Appendix E

Plots of Volumetric Direct Transpiration versus Tree Diameter which yield *k*-values from Observation Points: MW6, P4, P25

List of Figures

E Appendix

Using the Groundwater Recession Comparison method and White's Equation, 22 direct transpiration rates were calculated from data observed at observation points MW6, P4, and P25. These rates were multiplied by representative areas (900 ft^2 and 2500 ft^2) to yield volumetric direct transpiration rates for those areas. The trees within each representative area were counted and their diameters measured. The example shown in Table E-1 was performed 44 times, utilizing 22 values for direct transpiration and two representative areas. Each calculation yielded a value for volumetric direct transpiration for each tree within each representative area. When per tree volumetric direct transpiration (Q^T_{DT}) was plotted against tree diameter, a power equation was formed:

$Q^T_{DT}=kx^2$ where: Q^T_{DT}= gal/day-tree

k = per tree volumetric direct transpiration coefficient, gal-ft/ft3

x = Diameter at breast height, DBH

Table E-1 Sample calculation for estimating the volumetric transpiration rates of trees within a nine-cell (900 ft^2) area surrounding the observation point (MW6).

MW6-AVERAGE MONTHLY TRANSPIRATION VALUES DISTRIBUTED OVER SURROUNDING 900 SQ. FT AREA

MAY 6, 2004 TRANSPIRATION RATE RECORDED AT MW6 = 0.00999 ft/day

$Q_{DTi} = T_{DT} \times A_{cell} =$ 0.00999 ft/day x 30' x 30' = **8.991** ft^3/day

$\beta_i = (DBH_i)^2$

$Q^T_{DTi} = Q_{DTi} \times \beta / \sum_{1}^{N} \beta_i$

Cell # i,j	Tree #	Circum (feet)	DBH (feet)	β ($feet^2$)	β/Σβ -	Q^T_{DTi} (ft^3/day-tree)	Q^T_{DTi} (gal/day-tree)
11,15	3T4	1.21	0.39	0.1483	0.057	0.512	3.832
	3T5	1.29	0.41	0.1686	0.065	0.582	4.356
11,16	3T1	1.21	0.39	0.1483	0.057	0.512	3.832
	3T2	1.42	0.45	0.2043	0.078	0.706	5.278
11,17	11T1	1.58	0.50	0.2529	0.097	0.874	6.534
12,15	2T1	1.29	0.41	0.1686	0.065	0.582	4.356
	2T2	0.94	0.30	0.0895	0.034	0.309	2.313
	2T3	0.75	0.24	0.0570	0.022	0.197	1.472
13,15	1T12	1	0.32	0.1013	0.039	0.350	2.617
	1T13	1	0.32	0.1013	0.039	0.350	2.617
	1T14	1.42	0.45	0.2043	0.078	0.706	5.278
	1T15	1.13	0.36	0.1294	0.050	0.447	3.342
13,16	1T8	0.75	0.24	0.0570	0.022	0.197	1.472
	1T9	0.75	0.24	0.0570	0.022	0.197	1.472
	1T10	1.42	0.45	0.2043	0.078	0.706	5.278
13,17	1T4	1.25	0.40	0.1583	0.061	0.547	4.090
	1T5	0.67	0.21	0.0455	0.017	0.157	1.175
	1T6	1.17	0.37	0.1387	0.053	0.479	3.583
	1T7	1.29	0.41	0.1686	0.065	0.582	4.356
			SUM	**2.603**	**1.000**	**8.991**	**67.253**

The plot of Q^T_{DT} versus tree diameter for this sample calculation is shown in Figure E-3.

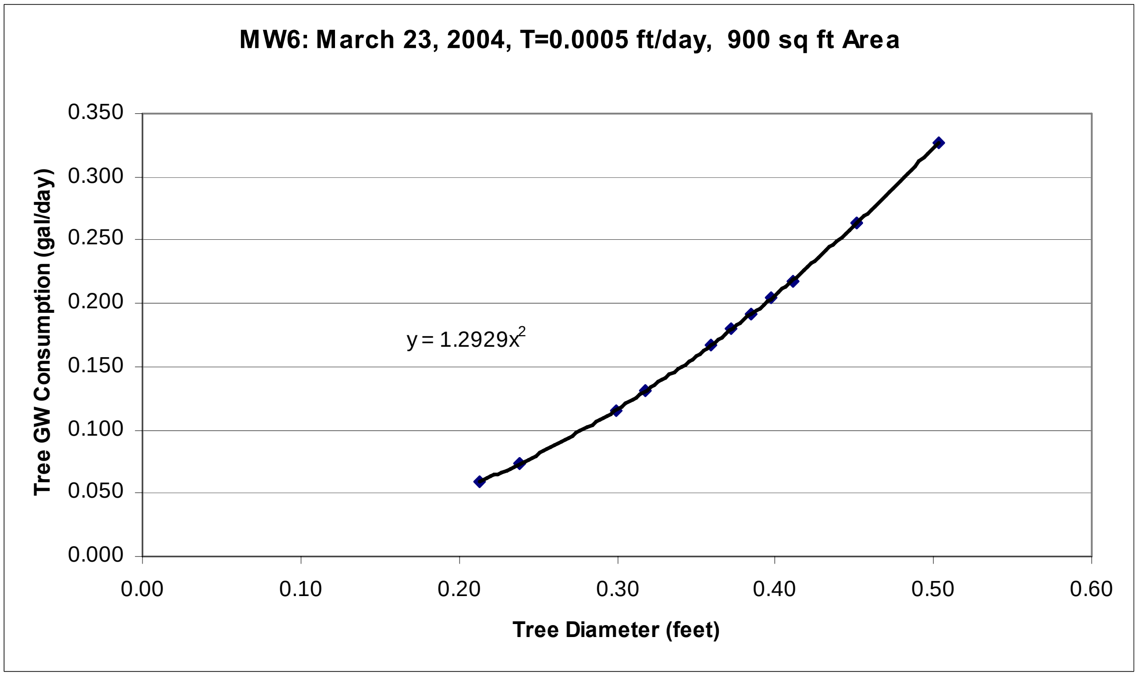

Figure E 1 MW6, March 23, 2004, 900 ft^2

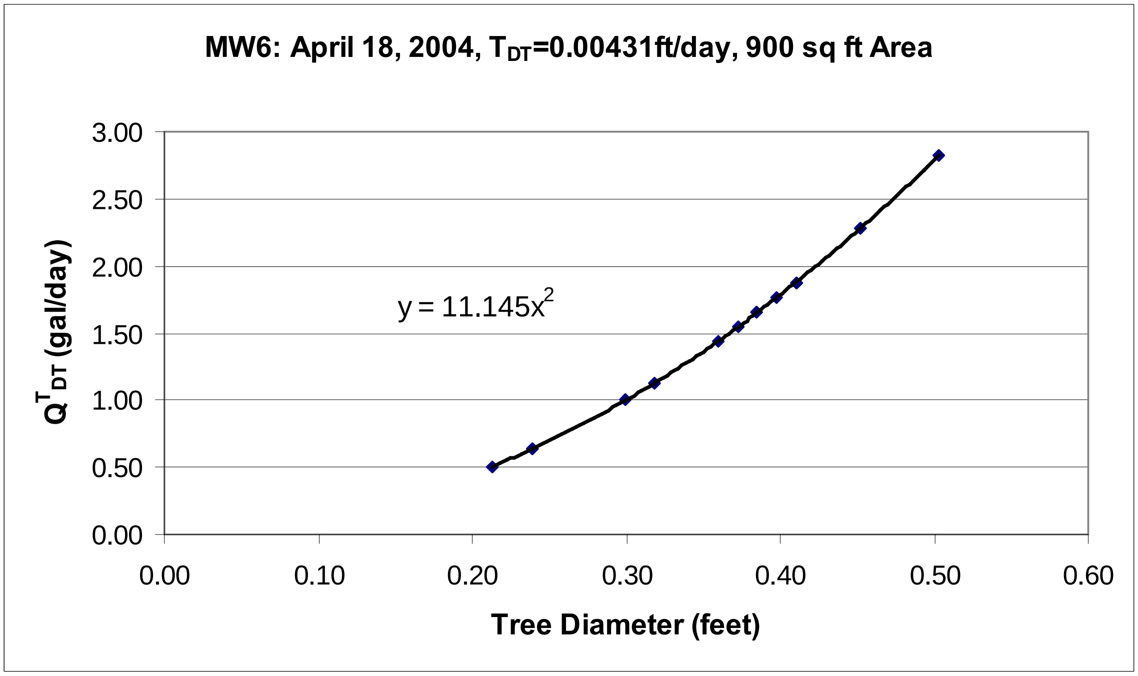

Figure E 2 MW6, April 18, 2004, 900 ft^2

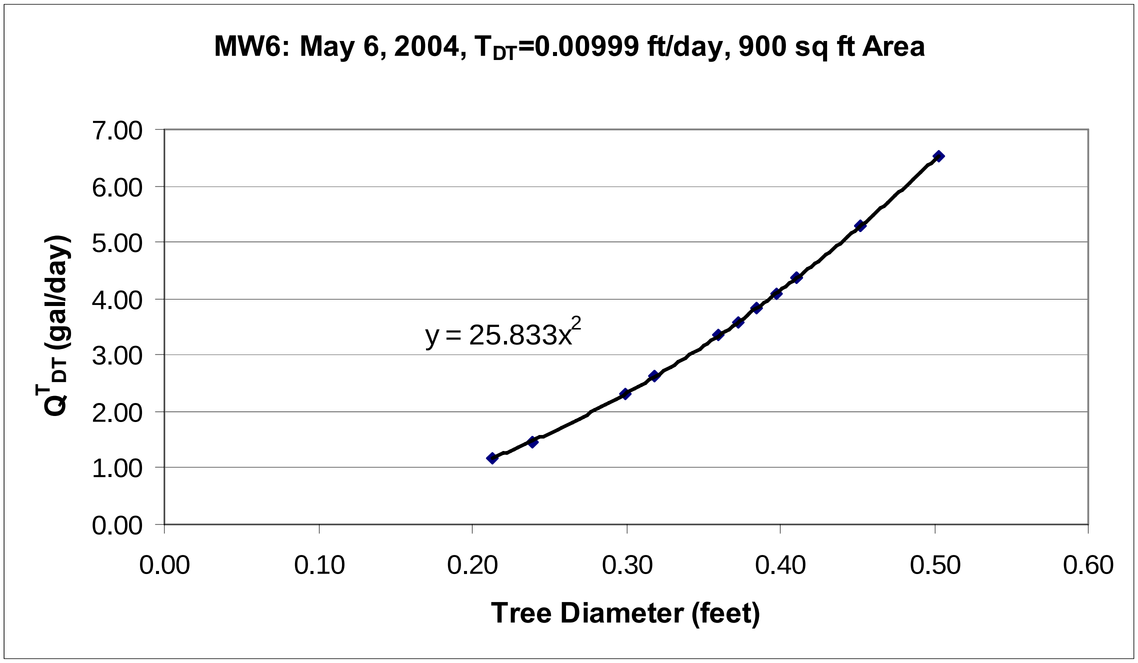

Figure E 3 MW6, May 6, 2004, 900 ft^2

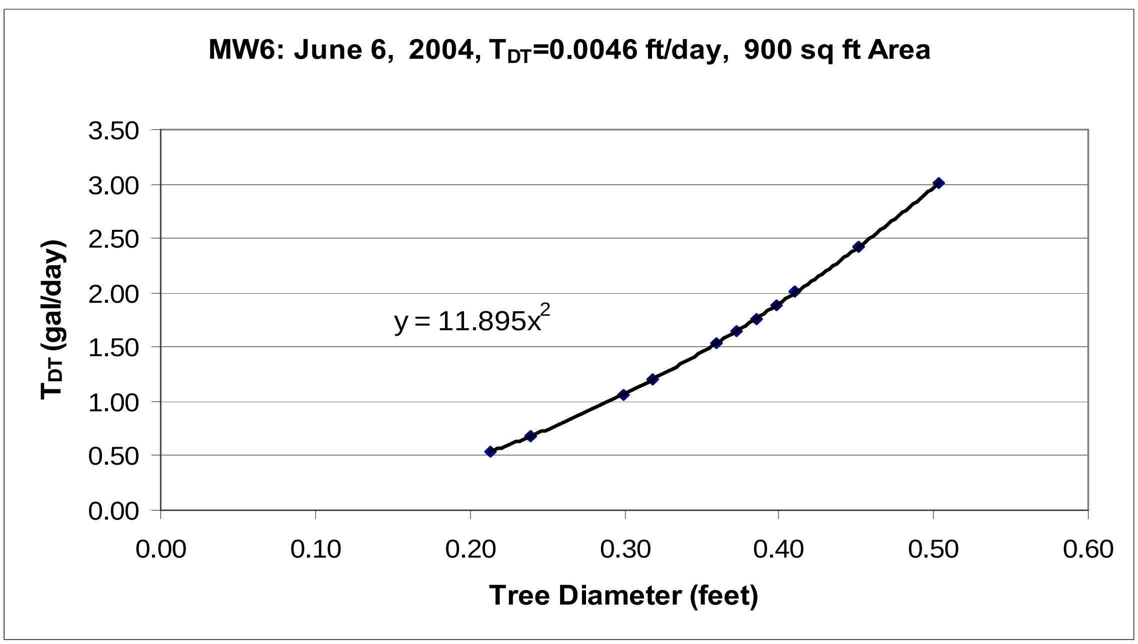

Figure E 4 MW6, June 6, 2004, 900 ft^2

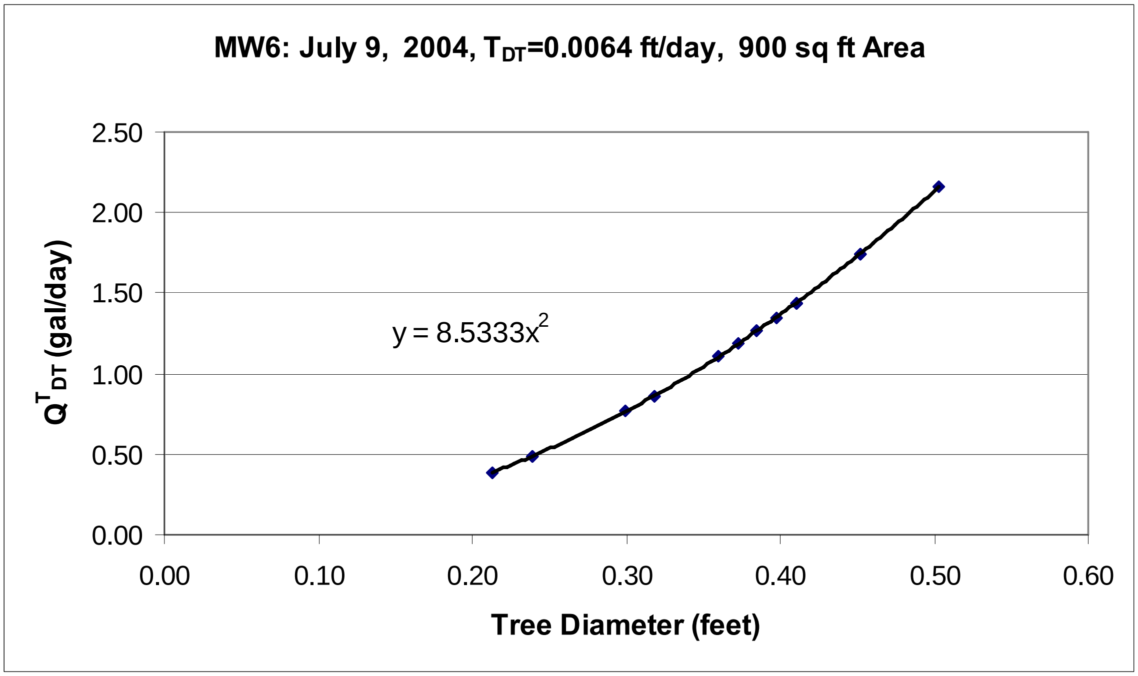

Figure E 5 MW6, July 9, 2004, 900 ft^2

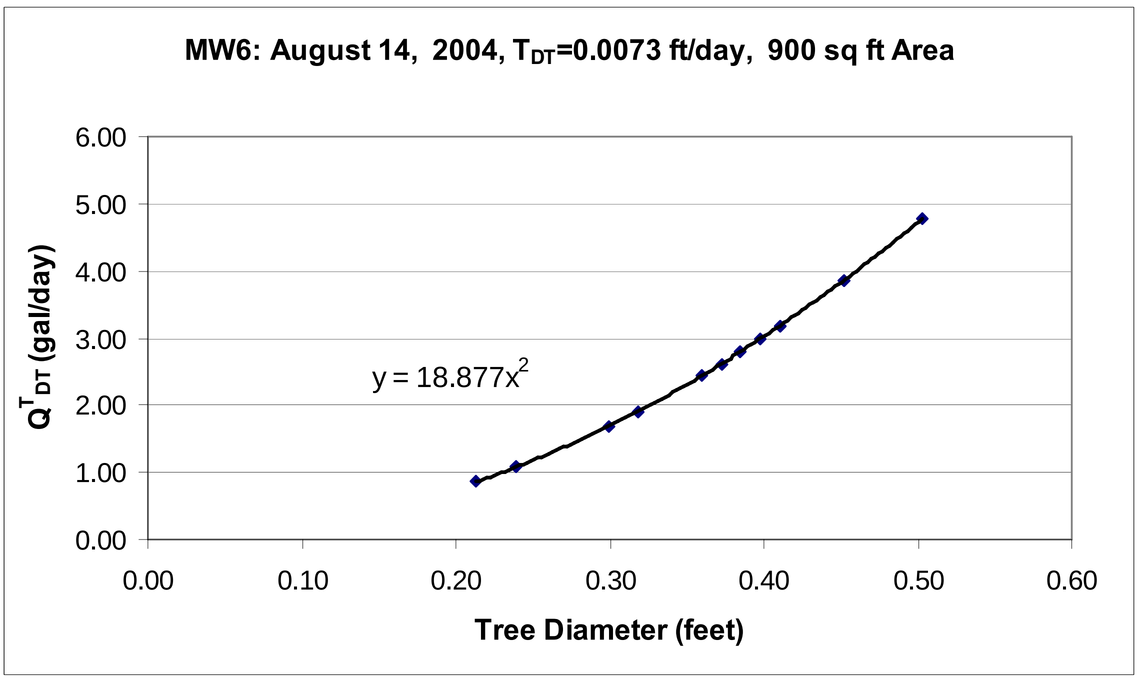

Figure E 6 MW6, August 14, 2004, 900 ft^2

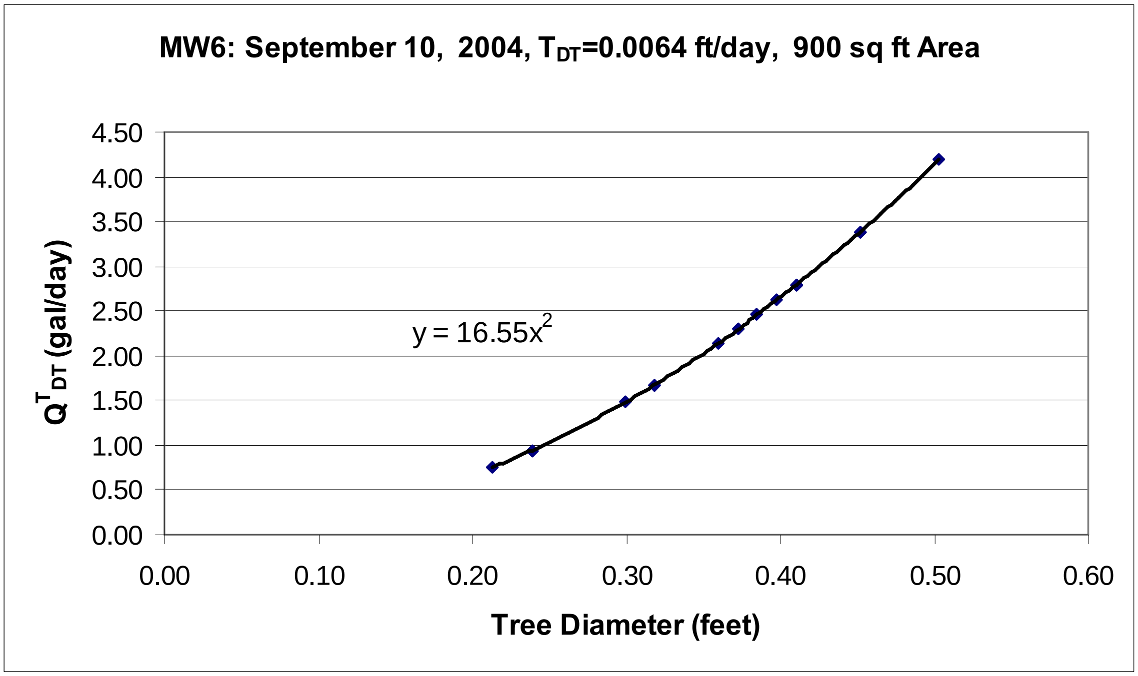

Figure E 7 MW6, September 10, 2004, 900 ft^2

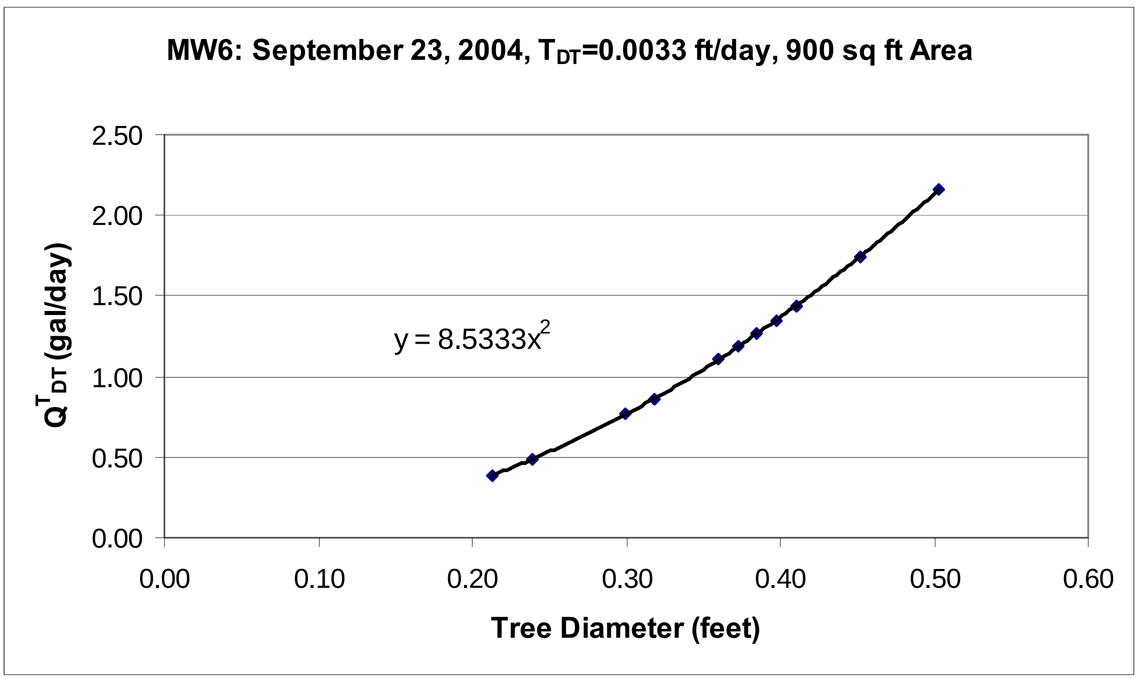

Figure E 8 MW6, September 23, 2004, 900 ft^2

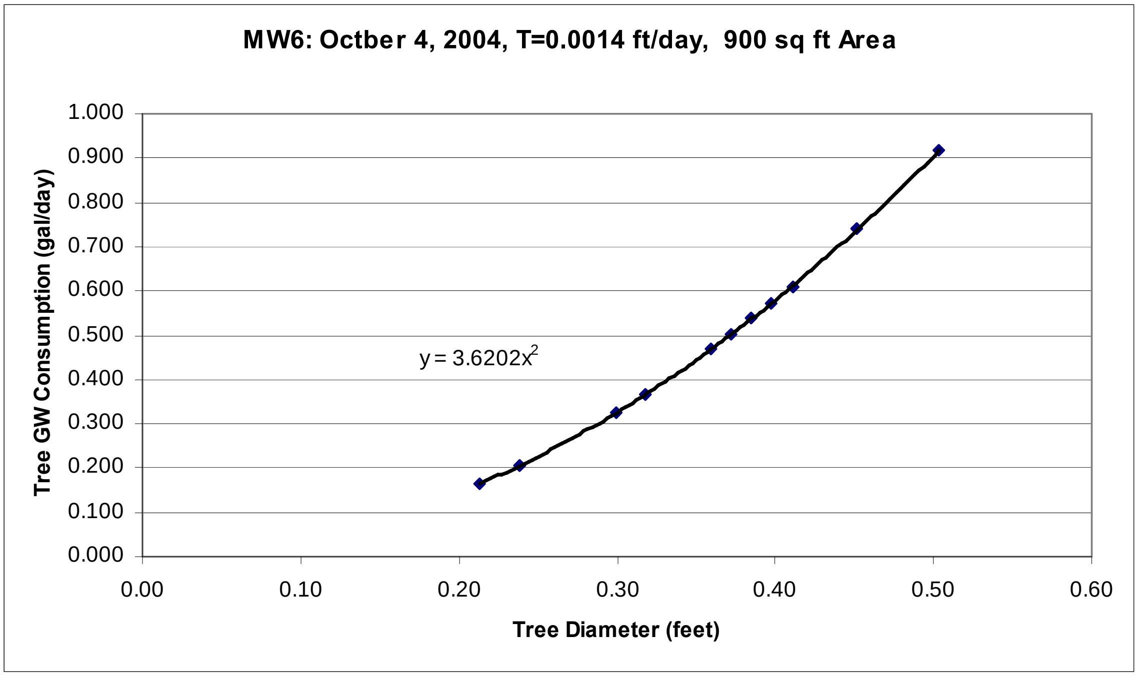

Figure E 9 MW6, October 4, 2004, 900 ft^2

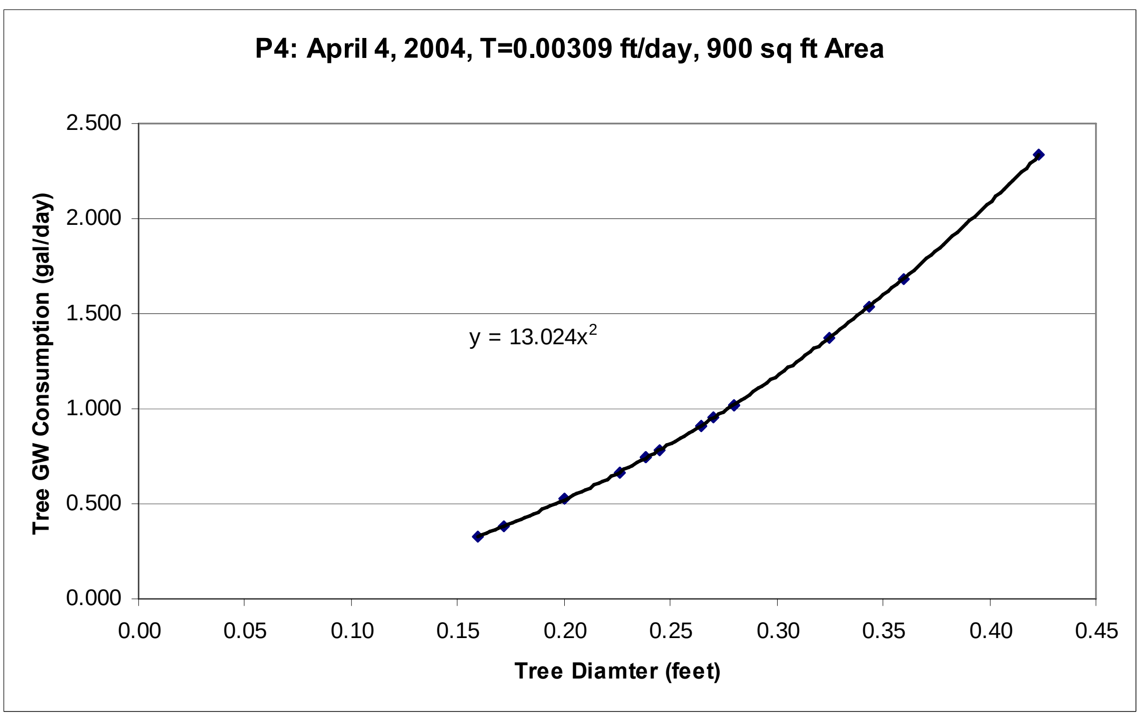

Figure E 10 P4, April 4, 2004, 900 ft^2

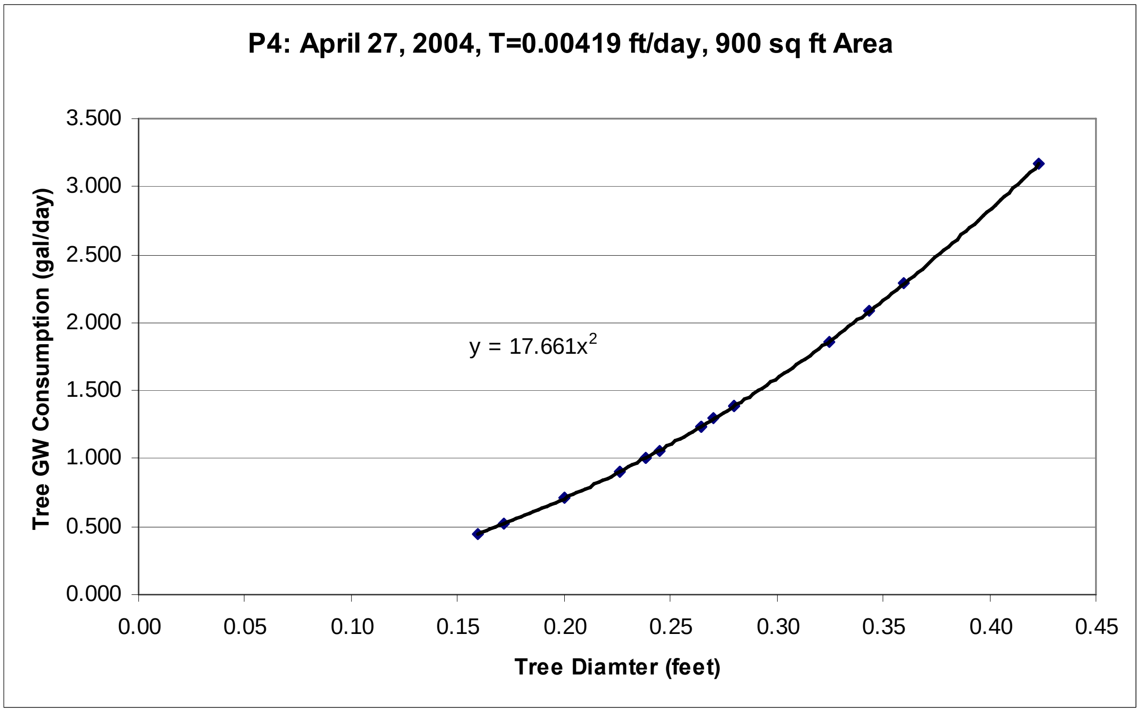

Figure E 11 P4, April 27, 2004, 900 ft^2

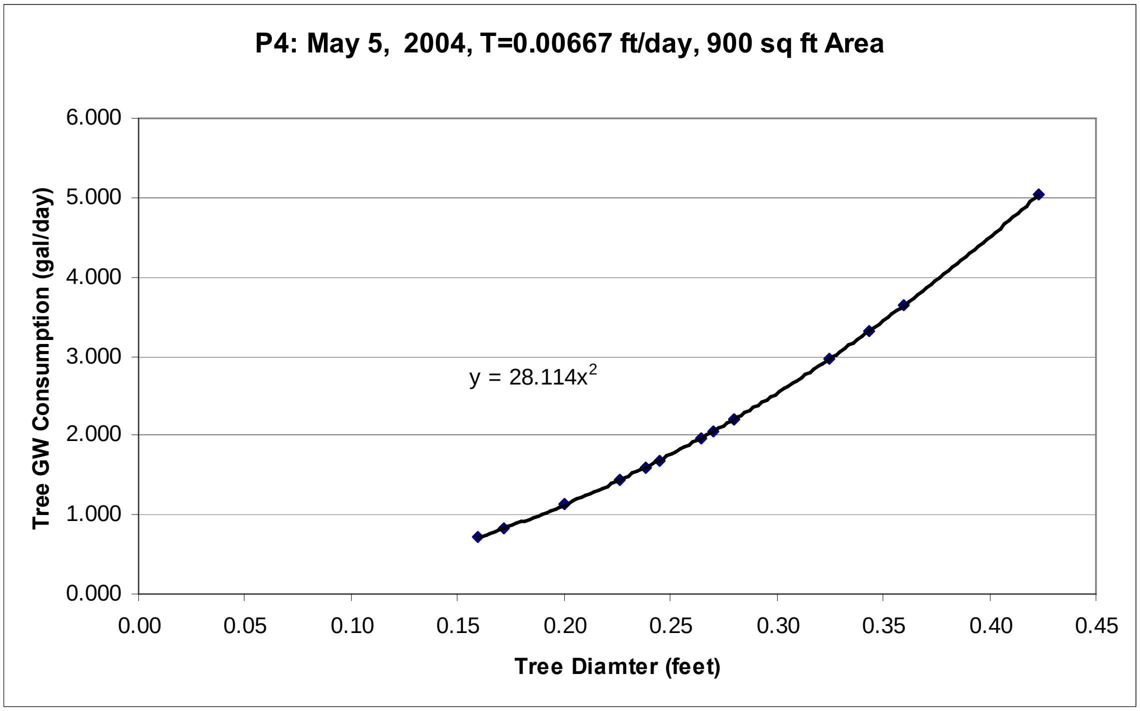

Figure E 12 P4, May 5, 2004, 900 ft^2

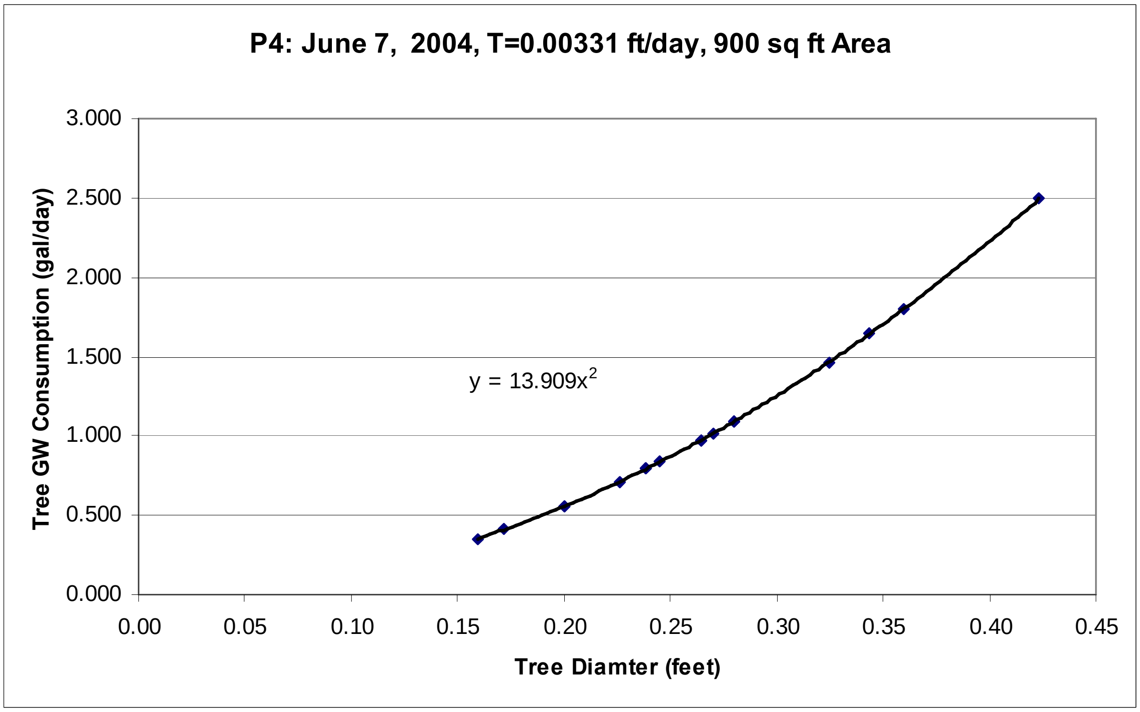

Figure E 13 P4, June 7, 2004, 900 ft^2

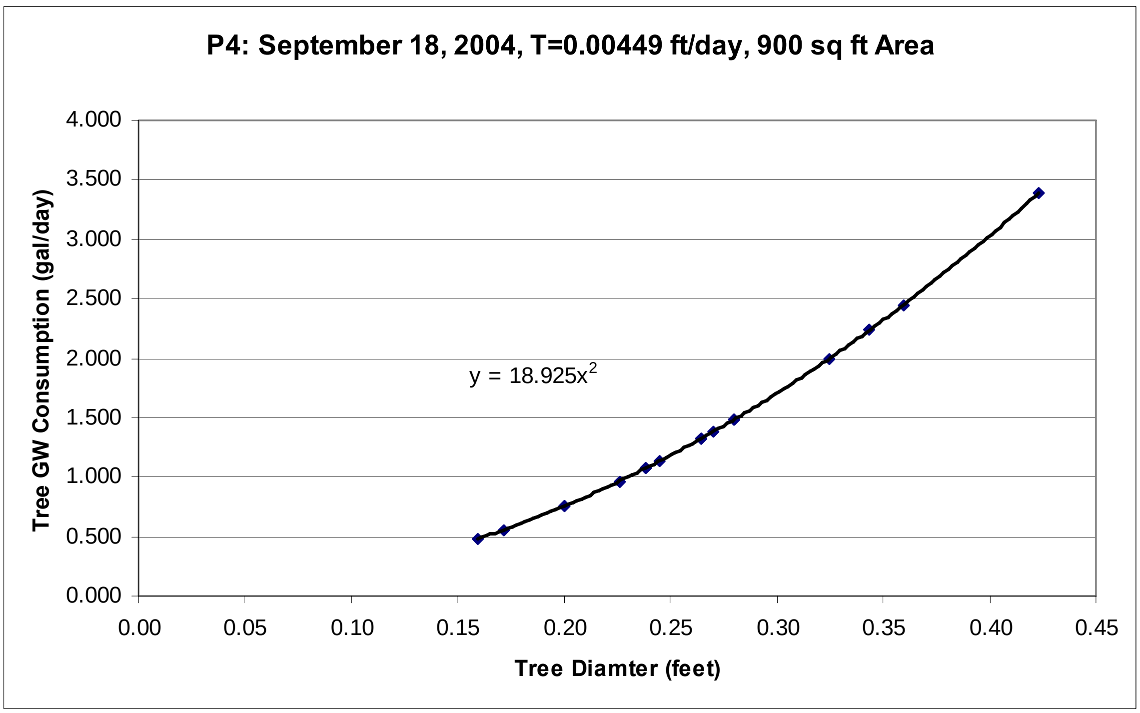

Figure E 14 P4, September 18, 2004, 900 ft^2

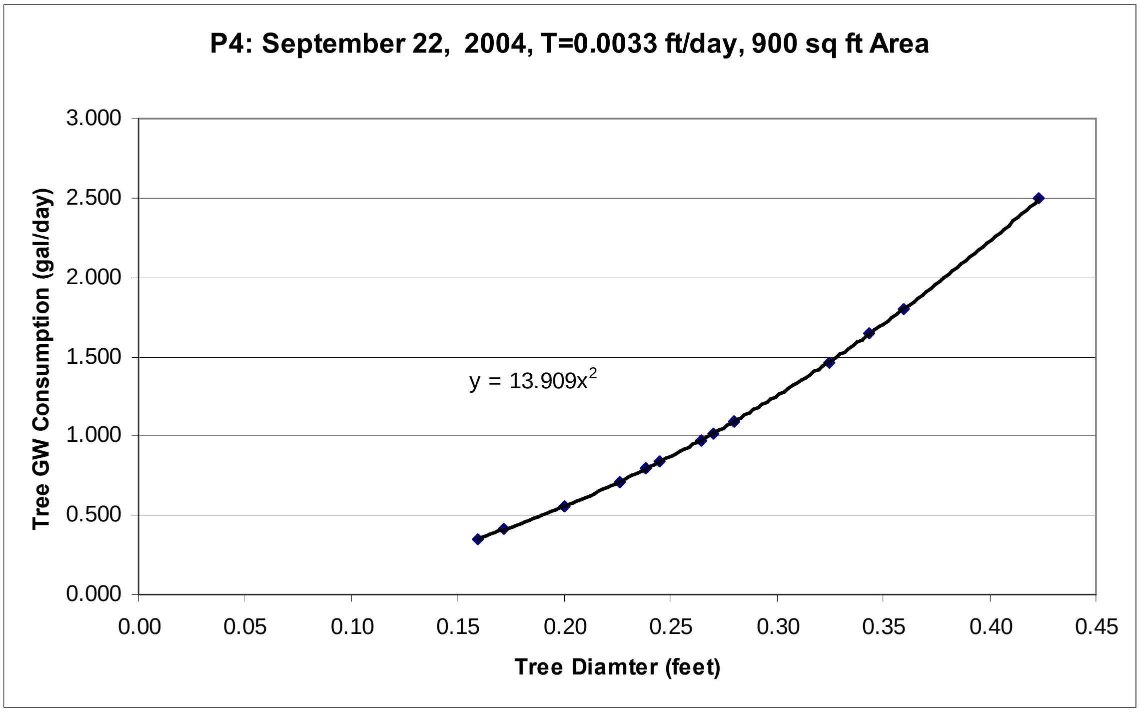

Figure E 15 P4, September 22, 2004, 900 ft^2

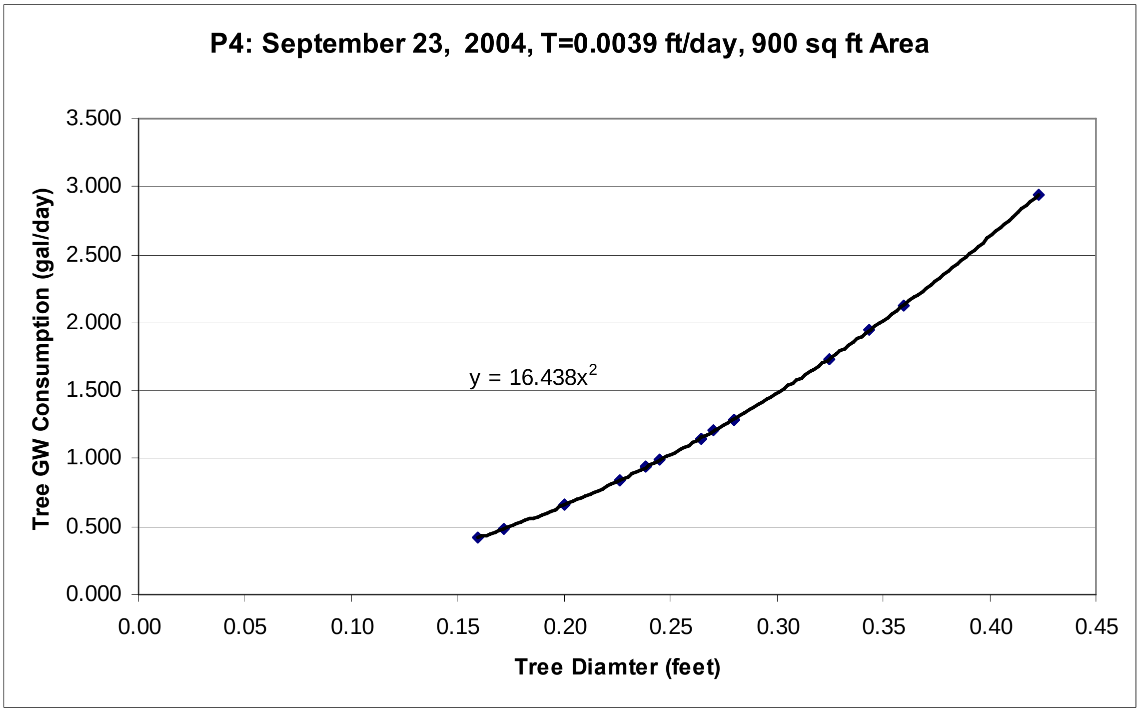

Figure E 16 P4, September 23, 2004, 900 ft^2

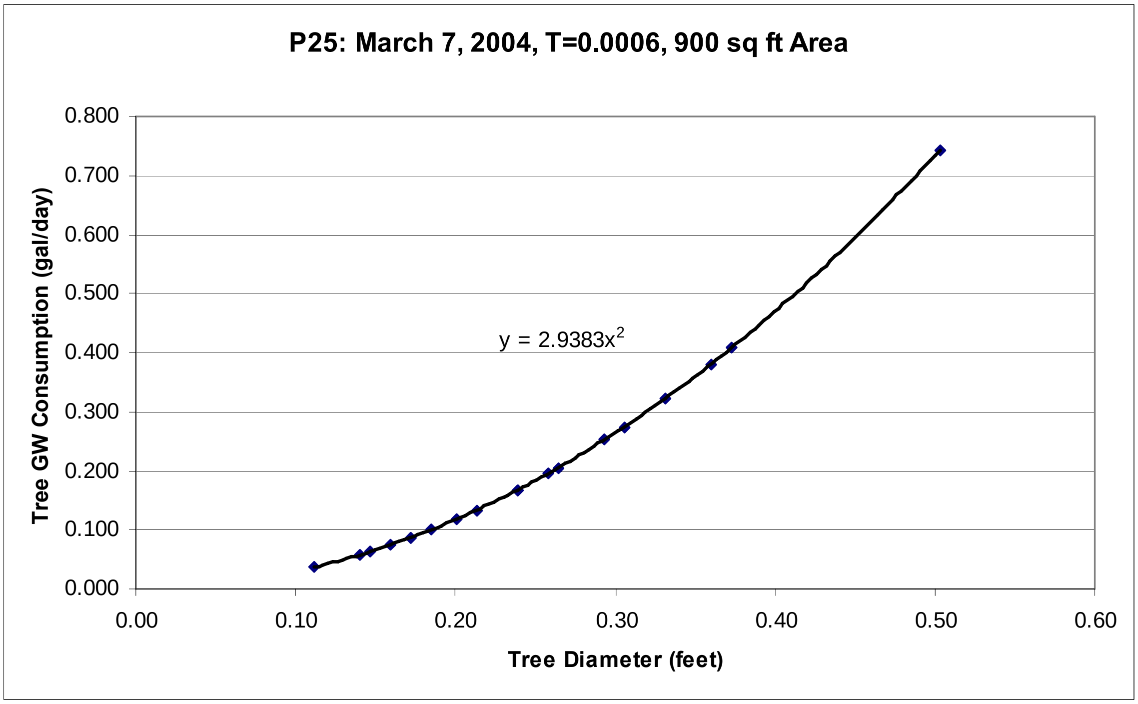

Figure E 17 P25, March 7, 2004, 900 ft^2

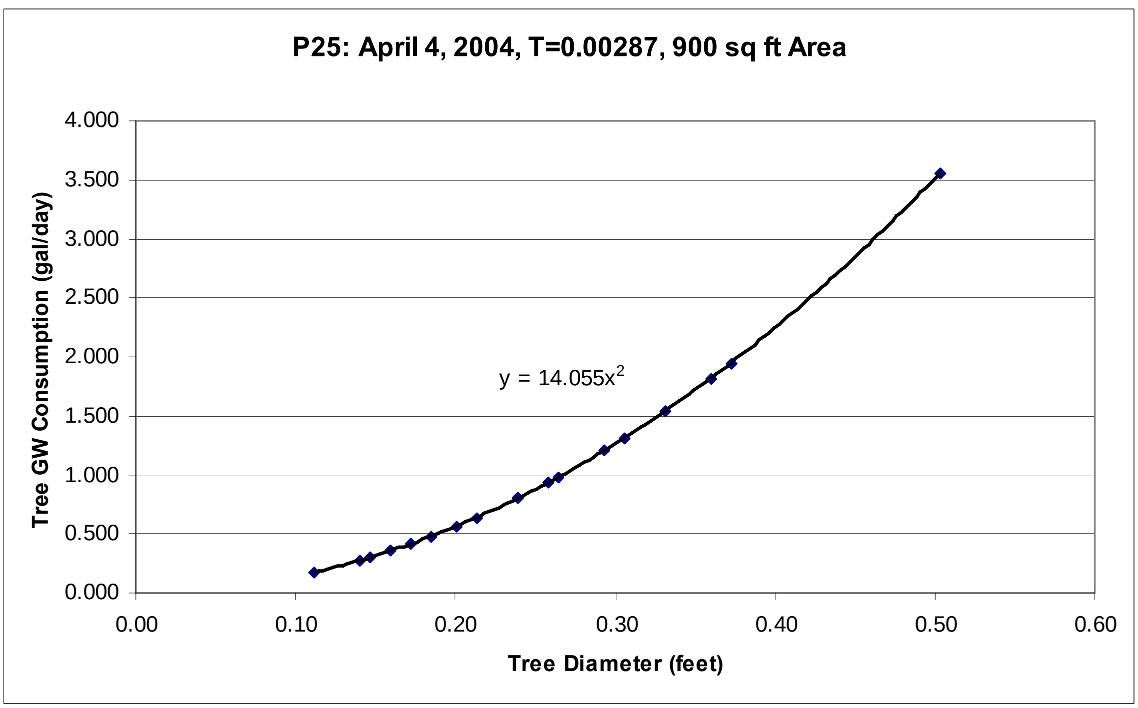

Figure E 18 P25, April 4, 2004, 900 ft^2

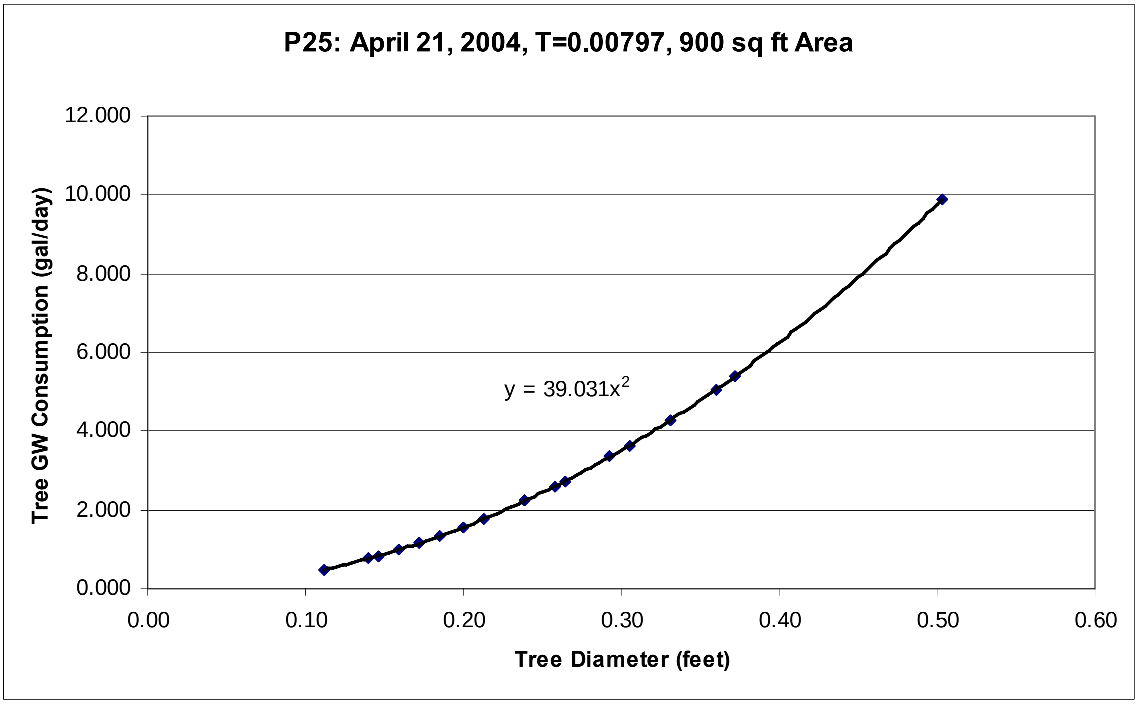

Figure E 19 P25, April 21, 2004, 900 ft^2

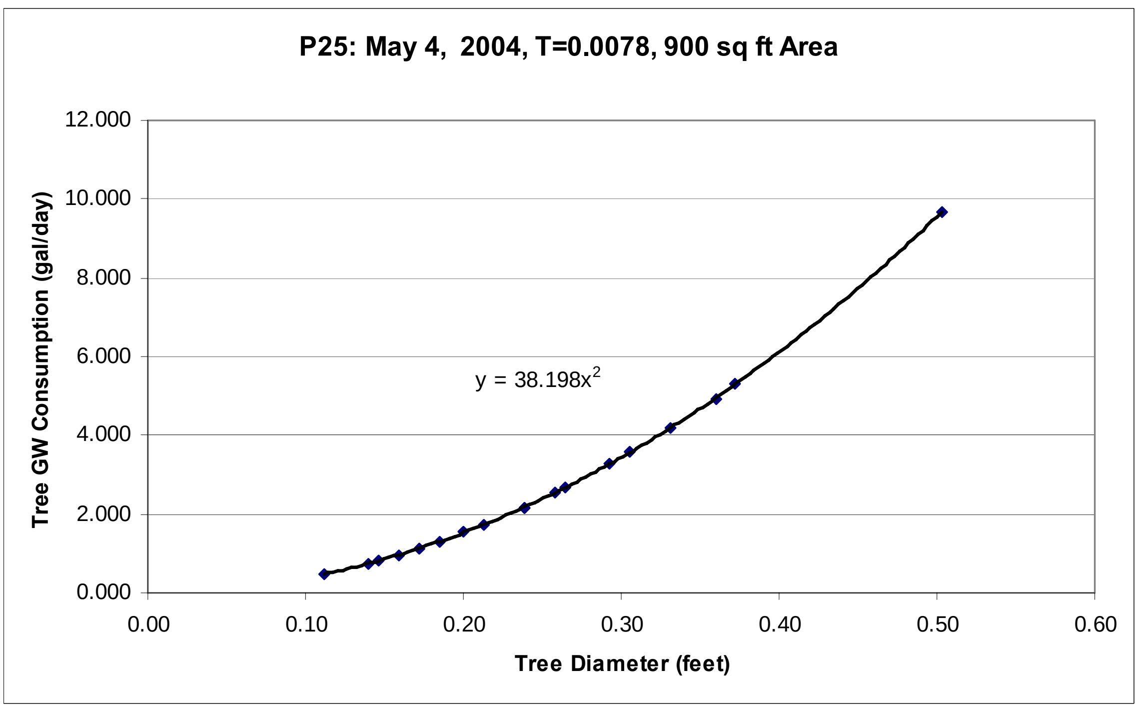

Figure E 20 P25, May 4, 2004, 900 ft^2

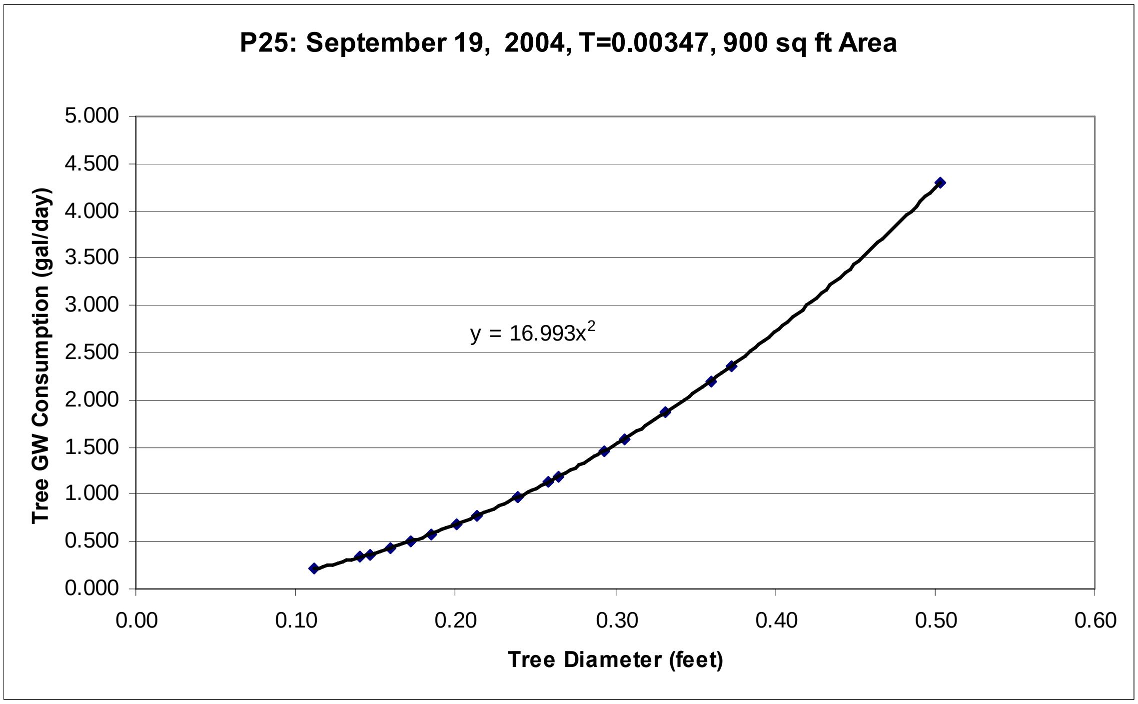

Figure E 21 P25, September, 2004, 900 ft^2

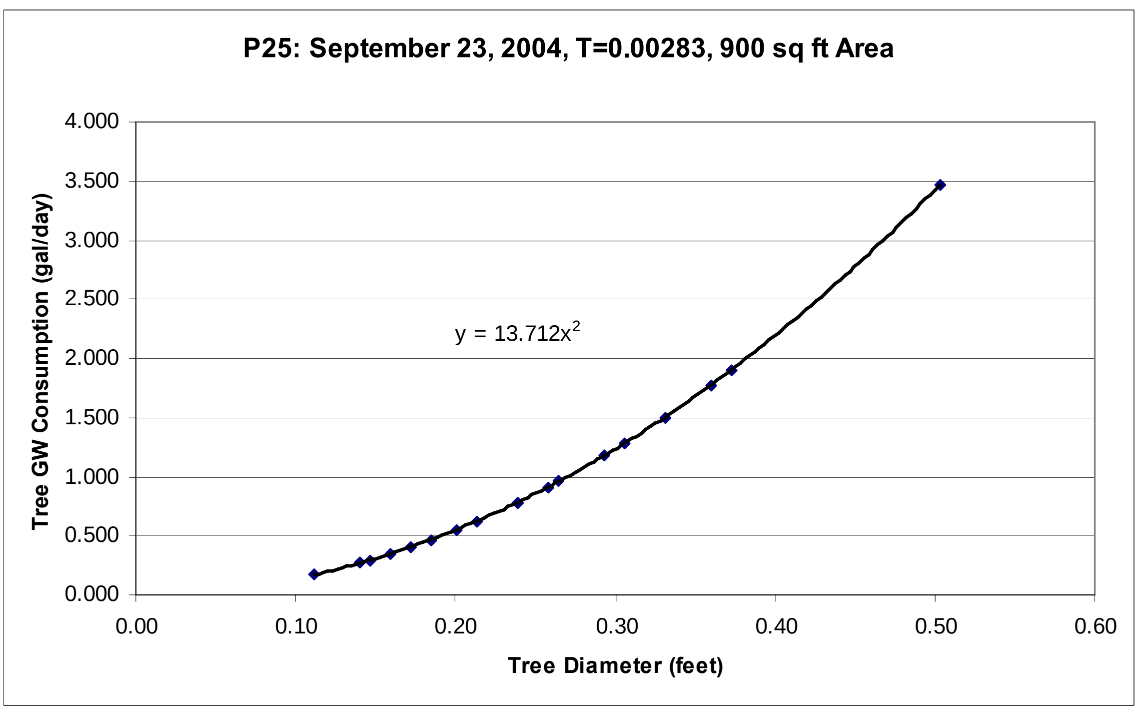

Figure E 22 P25, September 23, 2004, 900 ft^2

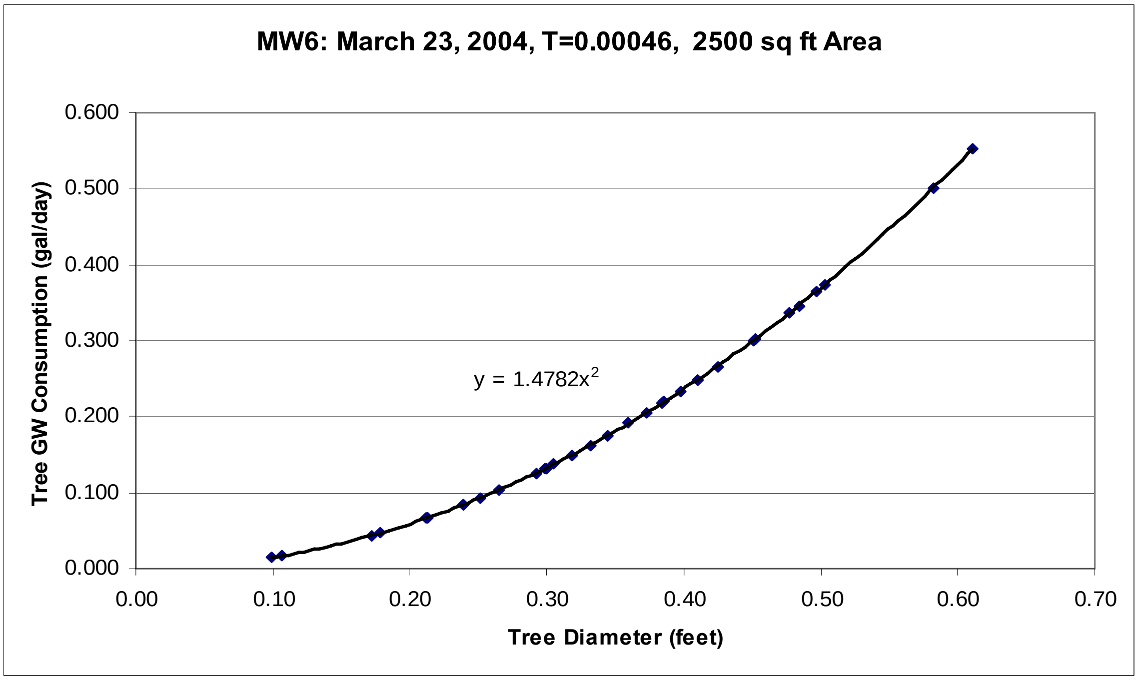

Figure E 23 MW6, March 23, 2004, 2500 ft^2

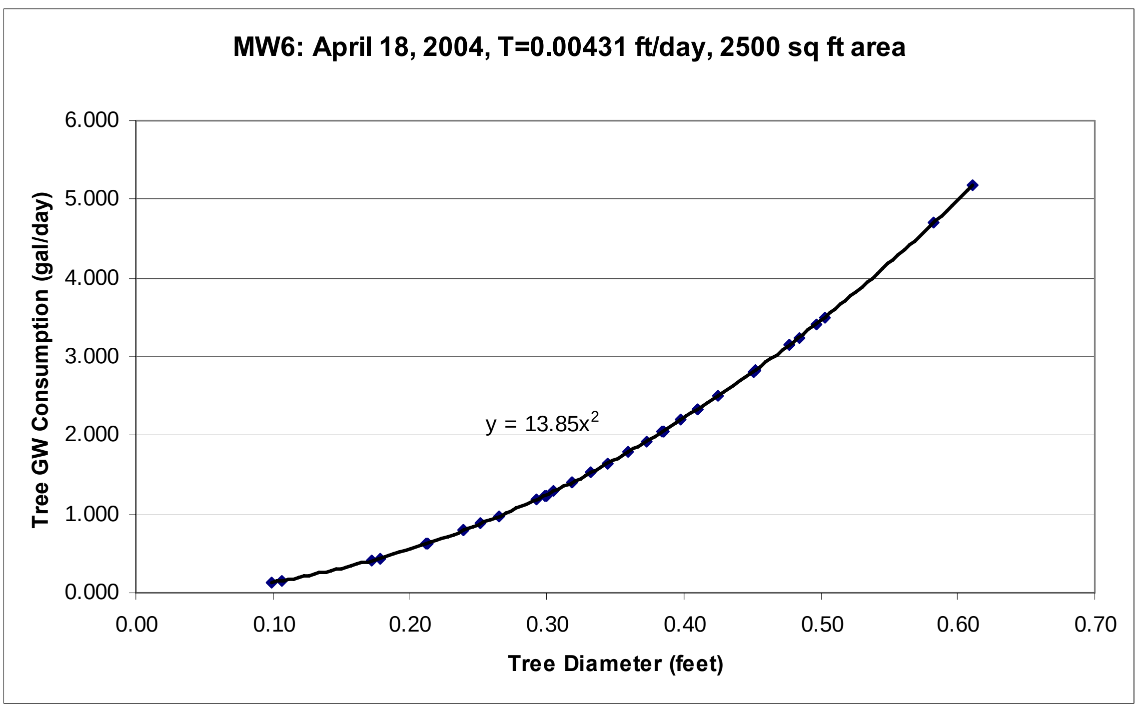

Figure E 24 MW6, April 18, 2004, 2500 ft^2

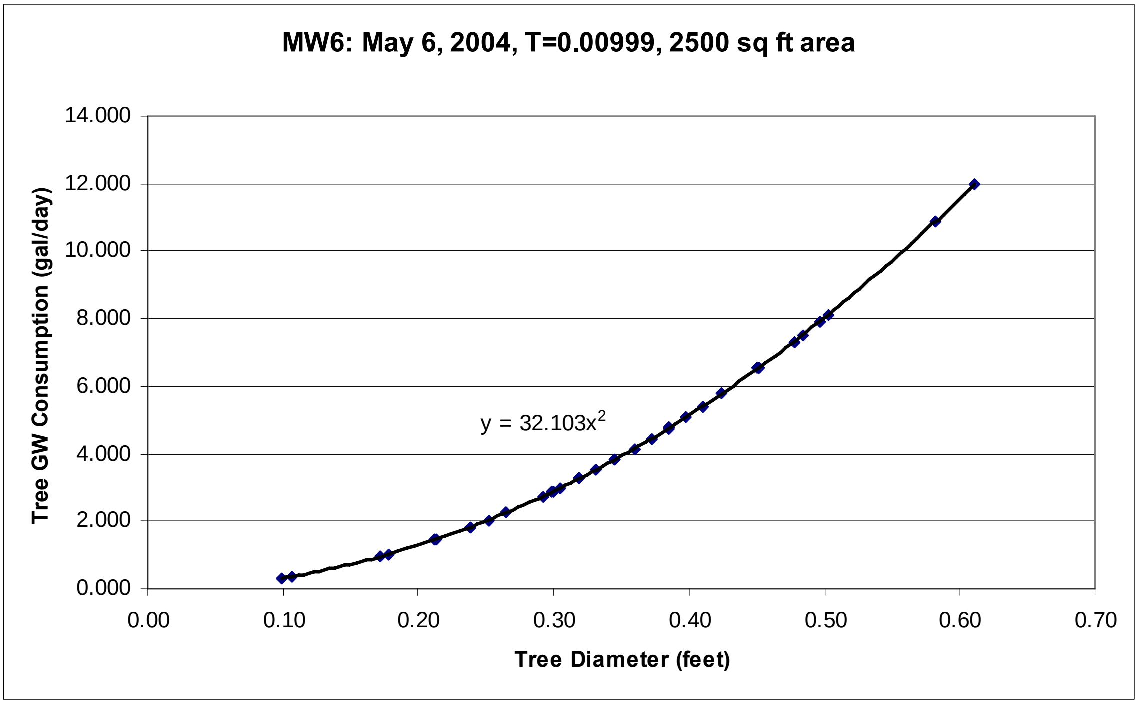

Figure E 25 MW6, May 6, 2004, 2500 ft^2

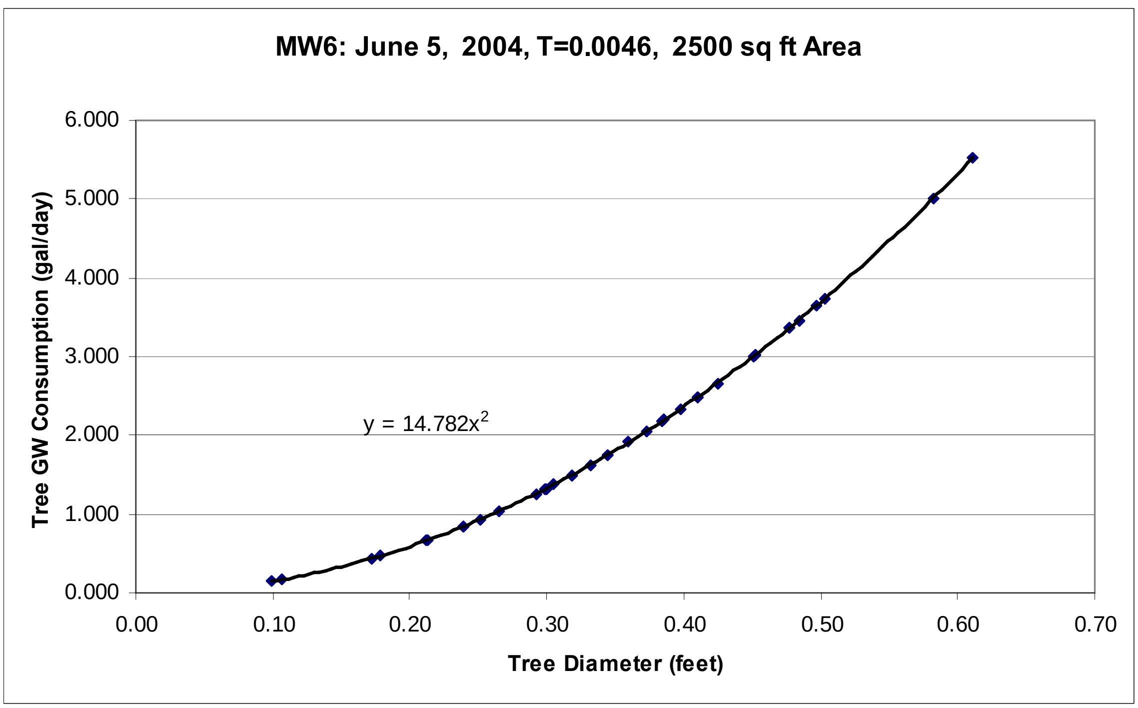

Figure E 26 MW6, June 5, 2004, 2500 ft^2

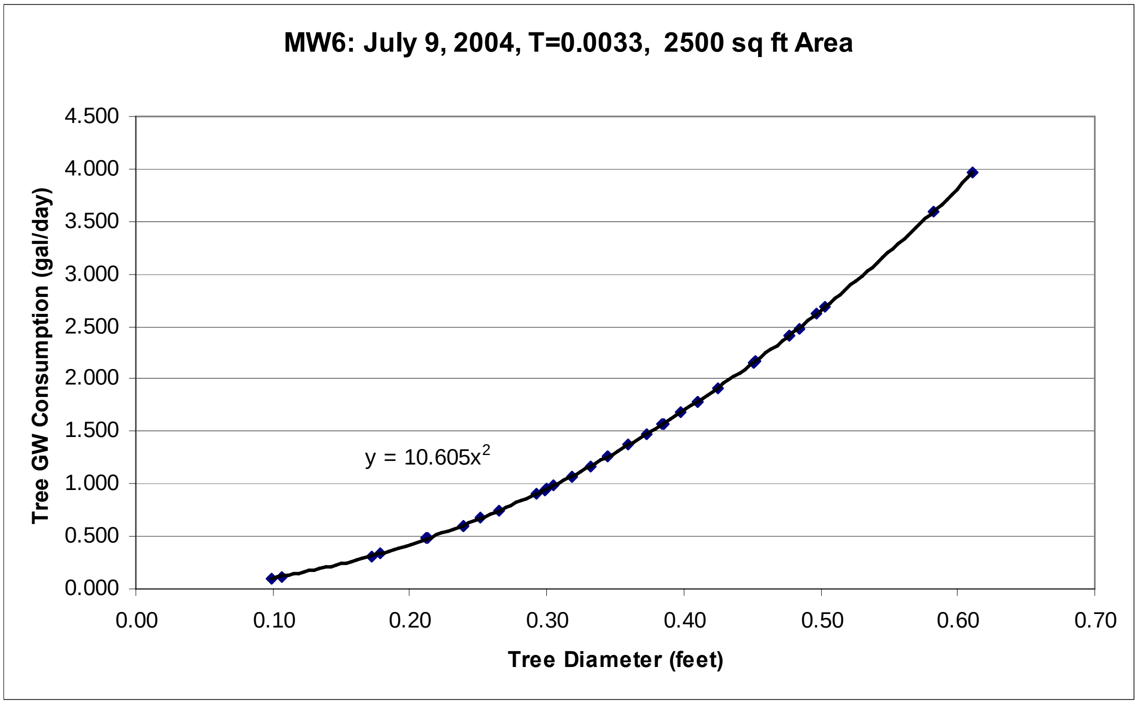

Figure E 27 MW6, July 9, 2004, 2500 ft^2

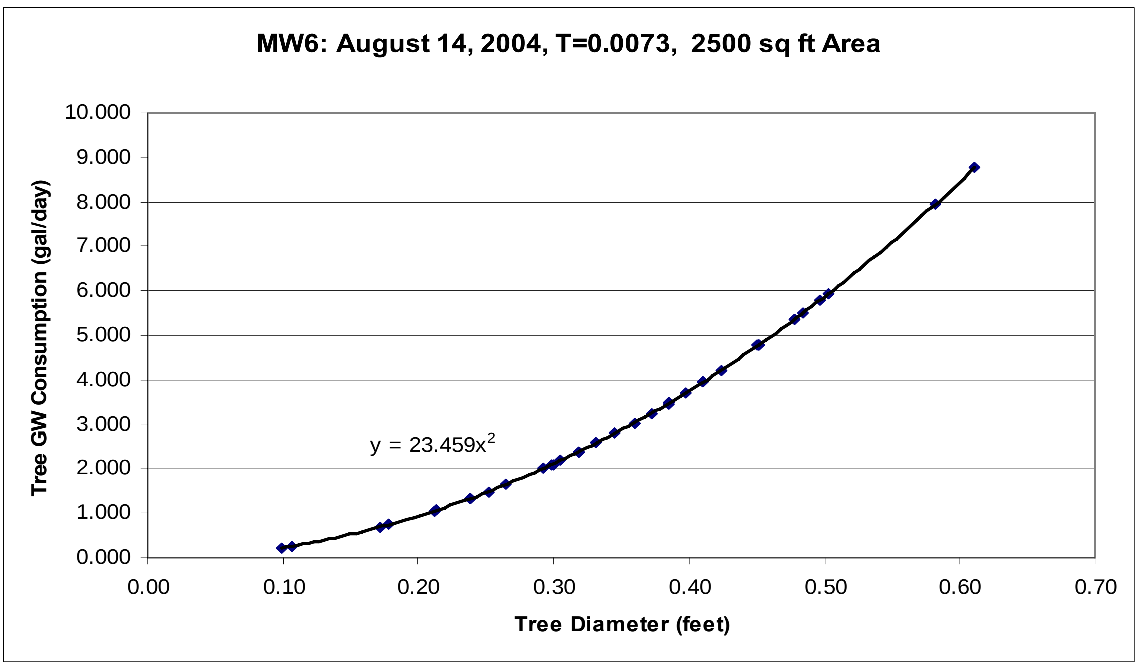

Figure E 28 MW6, August 14, 2004, 2500 ft^2

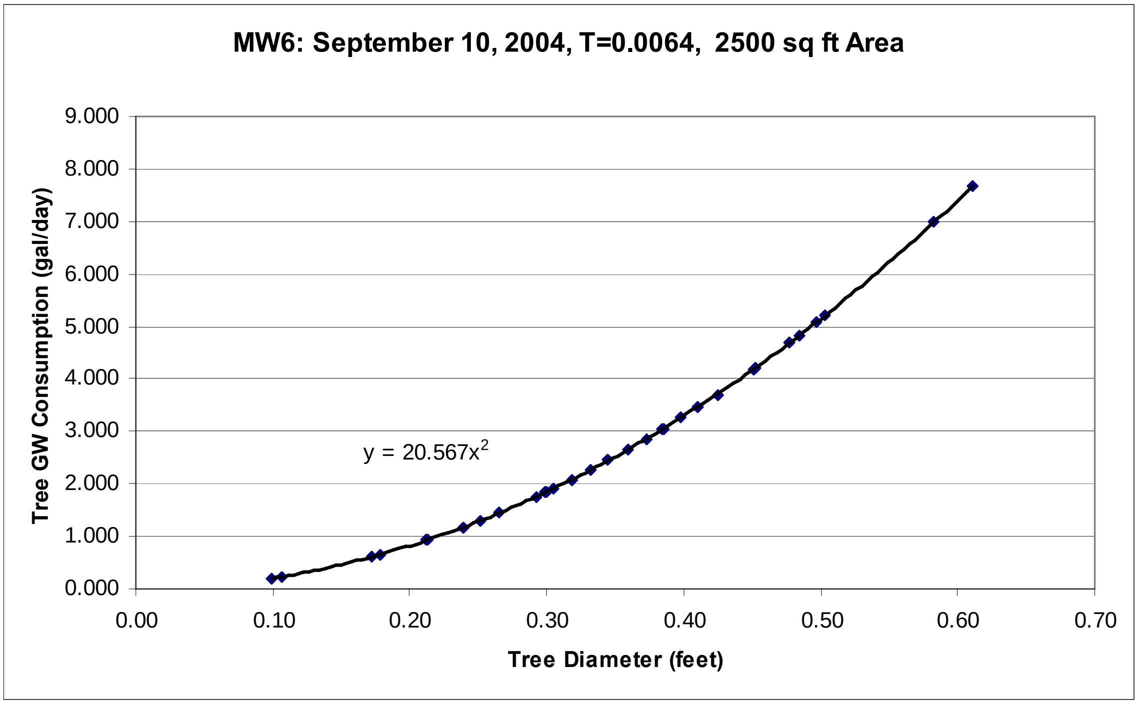

Figure E 29 MW6, September 10, 2004, 2500 ft^2

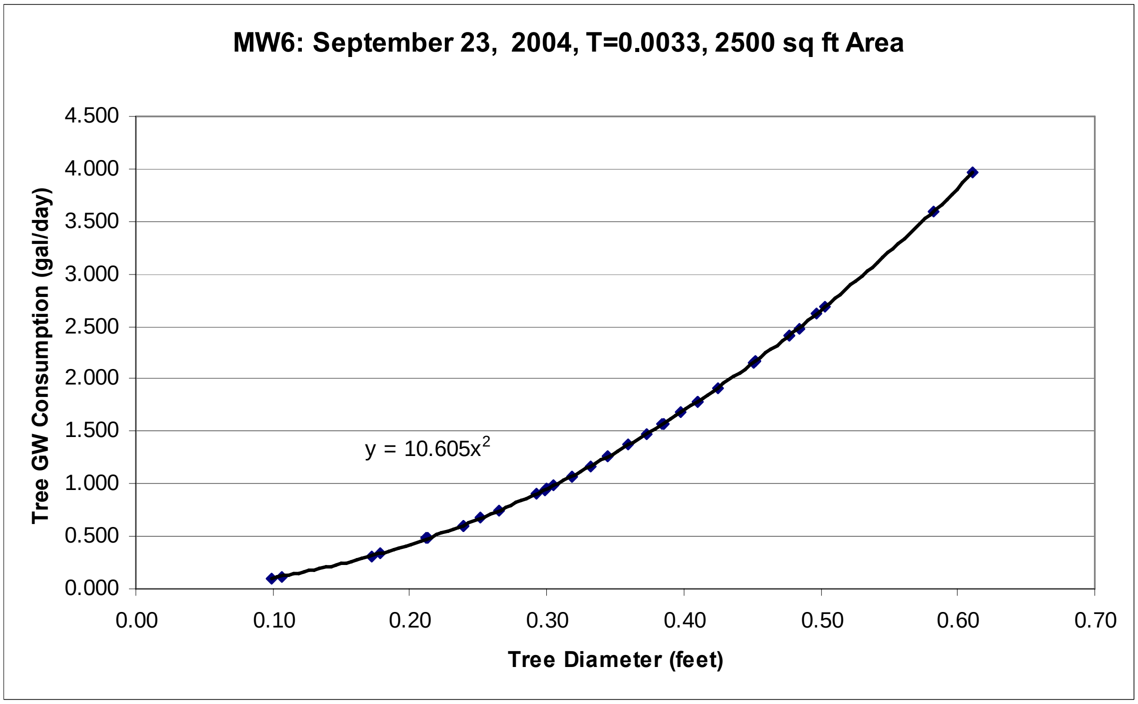

Figure E 30 MW6, September 23, 2004, 2500 ft^2

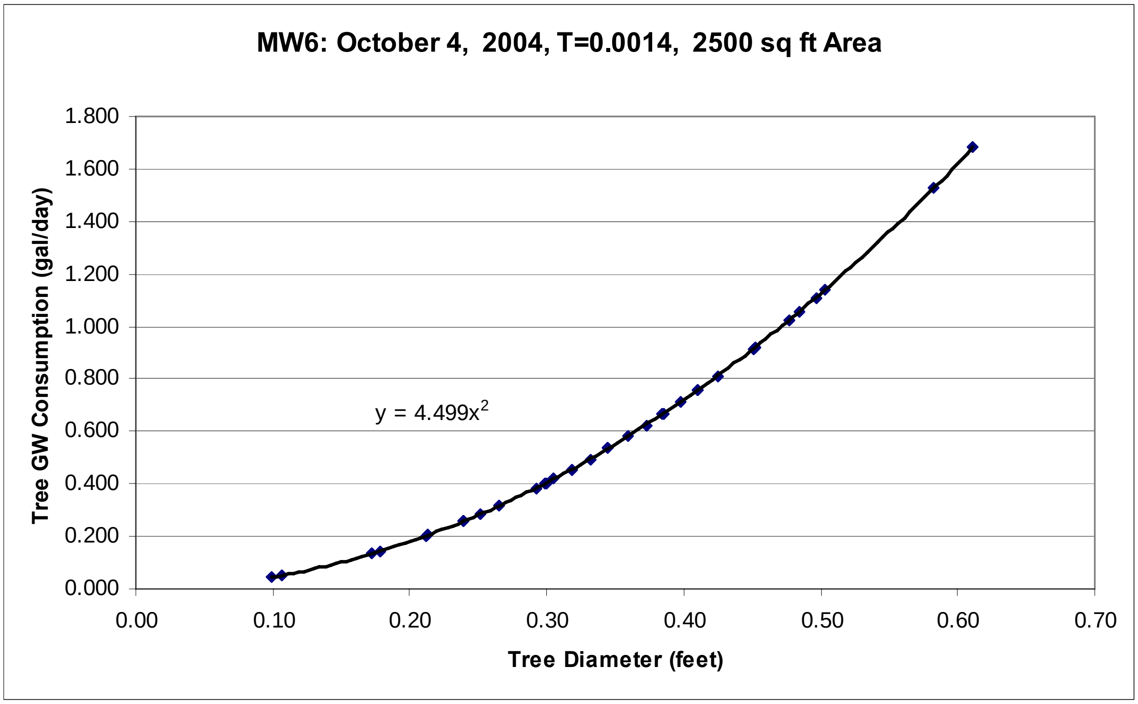

Figure E 31 MW6, October 4, 2004, 2500 ft^2

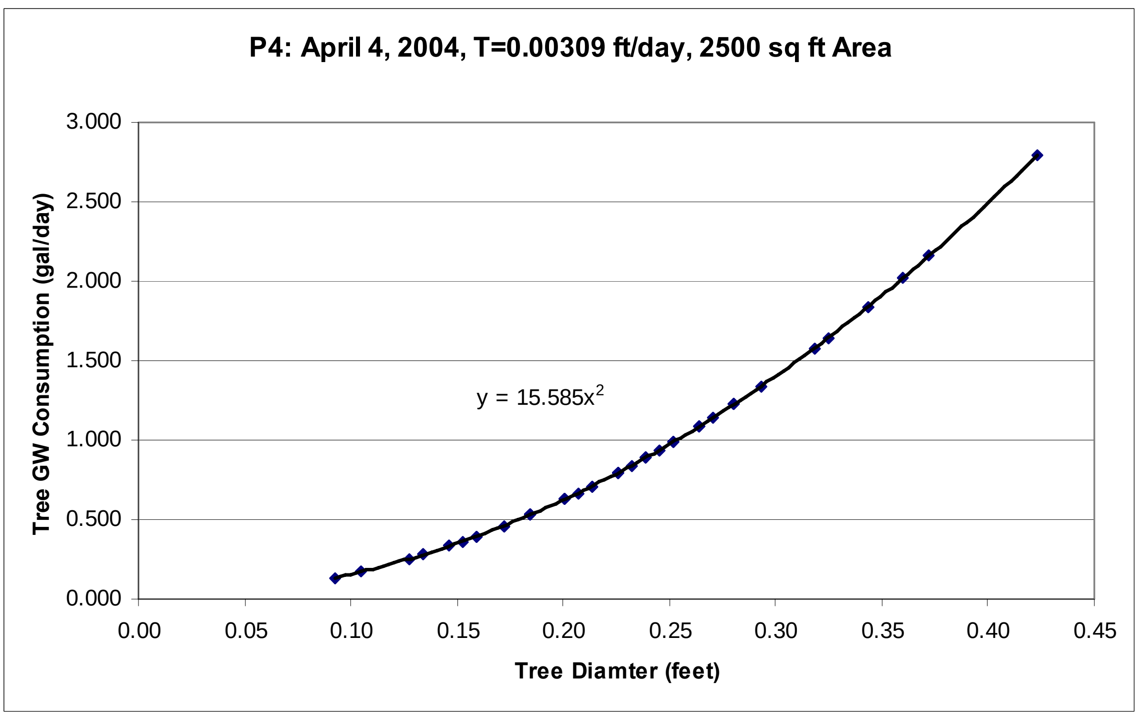

Figure E 32 P4, April 4, 2004, 2500 ft^2

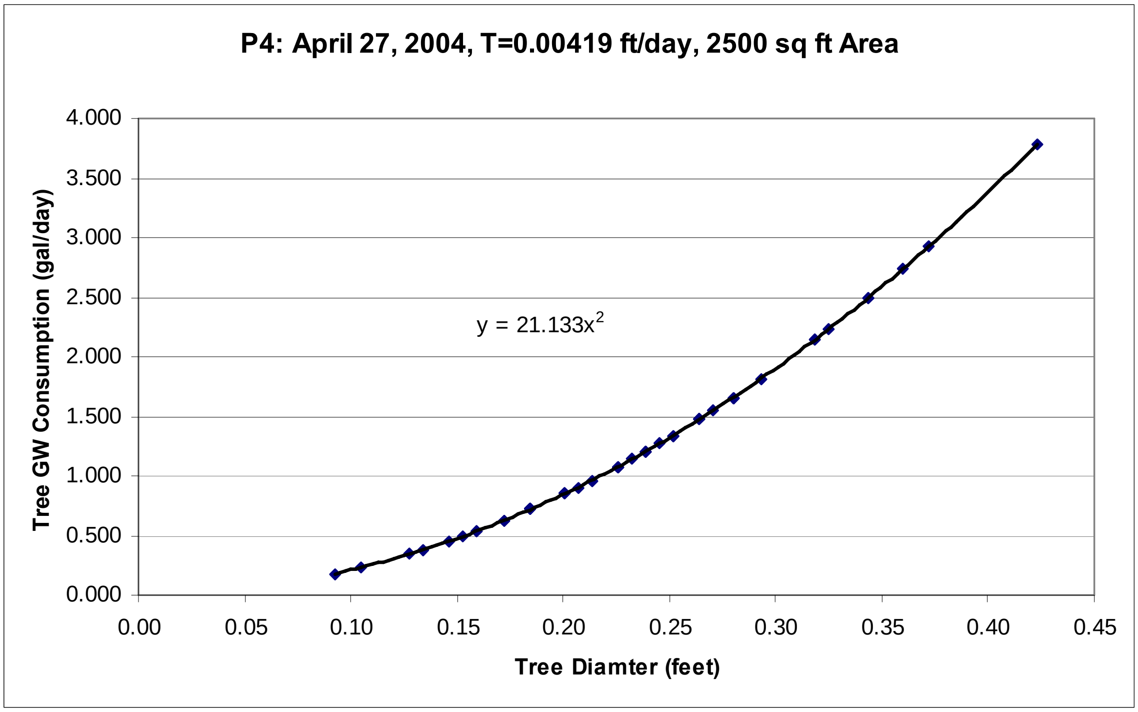

Figure E 33 P4, April 27, 2004, 2500 ft^2

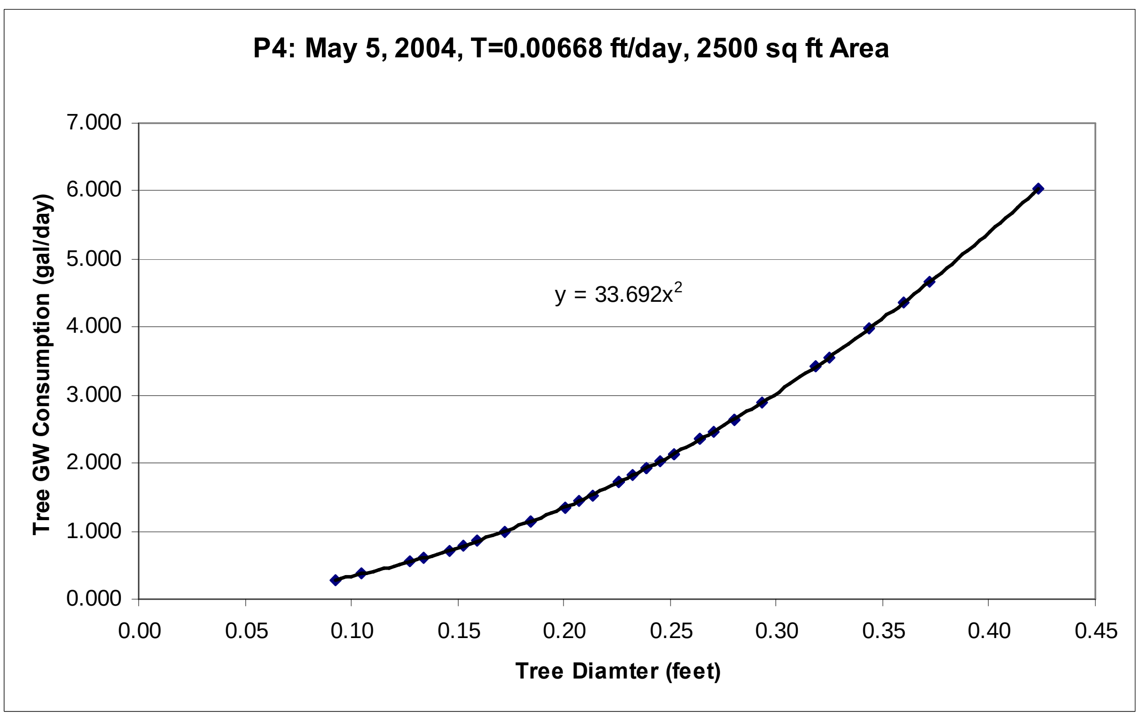

Figure E 34 P4, May 5, 2004, 2500 ft^2

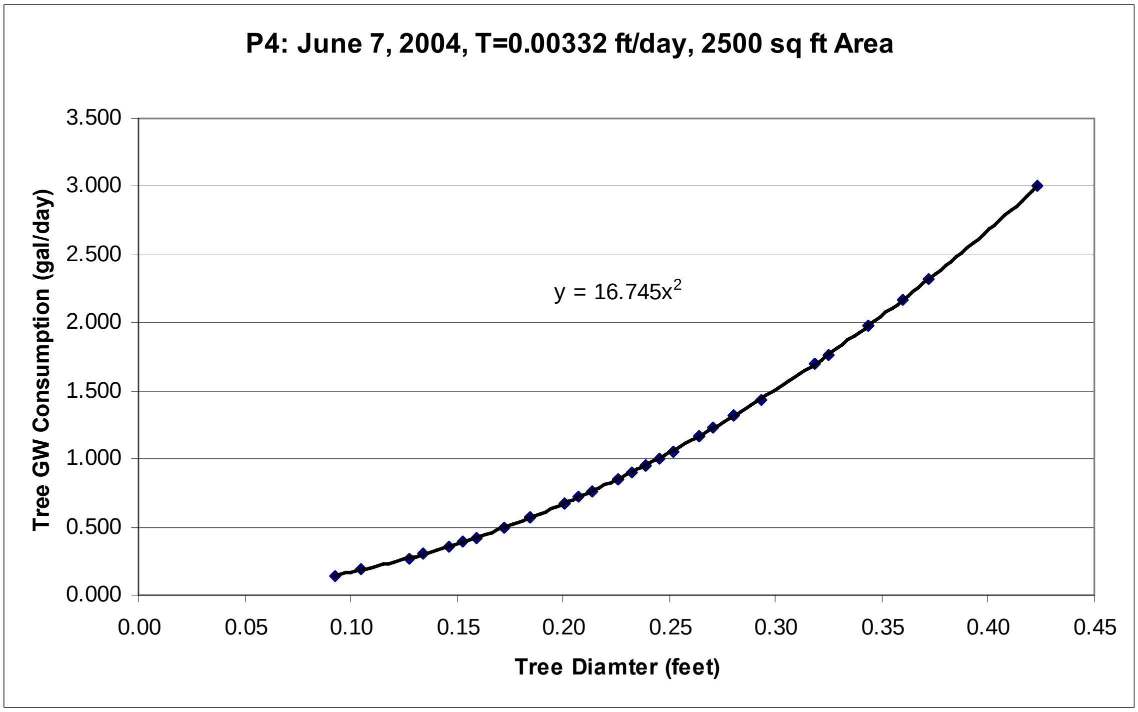

Figure E 35 P4 June 7, 2004, 2500 ft^2

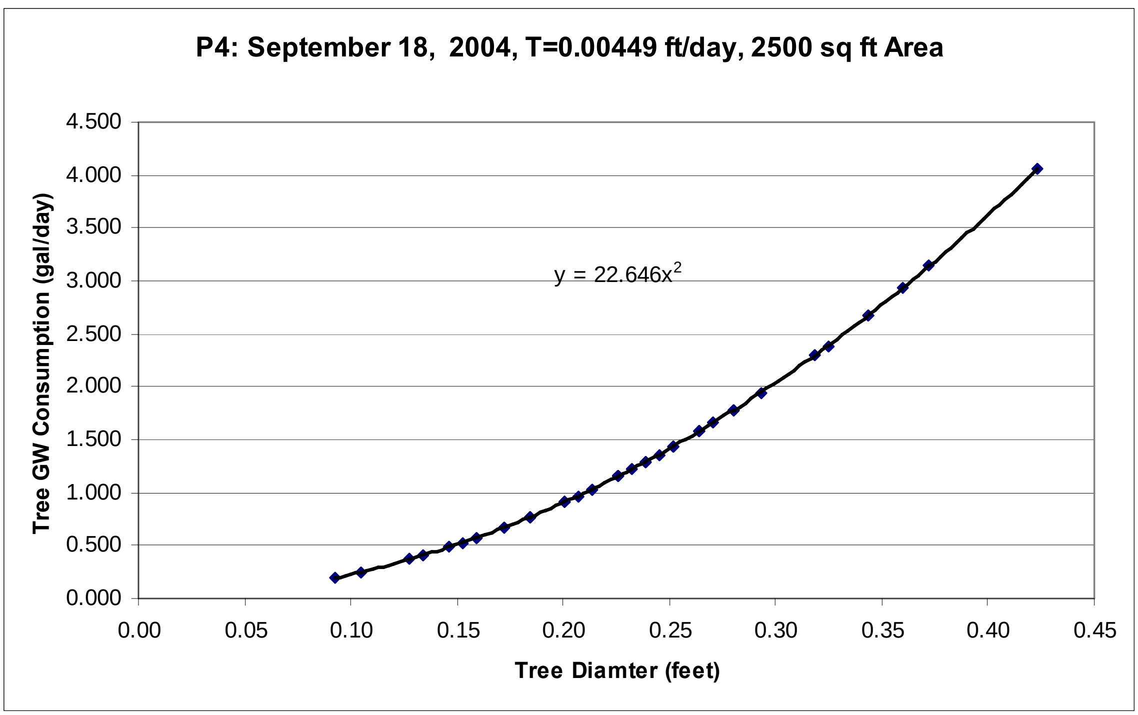

Figure E 36 P4, September 18, 2004, 2500 ft^2

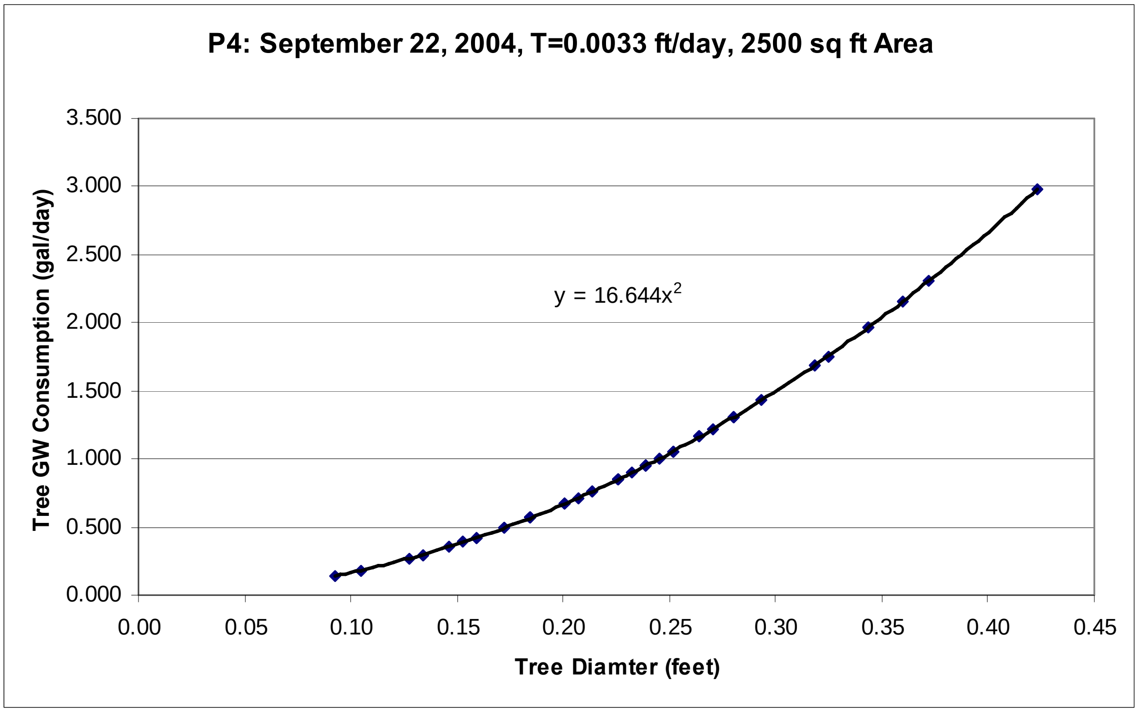

Figure E 37 P4 September 22, 2004, 2500 ft^2

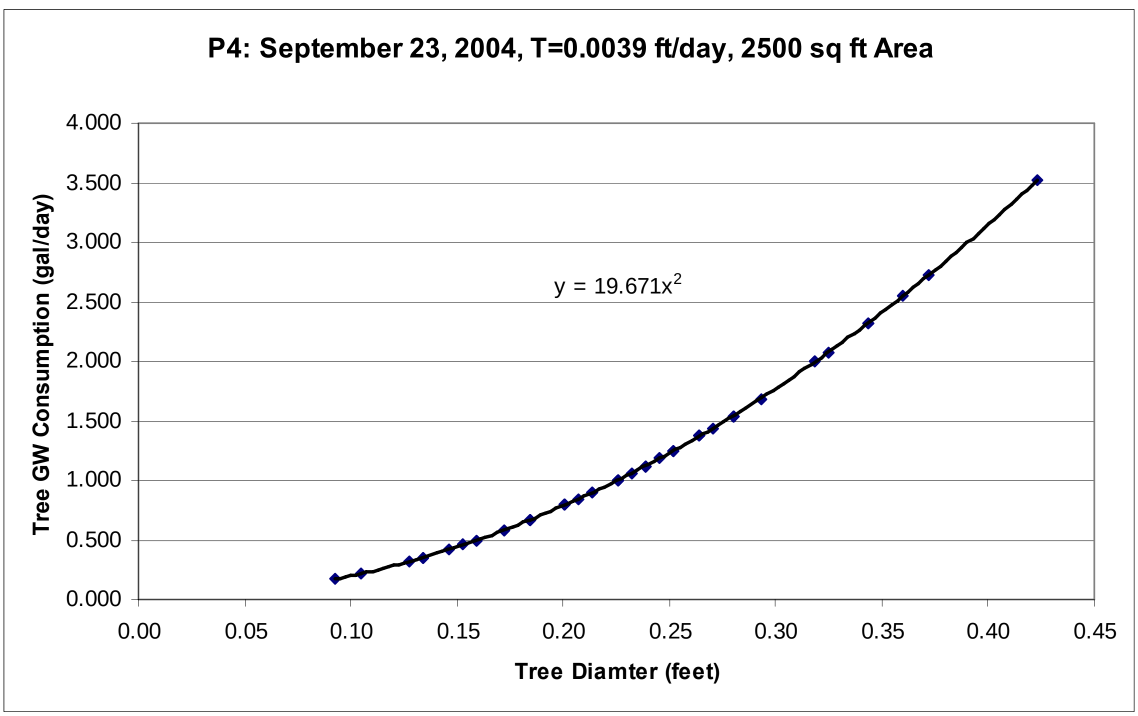

Figure E 38 P4, September 23, 2004, 2500 ft^2

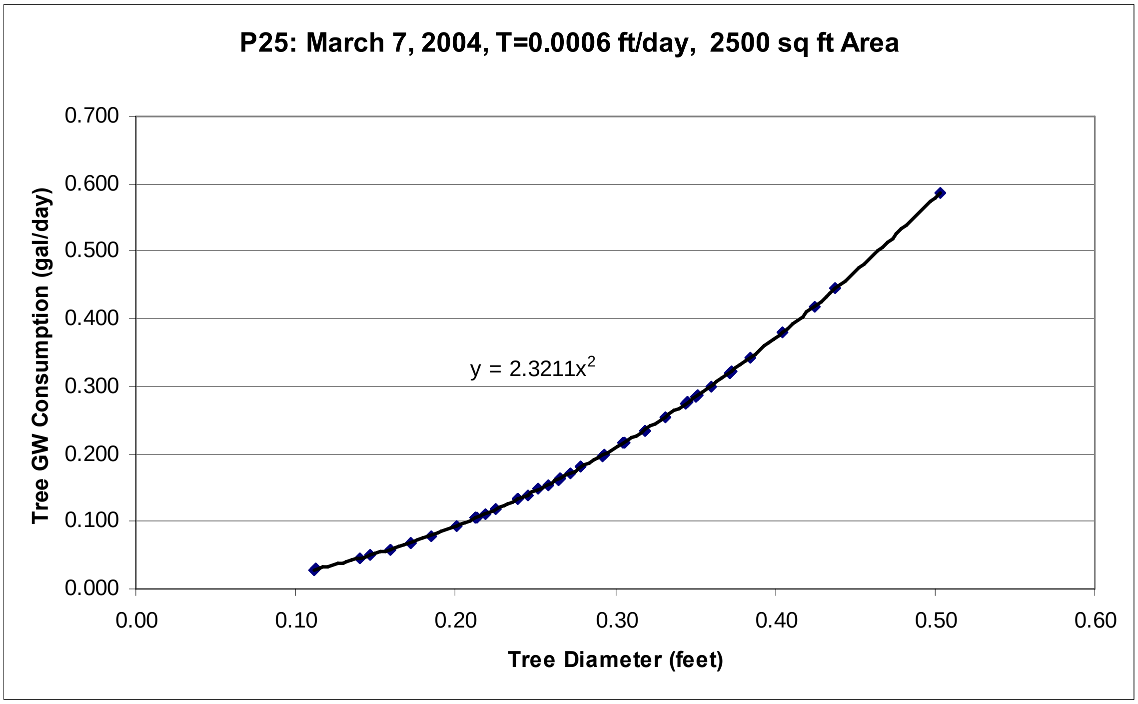

Figure E 39 P25, March 7, 2004, 2500 ft^2

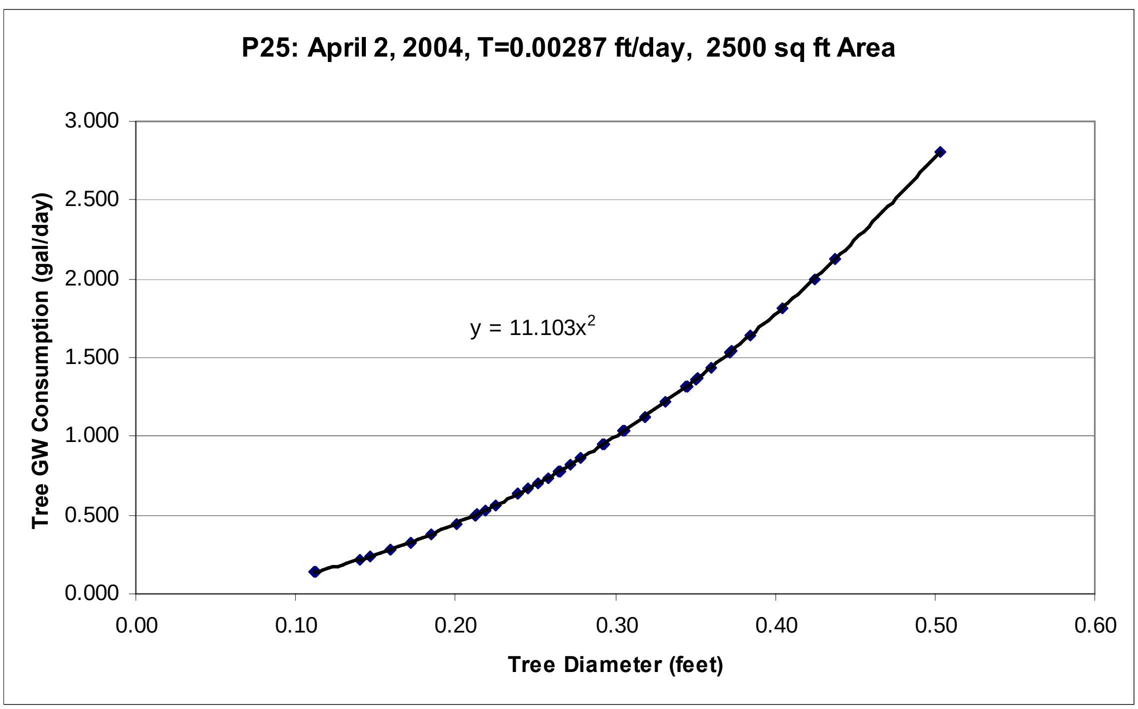

Figure E 40 P25, April 2, 2004, 2500 ft^2

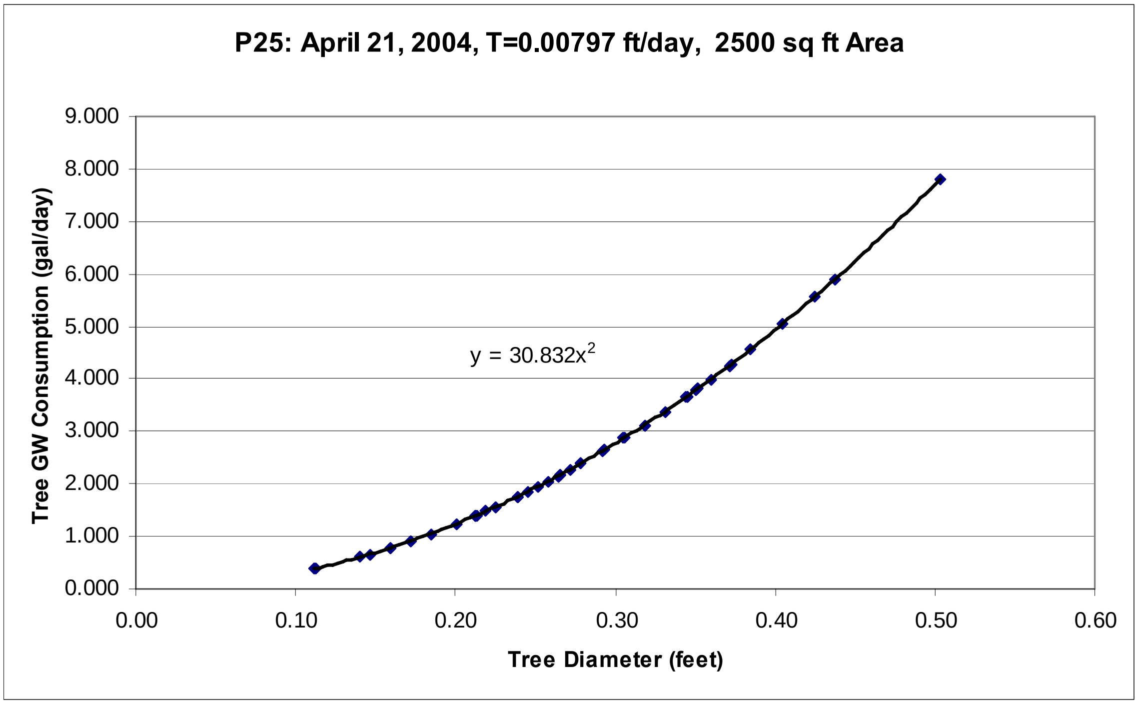

Figure E 41 P25, April 21, 2004, 2500 ft^2

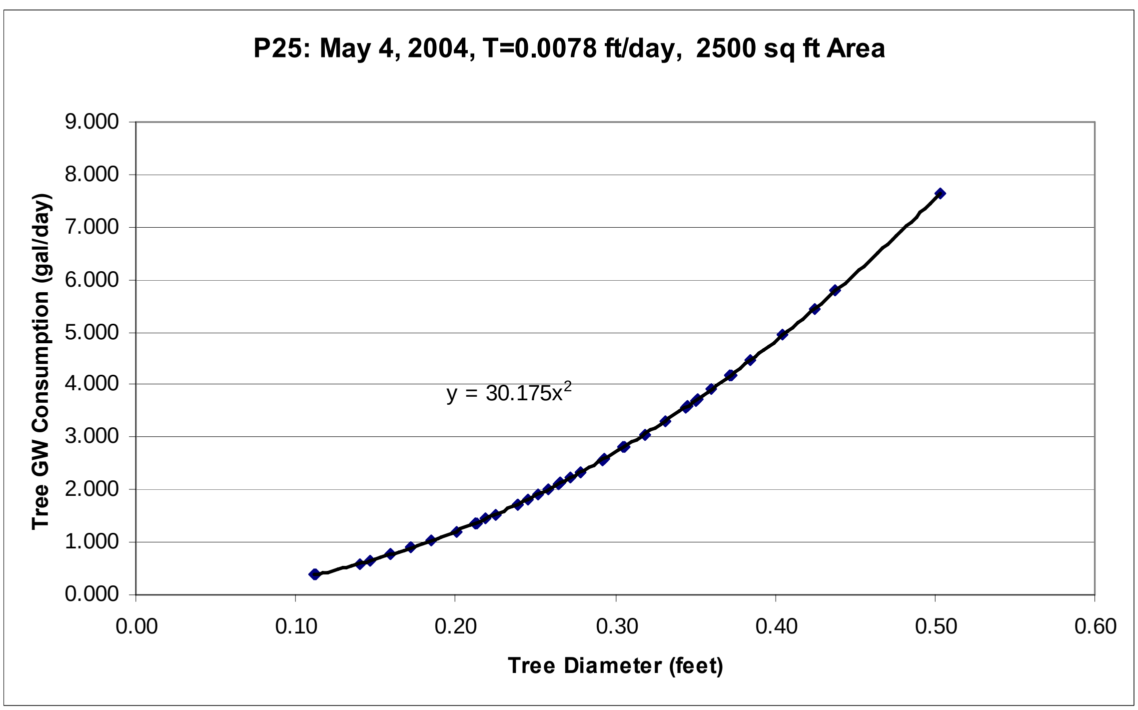

Figure E 42 P25, May 4, 2004, 2500 ft^2

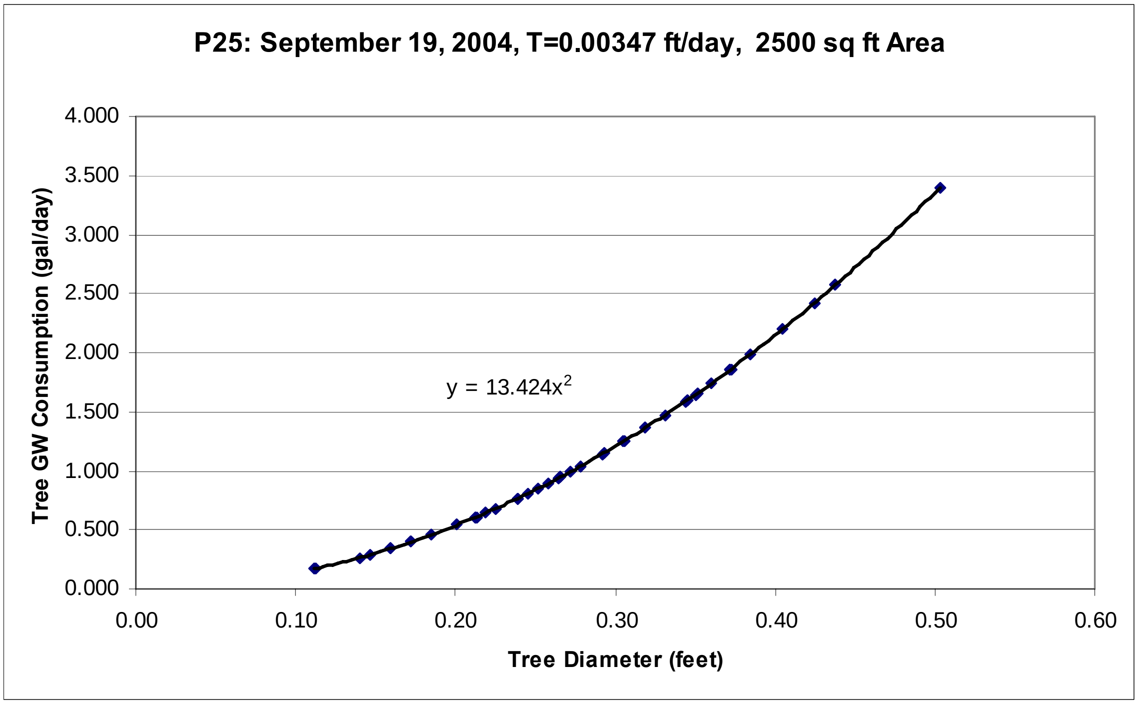

Figure E 43 P25, September 19, 2004, 2500 ft^2

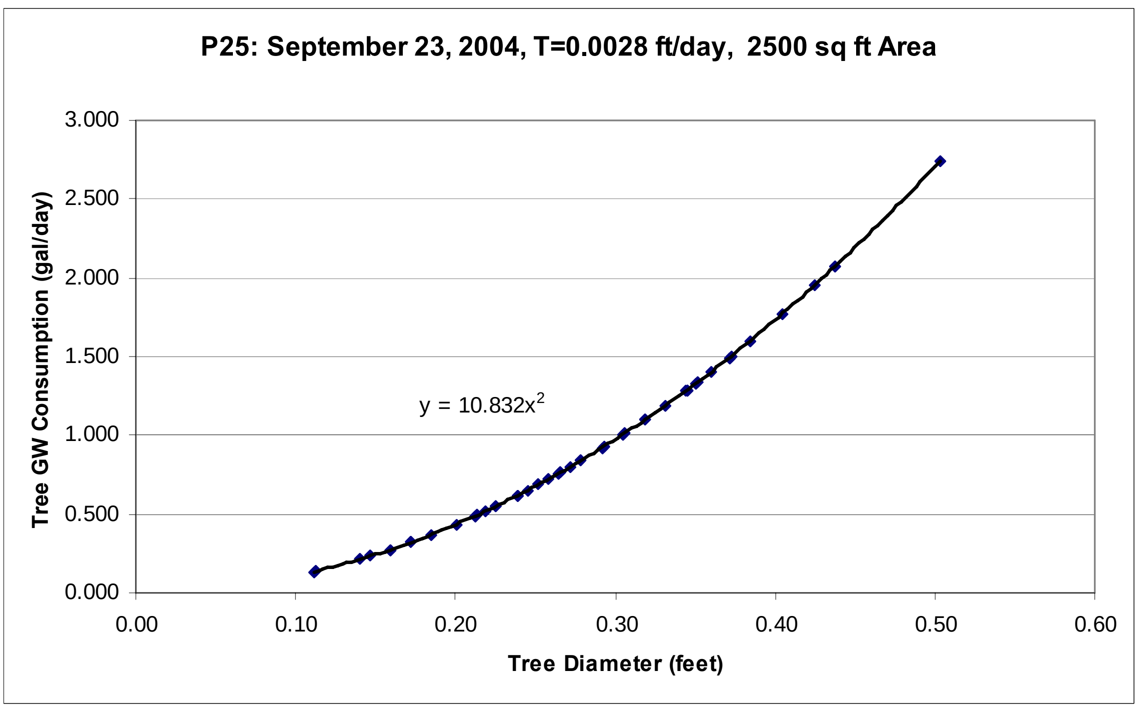

Figure E 44 P25, September 23, 2004