

Westlands Water District

**WATER
MANAGEMENT
HANDBOOK**

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Overview

Irrigation is both an art and a science. Science has provided many concepts and methods for measurement of the various processes involved in irrigation. However, your knowledge of your field and crop, along with your experience in applying this science to them, will remain of utmost importance in achieving effective, efficient irrigations.

EFFECTIVE irrigations produce the desired crop response.

EFFICIENT irrigations make the best use of available water. Irrigation efficiency does no good if it is not effective in producing a profitable crop. But increasing pressures on agriculture water supplies and legitimate concerns for water quality require that we be as efficient as possible.

Effective, efficient irrigations are the result of knowing WHEN to irrigate, HOW MUCH to irrigate, and HOW to irrigate.

WHEN to irrigate is an agronomic decision, based on how you want the crop to develop.

HOW MUCH to irrigate is the soil moisture deficit in the effective root zone. You must know how much water is needed to take the soil back to field capacity.

HOW to irrigate is not just knowing how to set a siphon tube or hook up a sprinkler pump. Knowing HOW to irrigate is knowing how to apply water evenly (a high distribution uniformity) with control of the total application (a high irrigation efficiency).

This handbook is not meant to be a rigorous, scientific explanation of physical processes. For example, you will see descriptions of how soil "holds" water, and the limits to this ability, field capacity, and permanent wilting point. Soil actually never retains an absolute amount of water. There is always internal drainage, however slow. And the actual measurements of field capacity and permanent wilting point will change with the soil condition, temperature, plant, and growth stage.

However, for the normal, everyday purposes of modern agricultural water management, the concepts you will see have been accepted and used quite successfully for many years.

In the past, scientists have been very successful in formulating recommendations for the fertilizer program. Modern managers utilize soil and plant analyses to plan what fertilizer, in what form, is to be applied by what method. "Numbers" have been put on the fertilizer program.

"Numbers" have also been put on the weed/pest control programs. Now growers think in terms of economic thresholds. Applicators have to follow label requirements exactly to ensure efficient and safe use of chemicals.

This handbook will help you to "put numbers" on the irrigation program.

This Handbook is an ongoing and evolving project and, as such, will be implemented in a progressive manner. The information presented here is intended to be of specific interest to water users in the District, but links will be provided to other resources on the Internet that may be of value. Peter Canessa, PE, has contributed significantly to the materials presented in this handbook.