

TITLE:

Timing the Last Irrigation Using COTMAN in a LEPA Irrigation System at AG-CARES, Lamesa, TX, 2003.

AUTHORS:

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MATERIALS AND METHODS:

Treatments:	400, 600 and 800 heat units (HU) past cutout
Cutout:	physiological, having reached five nodes-above-first-position-white-flower(NAWF) prior to August 11
Cutout date:	July 16
Experimental design:	Randomized complete block with four replications
Plot size:	8 rows by 180 feet
Planting Date:	May 8
Variety:	PM2628RR
Irrigation:	LEPA irrigation with socks
Applied:	5.1 inches
Capacity:	0.4 inches per pass
Cost:	\$2.48/ pass or \$6.20/ inch (Costs include the demand charge.)
Rainfall:	6.6 inches (all between May 19 through June 9)
Harvest aids:	Cotton was terminated, according to the COTMAN rule of 850 HU past cutout, on October 3, with 8 ounces of Ginstar ⁷ and one pint of Boll D ⁷ in 10 gallons per acre of formulated solution.
Harvest:	Cotton from the middle four rows of each plot was machine harvested and weighed on October 15.

RESULTS AND DISCUSSION:

Due to the design of the study area, the actual heat unit accumulation past cutout had a range of about 20 HU by the time the pivot passed through all of the corresponding plots (Table 1).

Lint weight per acre (yield) increased significantly as the accumulation of heat units past cutout for scheduling the final irrigation also increased (Table 2). Both the 600HU and 800HU past cutout treatments yielded significantly more lint weight per acre than did the 400HU past cutout treatment, but they did not differ from each other.

Micronaire also increased as the accumulation of heat units past cutout for scheduling the final irrigation increased while fiber length, fiber length uniformity, fiber strength and color grades were virtually unaffected. (Table 3). These fiber qualities were used to calculate a loan rate per lint pound, and the loan rate was multiplied by the lint yield to determine the lint value per acre (Table 4). There were no differences between treatments for loan rate; however, all three treatments were below the Base Loan Rate primarily due to short fiber length. The lint value per acre for the 600HU and 800HU treatments differed significantly from the 400HU treatment but did not differ from each other.

The 600HU past cutout treatment received an additional 0.8 inches of irrigation, or two more passes, for an additional irrigation cost of \$4.96 compared to the 400HU past cutout treatment. The 800HU past cutout treatment received an additional 1.6 inches of irrigation, or four more passes, for

an additional irrigation cost of \$9.92 and \$4.96 compared to the 400HU and 600HU past cutout treatments respectively. The additional irrigations in both the 600HU and 800HU past cutout treatments returned a net profit per acre compared to the 400HU past cutout treatment. However, the 800HU past cutout treatment returned a negative net return per acre when compared to the 600HU past cutout treatment (Table 4).

In the absence of late-summer and/or early-fall rains, terminating LEPA irrigation at 400 HU past cutout or before is too soon. The most economical target for timing the termination of LEPA irrigation appears to be when 600HU past cutout has been accumulated.

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Table 1. Actual HU accumulation past cutout and the corresponding dates in which irrigation was terminated using different HU accumulations past cutout in a LEPA irrigation system. AG-CARES Farm, Lamesa, Texas. 2003.

Target HU Accumulation	Actual HU Accumulation	Date of Last Irrigation
400	410 - 437	August 3 - 4
600	628 - 641	August 12 - 13
800	807 - 826	August 22 - 23

Table 2. Yield (lint pounds/acre) in which irrigation was terminated using different HU accumulations past cutout in a LEPA irrigation system. AG-CARES Farm, Lamesa, Texas. 2003.

Target HU Accumulation	Lint Weight (lbs.) Per Acre
400	294 b ^{1/}
600	460 a
800	481 a

^{1/} Means in a column followed by the same letter are not different (P=0.10, LSD).

Table 3. Fiber quality measures in which irrigation was terminated using different HU accumulations past cutout in a LEPA irrigation system. AG-CARES Farm, Lamesa, Texas. 2003.

Fiber Quality Factors	Accumulated Heat Units Past Cutout		
	400	600	800
Mic	3.8 (+) ^{1/}	4.2 (+)	4.8
Length ^{2/}	0.99 (32)	1.01 (32)	1.00 (32)
Strength	29.5 (+)	30.8 (+)	29.9 (+)
Uniformity	81.2	82.1	82.6
Color	31	31	31

^{1/} (+) indicates the fiber measure fell within the premium range

^{2/} Length given in 1/100ths inches; number in parenthesis is length given in 32nds

Table 4. Loan rate per lint pound, lint value per acre and net return per additional irrigation in which irrigation was terminated using different HU accumulations past cutout in a LEPA irrigation system. AG-CARES Farm, Lamesa, Texas. 2003.

Target HU Accumulation	Loan Rate (points / lint lb)	Lint Value (\$ / Acre)	Net return (\$) per additional irrigation compared to the 400HU treatment	Net return (\$) per additional irrigation compared to the 600HU treatment
400	4950 a ^{1/}	145.48 b	----	----
600	5001 a	231.79 a	40.68	----
800	4871 a	234.89 a	19.87	-0.93

1/ Compared to the 200 HU past cutout treatment.

2/ Means in a column followed by the same letter are not different (P=0.10, LSD).