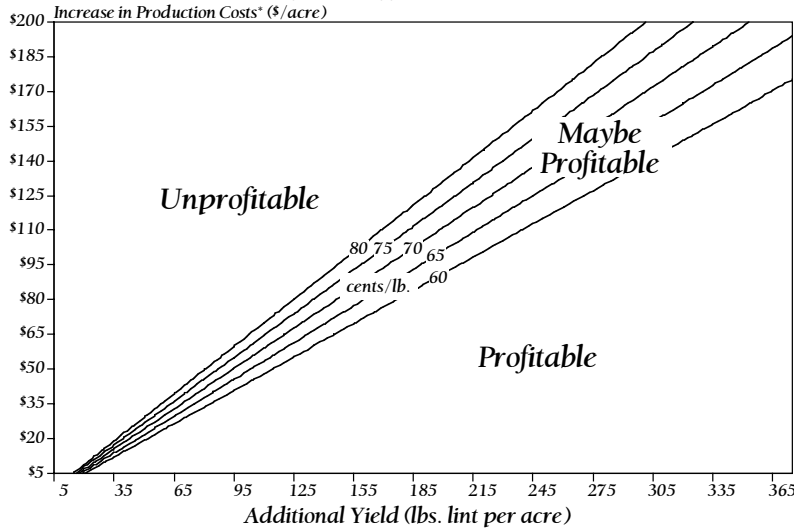


Recent Prices	August 12 1997	
	Upland (¢/lb)	Pima (ELS) (¢/lb)
Spot - uncompressed	70.29	104.50
Oct '97 Futures	74.79	
Dec '97 Futures	74.78	
Dec '98 Futures	74.50	
Adj. World Price	67.32	

Note: Upland Spot for Desert SW grade 31-3, staple 35, add 300 points for compressed bales, Pima Spot for DSW grade 03, staple 46.

curve fit above gives an estimate of what the yield response is from extending the season. The estimated line shown above does not include yield responses for 1993. That is, insect pressures and other conditions for 1993 are treated as out of the norm. The estimated fit also gives equal weight to all remaining years rather than equal weight to each plot or point of data. After an initial 80lb. yield increase around day 10, estimated yield increases at 3.0 lbs./day. More flexible functional forms estimate a yield increase plateau of around 145 to 150 lbs. 35 days beyond

Lint Price (¢/lb.) Required to Justify "Extending the Season" for Different Cost Increases*



* Additional costs for ginning, harvest, and opportunity cost of money are accounted for in the figure. Production Cost increases include water, insecticide, defoliation, and other growing costs.

the first termination date. But is this yield increase profitable with higher production, harvest, ginning, and other costs?

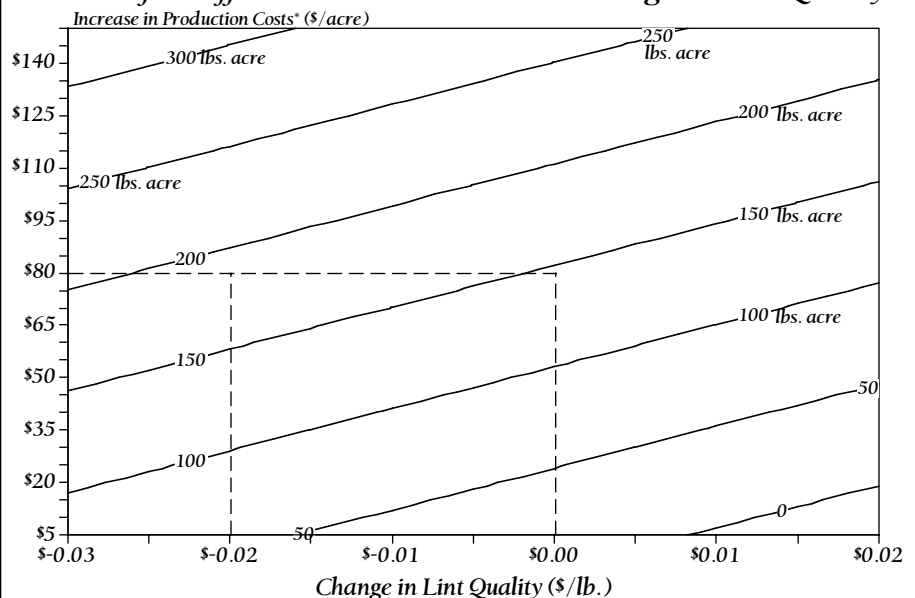
Production Costs. Extending the season will increase the cost of insecticide applications, water, defoliation, and possibly other production costs. For illustration, say that two additional insecticide applications at \$15/acre, two additional irrigations at \$19/acre, and increased defoliation costs of \$12/acre are required. The figure above indicates that for this \$80/acre increase in production cost it would take 146 lbs. of lint to just break-even from extending the season with 70¢ cotton. These cost estimates may differ substantially even within a county due to different water sources and insect pressures.

Harvest, Ginning and Finance. Harvest, hauling, and ginning costs are accounted for in the above figure at \$.20/lb. Additional cottonseed is assumed to yield 160% of additional lint yields with a value of \$.05/lb. Extending the season also means that the crop will be sold at a later date, increasing finance charges. Funds are charged at an annual rate of 10% with a base yield of 1,200 lbs., amounting to \$4.83/acre for 21 days.

Quality. Extending the season has been known to reduce the number of immature fibers and improve quality, but extending the season also risks deteriorating quality with adverse weather and insect pressures. Lint quality changes have a dramatic impact on profit since both the "base yield" and additional yield are affected. Using a base yield of 1,200 lbs./acre, the figure in the lower right corner gives the additional yield required to justify extending the season for a range of lint quality changes from -3¢/lb. to +2¢/lb. A higher base yield would increase (decrease) the amount of additional lint required to break-even with a degradation (enhancement) in lint quality. As highlighted with the dashed lines below, the \$80 cost increase illustrated earlier requires 188 lbs. instead of 146 lbs. to break-even with a 2¢/lb. quality degradation. That is, more than 188 lbs. of additional lint are required before extending the season becomes profitable with a 2¢/lb. degradation in lint quality.

Risk Return Assessment. The decision of when to terminate also depends on other factors, including the amount of risk you are able and willing to take on. If your economics for extending the season look promising, a wise strategy may be to diversify by extending the season on part of your acreage while terminating the rest.

Yield Increases Needed to Justify Extending the Season with 70¢ Cotton for Different Cost Increases and Changes in Lint Quality



* Additional costs for ginning, harvest, and opportunity cost of money are accounted for in the figure. Increase in production costs are for water, insecticide, defoliation, and other growing costs.