Irrigating Young Trees

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Irrigating young trees in the first few years of orchard establishment is a critical practice. The goal is to maximize tree growth and root expansion without stressing the trees or waterlogging the root system. Since the roots are constantly growing, it is difficult to know just where and how much water should be applied.

Using the weighing lysimeter at the Kearney Agricultural Center, we have obtained young tree water use values over a three year period. These data were used to develop the numbers shown in Table 1. To apply this information to a given orchard, make a rough measurement of the 3 dimensions (height, E-W width, N-S width) of an average tree in the field. Multiply these together to give an estimate of tree volume. The table gives estimates of the amount of water used during the months of the season by trees of varying volumes. Units are in gallons per tree per week. For instance, a tree with a volume of 200 cubic feet will need 67 gallons of water each week in July.

Values within the table may need to be altered for any given orchard because of the following factors.

•Irrigation efficiency. The table assumes high efficiency since our trees were irrigated with multiple drip emitters per tree. If microsprinklers are used, there could be more soil evaporation and water applications beyond the root zone possibly requiring 10-20% more water. For most flood or furrow irrigated orchards, the application efficiency is usually very poor and more water would be required.

•Current weather conditions. Since the table is based on long term temperature averages, abnormally hot or cold spells should be taken into account.

•Soil type. On very sandy soils where water may be leaching beyond the root zone, extra water should be applied.

•Cover crops & weed growth. The values in the table were derived from trees with no weed growth. Any other plant growth in the orchard will significantly increase the water requirements.

Table 1. Water use of young trees in gallons per week.

Tree Volume (ftxftxft)	March	April	May	June	July	August	Sept.	Oct.
10	9*	13	23	30	44	34	22	9**
25	9*	14	24	36	45	35	23	10**
50	10*	16	27	40	49	38	25	11**
100	12*	19	31	45	54	43	28	13**
200	17*	26	40	57	67	54	37	18**
300	22*	33	46	63	72	59	42	23**
400	26*	40	55	74	84	69	50	28**
500	31*	48	61	82	90	76	55	33**
600	35*	54	69	93	101	86	63	38**

* In years of normal rainfall irrigation in March may not be necessary and may actually inhibit root growth.

** These values for October should only be applied in years when temperatures stay high. Once the weather starts to cool down, irrigations should be cut off to reduce the potential for root & crown diseases.