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/acre/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.

Salinity will complicate this response.

Provided by Dr. Randy Boman
Research Director and Cotton Extension Program Leader
OSU Southwest Research and Extension Center, Altus