

Section 21 of 22 (21I - Using Irrigation Water Efficiently)

1. Any water applied above that needed to grow a crop is inefficient use of water. Water needed to grow a crop includes the following:

Evapotranspiration (ET) – Water evaporated from the soil and plant surfaces and transpired from vegetation (Also known as Consumptive Use CU), and

Leaching Requirement – The amount of water required to pass through the root zone to reduce salt concentration or prevent salt accumulation in the root zone and sustain or improve production.

2. It is necessary to know efficiency in order to determine the total amount of water to apply. Efficiency is generally expressed by terms that are often used interchangeably, such as application efficiency or irrigation efficiency. They are defined as follows:

Application Efficiency (E_a or AE) – The ratio of the average depth of water infiltrated and stored in the root zone to the amount of water applied. Often used to describe single irrigation events. AE is reduced by runoff, deep percolation, and evaporation.

Irrigation Efficiency (E_i) – The ratio of the average depth of irrigation water beneficially used to the average depth applied, expressed as a percentage. Generally used to express overall field or farm efficiency, or seasonal irrigation efficiency. E_i is reduced by runoff, deep percolation, and evaporation.

3. Many factors can affect efficiency to include the following:

- a. **Method of application,**
- b. **Levelness of land,**
- c. **Smoothness of land,**
- d. **Application rate,**
- e. **Soil type and condition to also include organic matter,**
- f. **System management,**
- g. **Root zone available water holding capacity at time of application, and**
- h. **Distribution Uniformity**

Applying more water than the amount needed to fill the root zone and fulfill the leaching requirement will not benefit the crop.