

Irrigation Water Management Plan for Fixed Solid-Set Sprinkler Irrigation System

IRRIGATION WATER MANAGEMENT PLAN

DATE:	12/05
COOPERATOR:	T.O. Dry
LOCATION:	2 miles S of Sebring, W side of 27
FIELD NUMBER:	1
CROP:	Citrus
ROOTING DEPTH:	60"
AVAILABLE WATER CAPACITY (AWC):	3.72 inches
PEAK CONSUMPTIVE USE RATE:	0.19 inches/day
IRRIGATION SYSTEM RATE:	Solid Set Sprinklers with a 60' x 60' spacing, 5/32" diameter nozzle, 96' wetted diameter and 4.72 gpm/sprinkler @ 45 psi
SPRINKLER APPLICATION RATE:	0.13 in./hr.
WATER SUPPLY:	8" diameter well
PREDOMINATE SOIL SERIES:	Lakeland fine sand
CURRENT MANAGEMENT PRACTICE:	None

RECOMMENDATIONS:

The most important aspect of irrigation water management is properly evaluating and monitoring the available soil moisture for the particular crop. Tensiometers will be used for determining soil moisture and when irrigation is needed.

The system is designed to provide irrigation water to meet peak consumptive use for citrus in field 1 provided the acreage grown is not increased beyond 20 acres.

Moisture should always be available above the Management Allowable Depletion (MAD) for the planned crops. The critical periods for adequate available water are from fruit set (February – March) until such time when young fruit has reached more than 1-inch in diameter (June – July). The soil moisture should be checked to determine how much irrigation water should be applied for each irrigation. If operated properly, irrigation can result in high crop production. The system should be managed to maintain a high moisture level in the root zone.

Observations of the leaf wilt, soil, tensiometer readings and weather conditions will indicate when irrigation is needed to maintain the desired moisture level. The Irrigation Scheduling Guide, Table 2, was developed with the Florida NRCS computer workbook IWM and indicates the approximate irrigation frequency. The estimated irrigation frequency is from 2 to 10 days. The estimated delay days for 1/4 inch of rainfall is 1 to 6 days. The Irrigation Scheduling Guide is based on general climatic and crop data providing a beginning schedule until adjustments are made. The actual need for irrigation will be determined by observing the soil and estimating the remaining moisture (tensiometers), observing leaf wilt, and weather conditions.

Generally, during the bloom and fruit set period, irrigation will be applied when the six-inch tensiometers reach 15 cb. During the remainder of the year, irrigation will be applied at 20 cb. These guidelines may be adjusted due to variations in the soil. The tensiometer readings will be confirmed and the irrigation schedule in Table 1 adjusted by close observations described above.

The approximate number of hours to operate the system for water to reach the depth of the root system is shown on Table 1 Irrigation Scheduling Guide. The schedule will be modified based on observations of the soil. A tensiometer will be used to determine the depth the water reaches in the soil.

The operating time that is shown in the Irrigation Scheduling Guide will be modified by using a tensiometer in the lower portion of the root system. An 18-inch tensiometer will be used. Operating time will be decreased if the 18-inch tensiometer drops below 10 cb and increased if readings rise above 15 cb during the bloom and fruit set period. During the remainder of the year, operating time will be decreased if the 18-inch tensiometer drops below 10 cb and increased if it rises above 20 cb. These guidelines may be adjusted for the soil type based on observations.

Based on the current uniformity and discharge rate, to replace 30% of the soil moisture to a depth of 60 inches, 11 hours, 45 minutes of irrigation are required. To replace 50% of the soil moisture to a depth of 60 inches, 19 hours, 45 minutes of irrigation are required. These estimates are to be confirmed or modified, based on observations of the soil.

The irrigation system should be checked periodically to ensure proper operation of the pump, pipeline, and sprinklers. Some puddling may occur during system operation. If significant puddling, runoff, or other irrigation-induced erosion occurs, the system should be operated for a shorter duration and the frequency of irrigation increased.

Check the condition of the crop to ensure that it looks consistent in color to determine adequacy and uniformity of irrigation. If application is not uniform, a system evaluation should be performed.

If there is change in the soil moisture monitoring method or irrigation method, the NRCS office in Sebring, Florida, should be contacted.

Table 1 - Irrigation Scheduling Guide

	---Irrigation---					---Rainfall---
	^{1/} MAD	^{1/} MAD	^{2/} Gross Irrigation Depth	^{3/} Operating Time	Irrigation Interval	Delay Days per 1/4 inch of rainfall
<u>Month</u>	(%)	Inches	Inches	Hrs: Min	Days	
January	30	1.12	1.48	11:45	20	4
February	30	1.12	1.48	11:45	17	4
March	30	1.12	1.48	11:45	13	3
April	30	1.12	1.48	11:45	11	2
May	30	1.12	1.48	11:45	8	2
June	30	1.12	1.48	11:45	7	2
July	50	1.86	2.49	19:45	12	2
August	50	1.86	2.49	19:45	12	2
September	50	1.86	2.49	19:45	14	2
October	50	1.86	2.49	19:45	18	2
November	50	1.86	2.49	19:45	24	3
December	50	1.86	2.49	19:45	32	4

^{1/} Management Allowable Depletion.

^{2/} Application depth necessary to replace water used by crop assuming an application efficiency of 75%.

^{3/} Time required for each irrigation unit.