Amount of Cotton Evapotranspiration Replacement for Various 120-Acre Center Pivot Irrigation Pumping Capacities and Delivery Efficiencies

Pumping capacity delivered to center pivot					Acre-inches/acre/day	Inches/day delivered at irrigation application efficiency (%)			For 85% irrigation application efficiency % ET replacement if actual crop ET (in inches/day) is:			
GPM	GPM/acre	Gallons/day	Acre-feet/day	Acre-inches/day	at 100% efficiency	95 (LEPA, SDI)	85 (Low elevation spray)	75 (Poor spray)	0.25 (moderate)	0.35 (high)	0.45 (very high)	0.55 (extreme)
100	0.8	144,000	0.44	5.3	0.04	0.04	0.04	0.03	15	11	8	7
200	1.7	288,000	0.88	10.6	0.09	0.08	0.08	0.07	30	21	17	14
300	2.5	432,000	1.33	15.9	0.13	0.13	0.11	0.10	45	32	25	20
400	3.3	576,000	1.77	21.2	0.18	0.17	0.15	0.13	60	43	33	27
500	4.2	720,000	2.21	26.5	0.22	0.21	0.19	0.17	75	54	42	34
600	5.0	864,000	2.65	31.8	0.27	0.25	0.23	0.20	90	64	50	41
700	5.8	1,008,000	3.09	37.1	0.31	0.29	0.26	0.23	105	75	58	48
800	6.7	1,152,000	3.53	42.4	0.35	0.34	0.30	0.27	120	86	67	55
900	7.5	1,296,000	3.98	47.7	0.40	0.38	0.34	0.30	135	97	75	61
1000	8.3	1,440,000	4.42	53.0	0.44	0.42	0.38	0.33	150	107	83	68

Note: 12 acre inches = ~326,000 gallons

Texas High Plains research indicates that ~75% ET replacement can generally maximize water-use efficiency (lbs of lint/inch of water) but not necessarily total yield/acre.

Provided by Dr. Randy Boman
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Total Amount of N Delivered (Expressed in Pounds N Per Acre) from Varying Irrigation Water NO_3-N Concentrations and Irrigation Amounts

Irrigation well water NO_3-N concentration (ppm)	Irrigation water applied (acre-inches)								
	6	9	12	15	18	21	24	27	30
5	7	10	14	17	21	24	28	31	35
10	14	21	28	35	41	48	55	62	69
15	21	31	41	52	62	72	83	93	104
20	28	41	55	69	83	97	110	124	138
25	35	52	69	86	104	121	138	155	173

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This table is based upon this assumption:
lbs N/acre applied through irrigation = NO_3-N (ppm) x 0.23 x acre-inches of irrigation water applied

Note: These values are only valid for N when it is expressed as NO_3-N in irrigation water (not just as NO_3).