This presentation premiered at WaterSmart Innovations

watersmartinnovations.com

watersmart
INNOVATIONS

The Agronomic Viability of Soil Moisture Sensors In the Landscape

Jon Peters - Baseline Inc.
jonp@baselinesystems.com
509-209-0615

Eliminating or reducing water use in the landscape is easy.

– Reduce the irrigated area

– Reduce “valve on time”

– Shut the water off…

Many water restrictions are aimed at reducing landscape water use.

Eliminating or Reducing Landscape Overwatering (watering efficiently) Is not as easy

– Proper design and installation
(Uniformity, Hydro Zones, Hydraulics, Flow Monitoring, Master Valves)

– Water only when needed (When to turn on the sprinklers)

– How much water (When to shut off the sprinklers)

Most water rebate and education programs are aimed at efficient use.

Why Soil Moisture Sensors?

– Easy to understand, (It works like a thermostat)

– Directly measuring the result is more accurate and reliable

– Capable of more than reducing water waste

– No regular maintenance, or service fees

Soil moisture content -

Saturation- The soil pores are filled with water and nearly all of the air in the soil has been displaced by water

Field Capacity- The level of soil moisture left in the soil after drainage of the gravitational water

Maximum Allowed Depletion (MAD) - Desired soil moisture deficit at the time of irrigation.

Permanent Wilt Point – The minimal point of soil moisture the plant requires

Oven Dry- When soil is dried in an oven, nearly all water is removed. This moisture content is used to provide a reference for measuring the other three soil moisture contents.

The Basic Principals of Irrigation management-

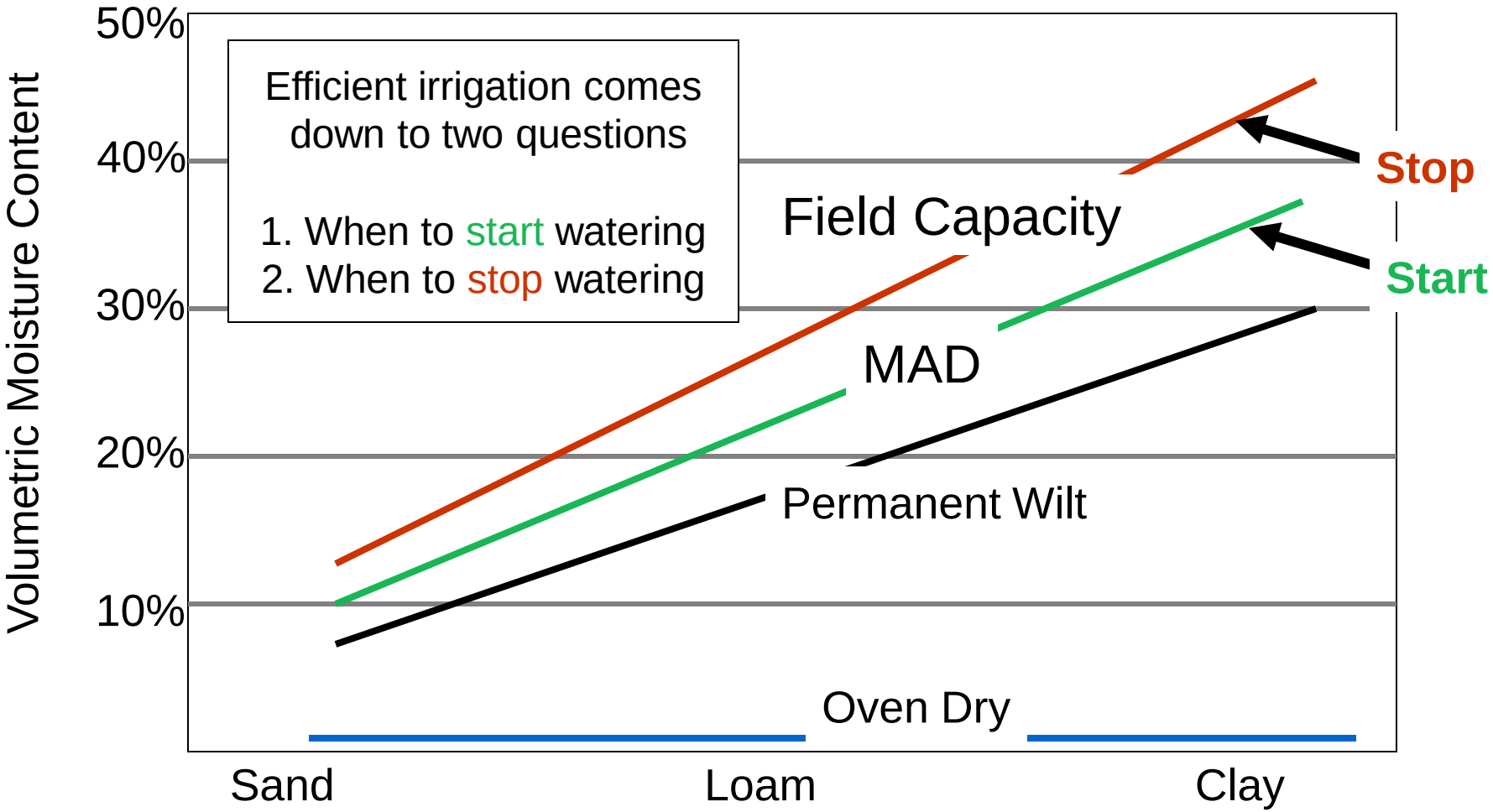
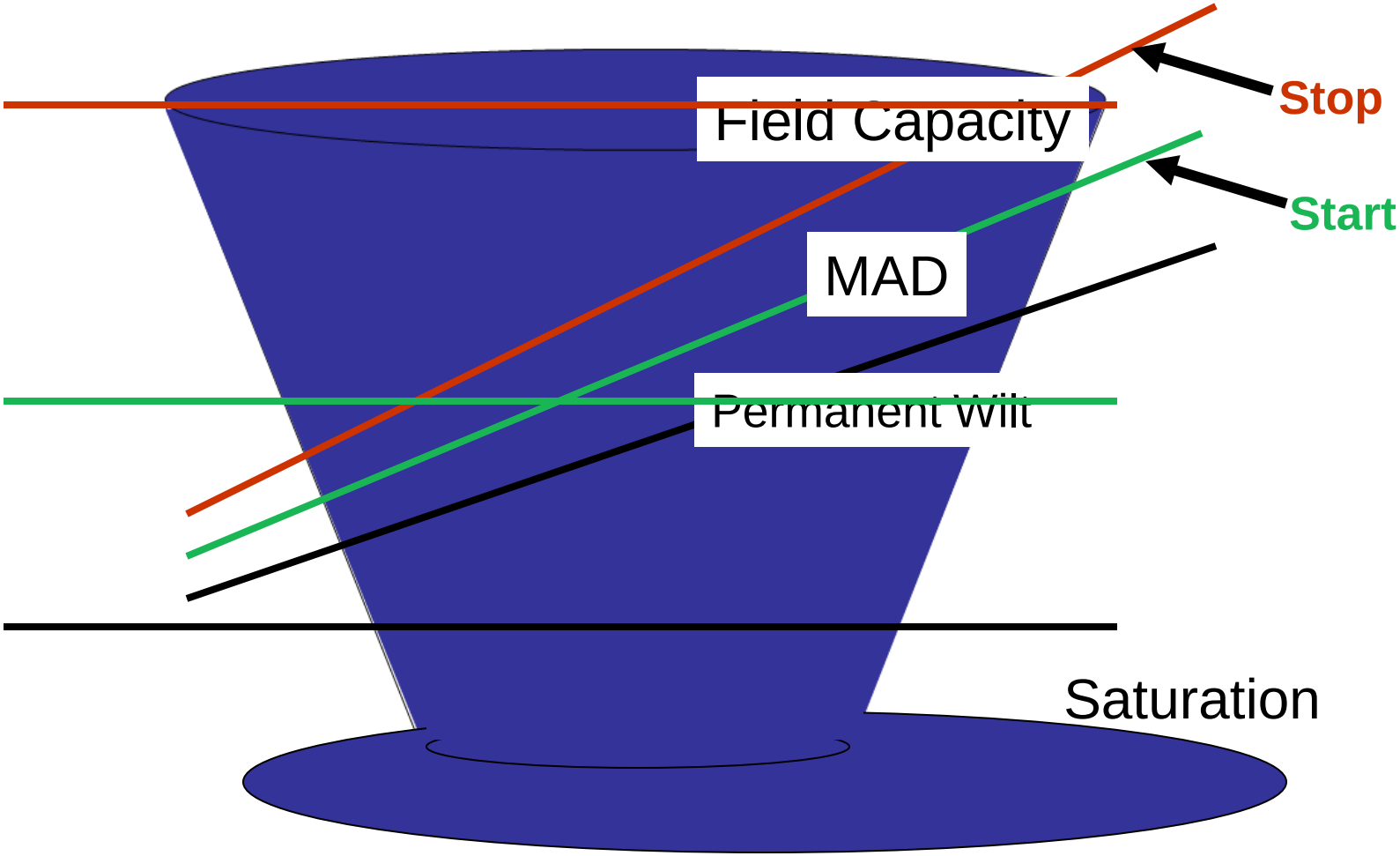
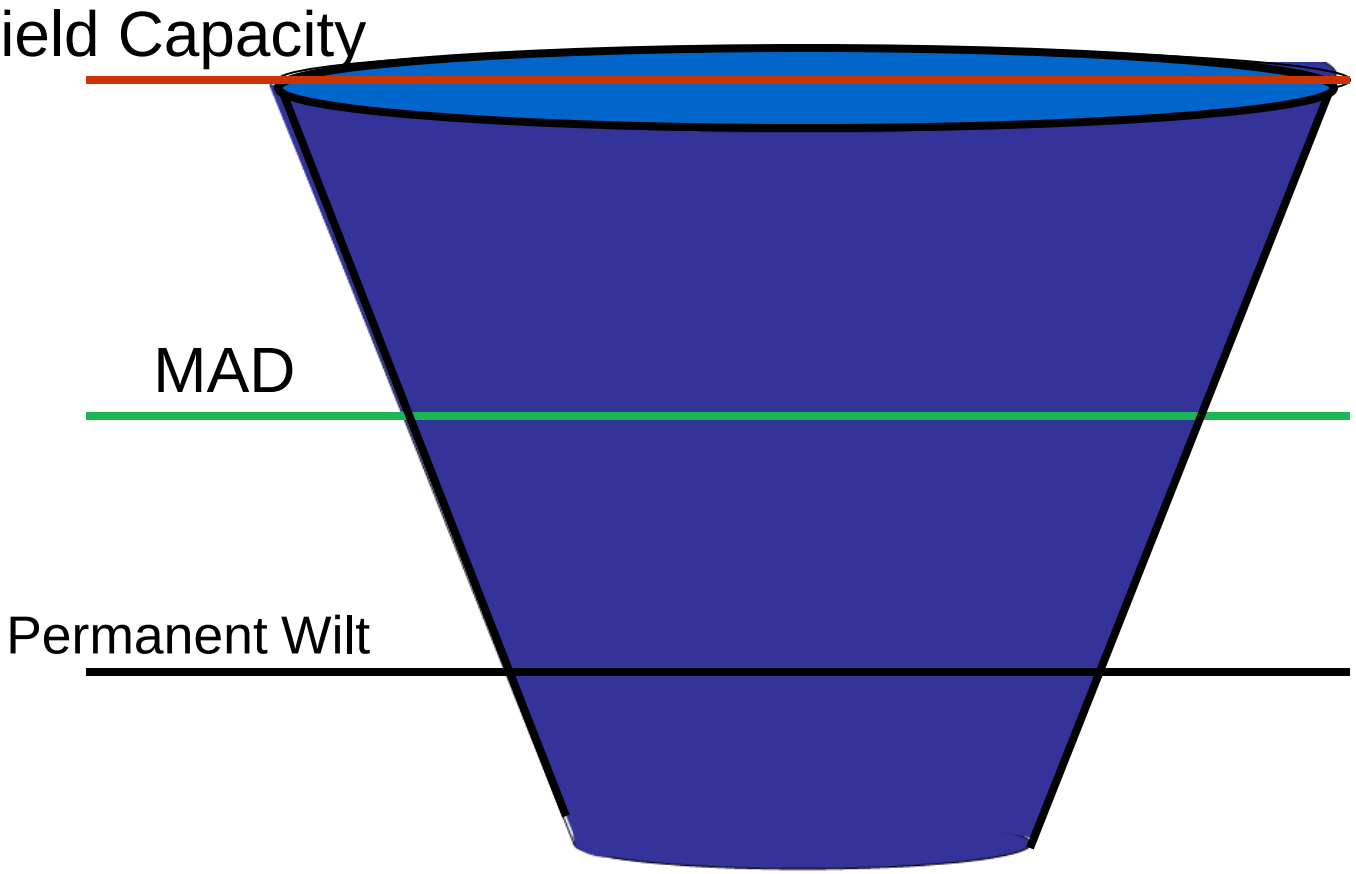


Chart for explanation purposes only

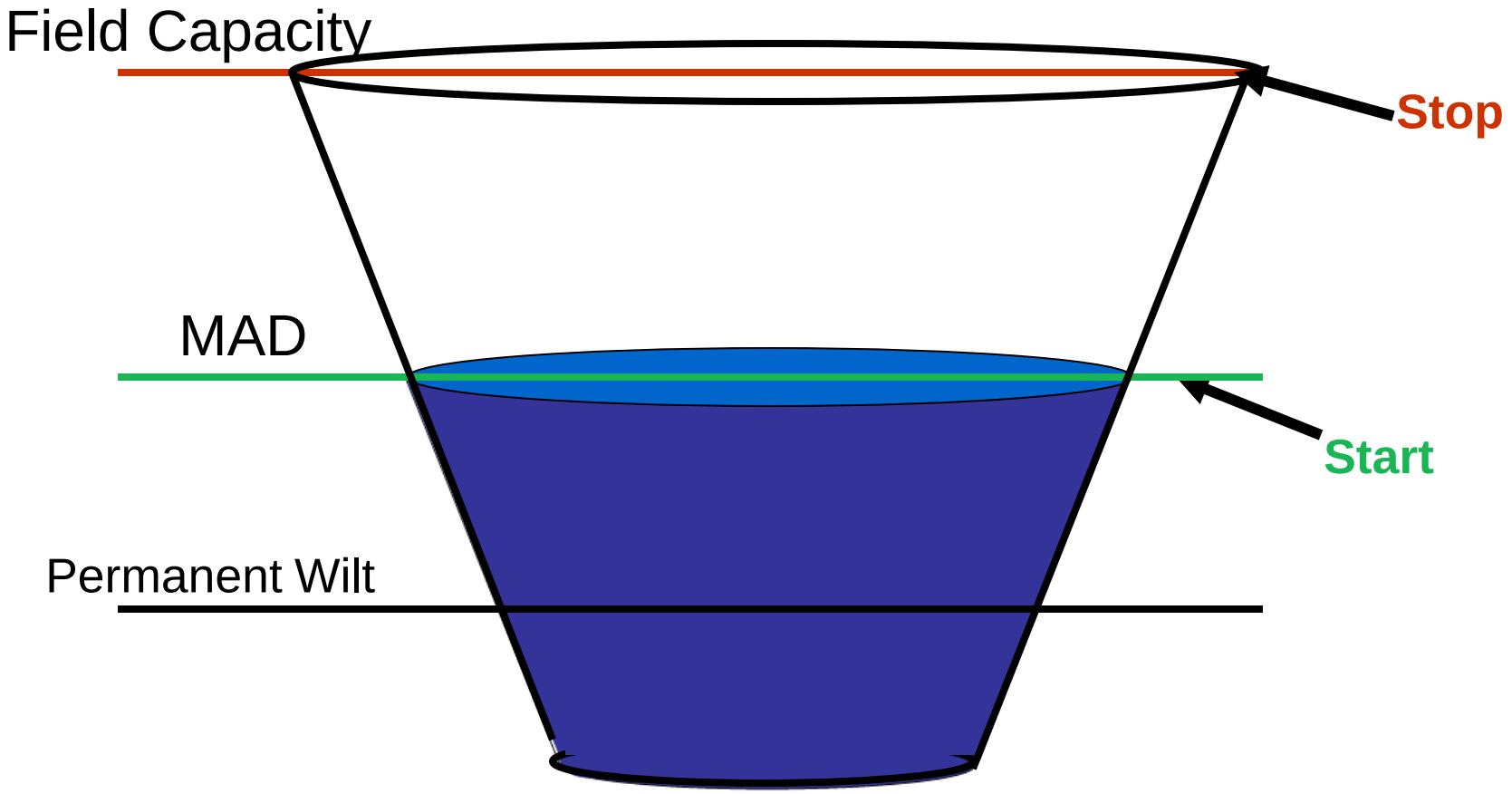
The Basic Principals of Irrigation management-



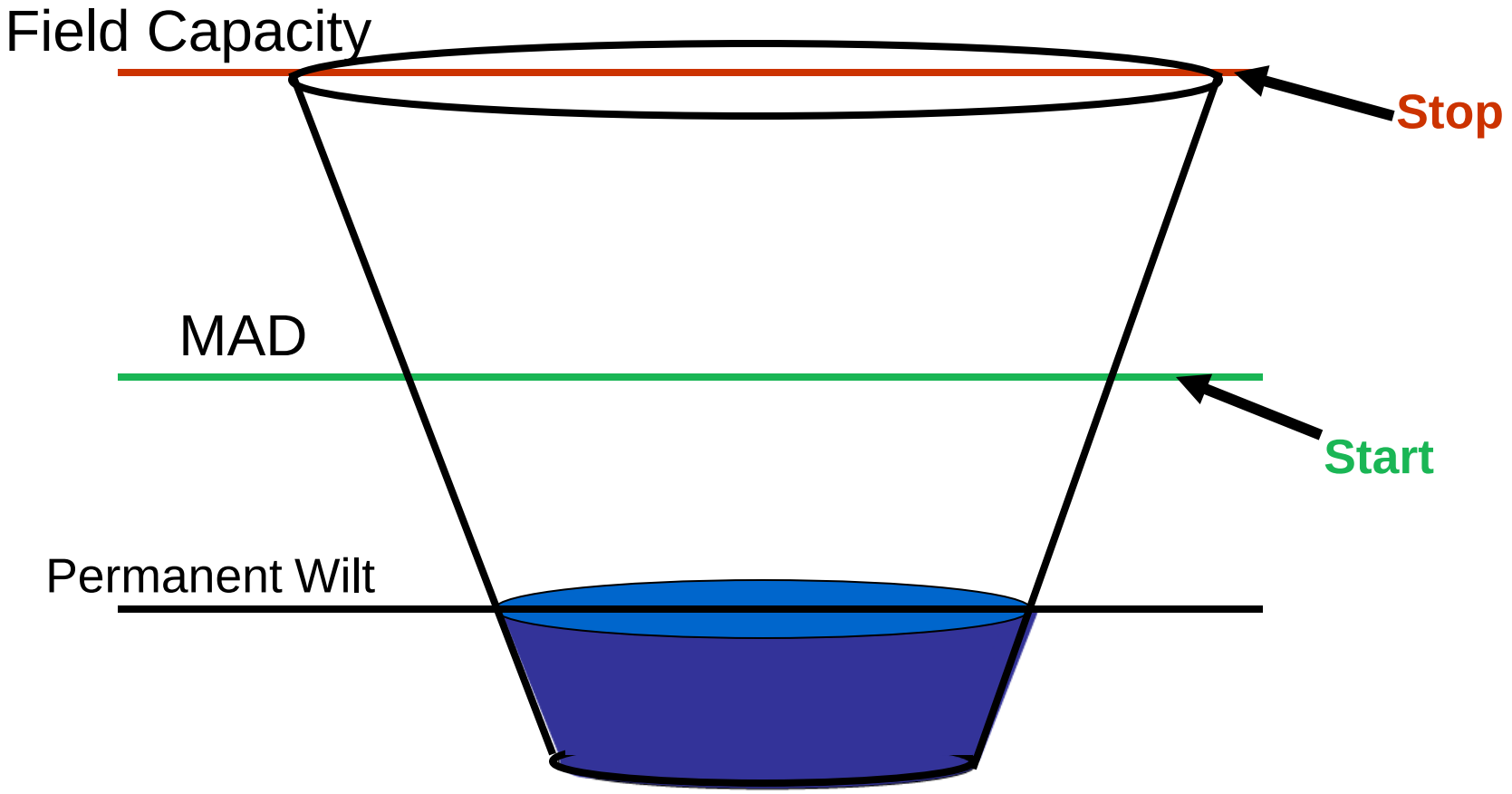
The Basic Principals of Irrigation Management-



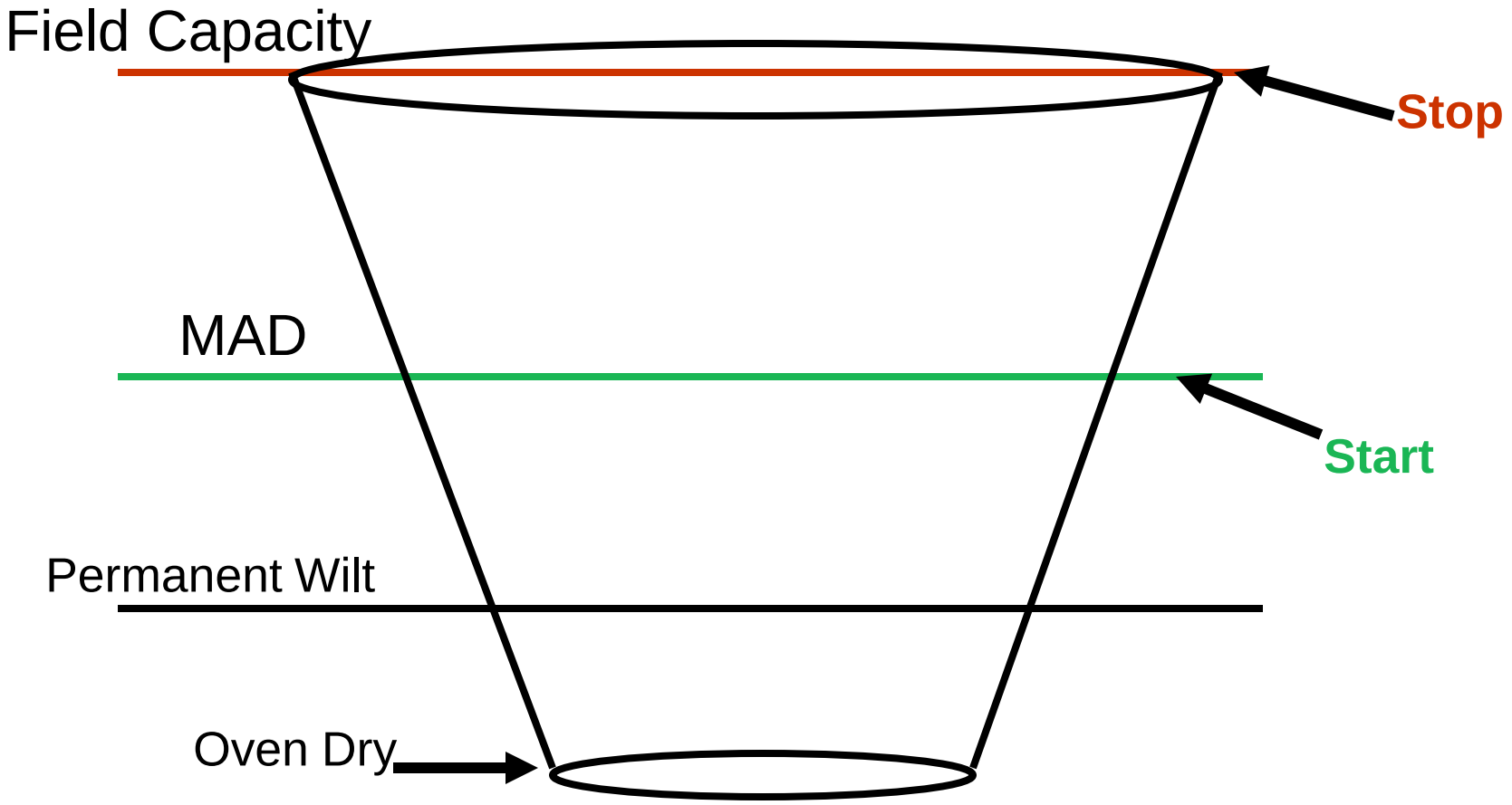
The Basic Principals of Irrigation Management-



The Basic Principals of Irrigation Management-



The Basic Principals of Irrigation Management-



The Basic Principals of Irrigation Management-
-Two Basic Watering Strategies-

Deep and Infrequent

– Optimize rooting depth (WUE)

– Can be used to deficit irrigate

– Optimize drought tolerant plant traits

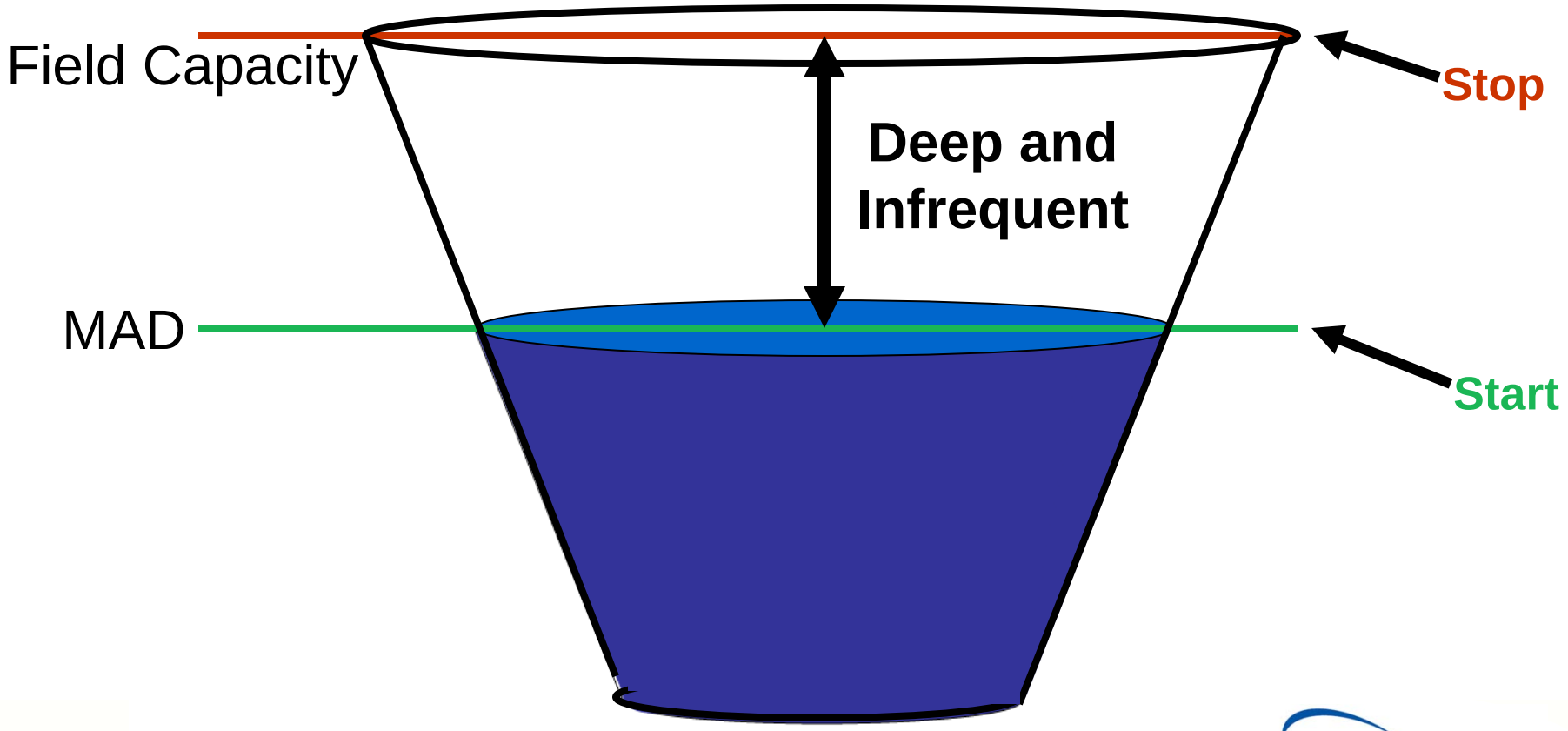
Maintain Moisture level or Schedule driven

– Manage restricted water windows, (sports fields, or municipal water restrictions)

– Maintain (often can produce a more lush appearance)

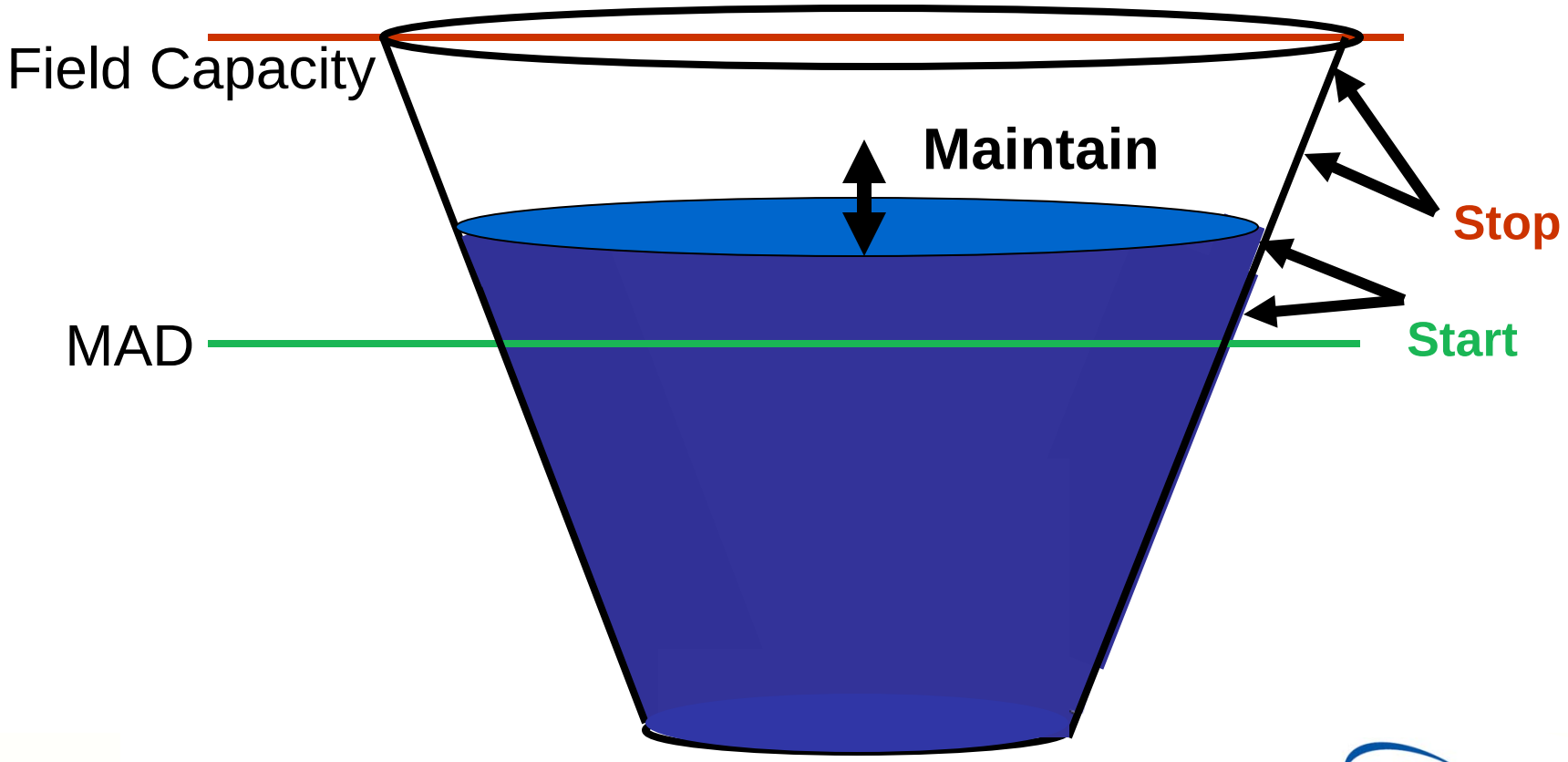
The Basic Principals of Irrigation Management-

-Two Basic Watering Strategies-



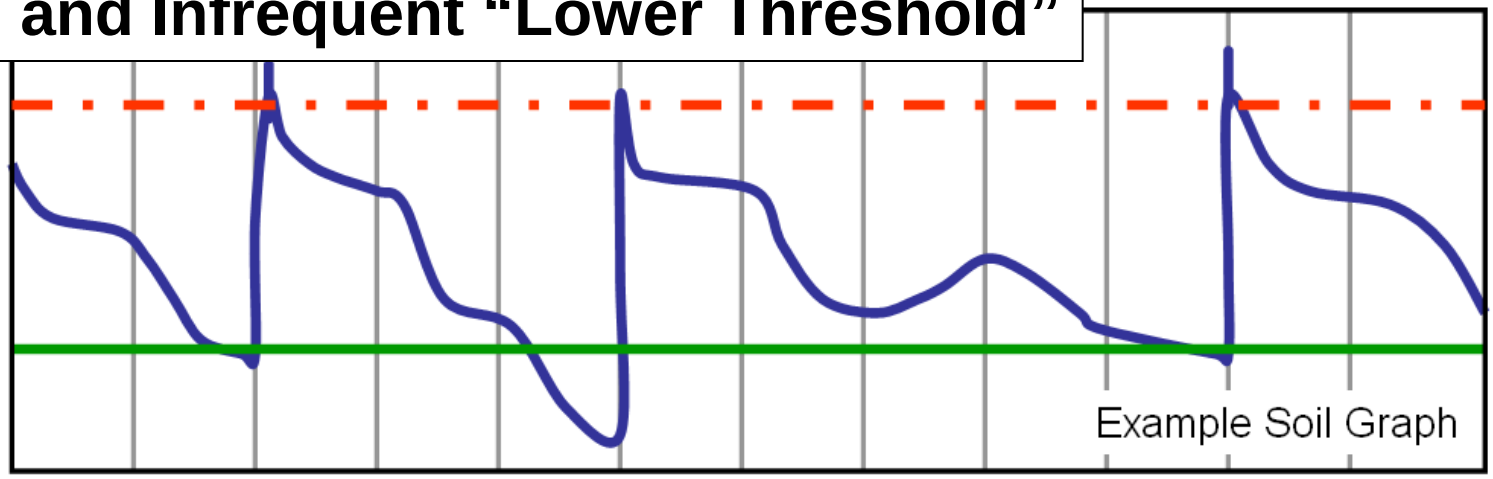
The Basic Principals of Irrigation Management-

-Two Basic Watering Strategies-

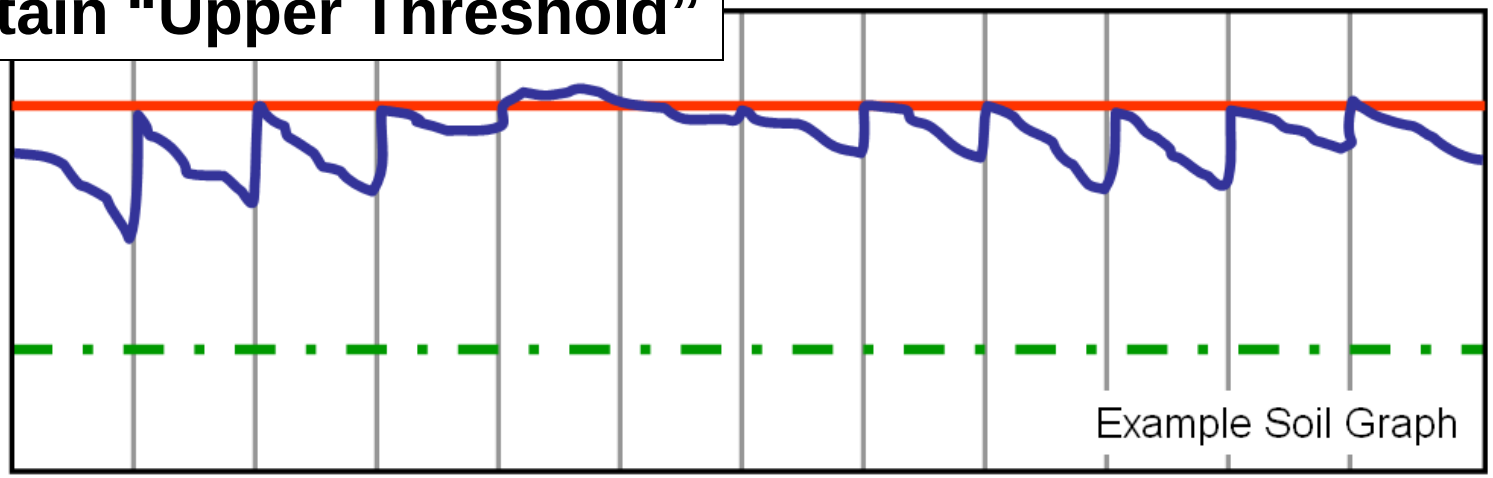


Efficient Irrigation management -

Deep and Infrequent "Lower Threshold"

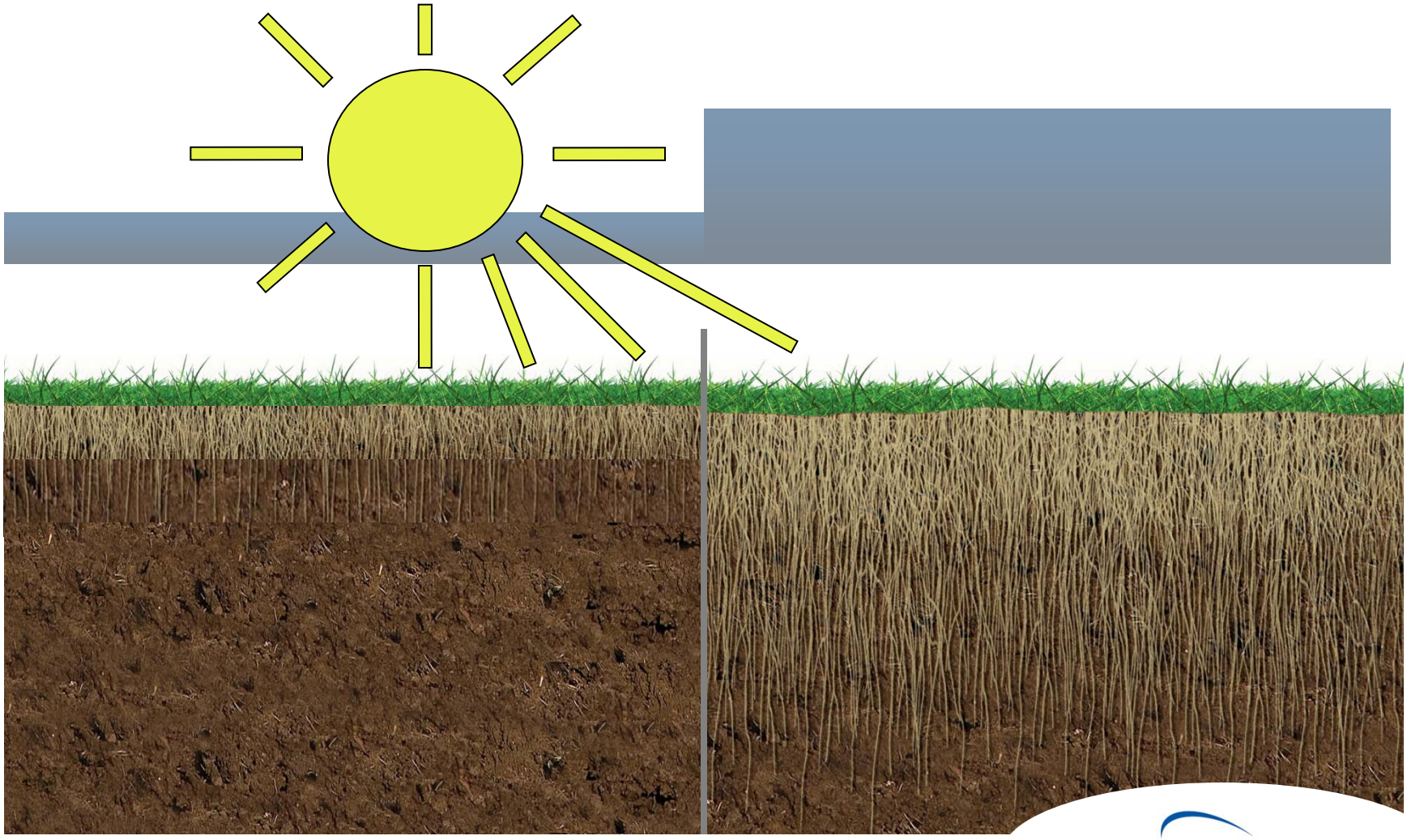


Maintain "Upper Threshold"



The Basic Principals of Irrigation Management-

Deep and infrequent watering will ensure maximum plant water use efficiency (WUE)



The Basic Principals of Irrigation Management-

-Two Basic Watering Strategies-

(When Using a SMS)

Deep and Infrequent

Turn on based on soil moisture (low moisture)

Turn off based on time

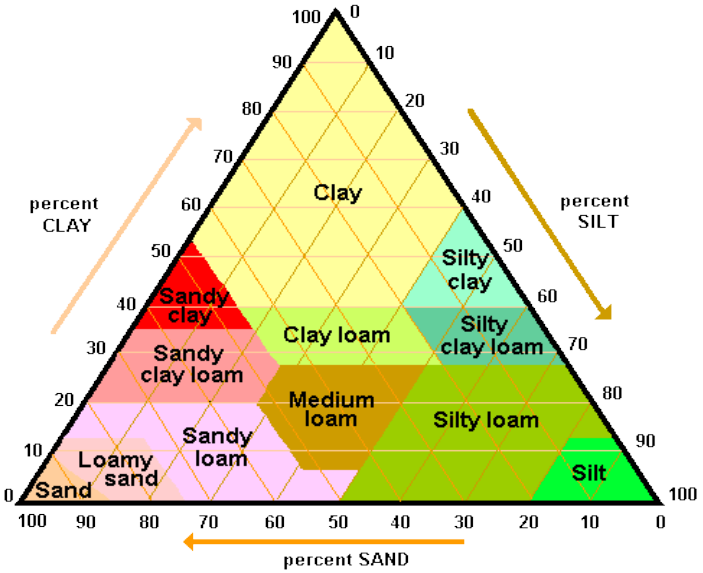
Maintain Moisture level or Schedule driven

Turn on based on time

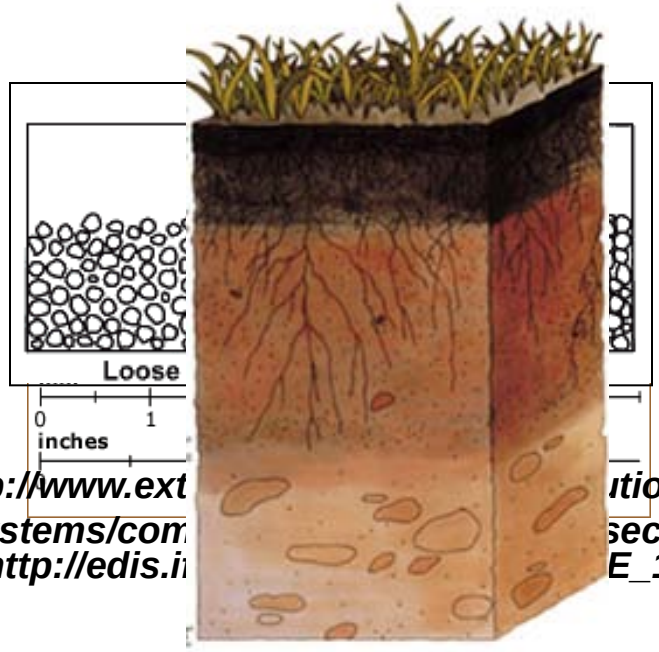
Shut off based on soil moisture (high moisture)

Efficient Irrigation management -

In order to *estimate* the soil moisture it requires soil information, often the irrigator is given a choice; Sand, Sandy Loam, Loam, Clay Loam, Clay.



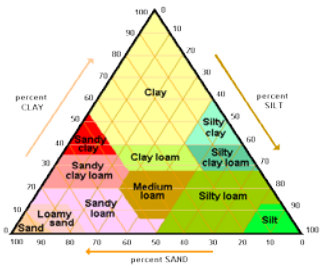
USDA Textural Triangle

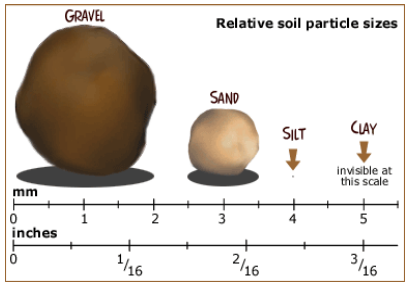


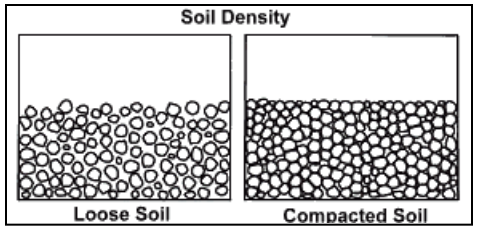
http://www.ext ution/cro
psystems/com section1
http://edis.i E_1

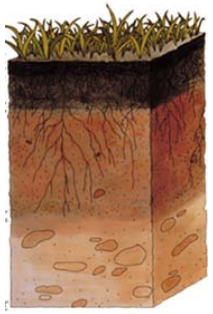
http://soils.usda.gov/education/resources/K_12/lessons/profile/

Efficient Irrigation management -









What do we really want to know?

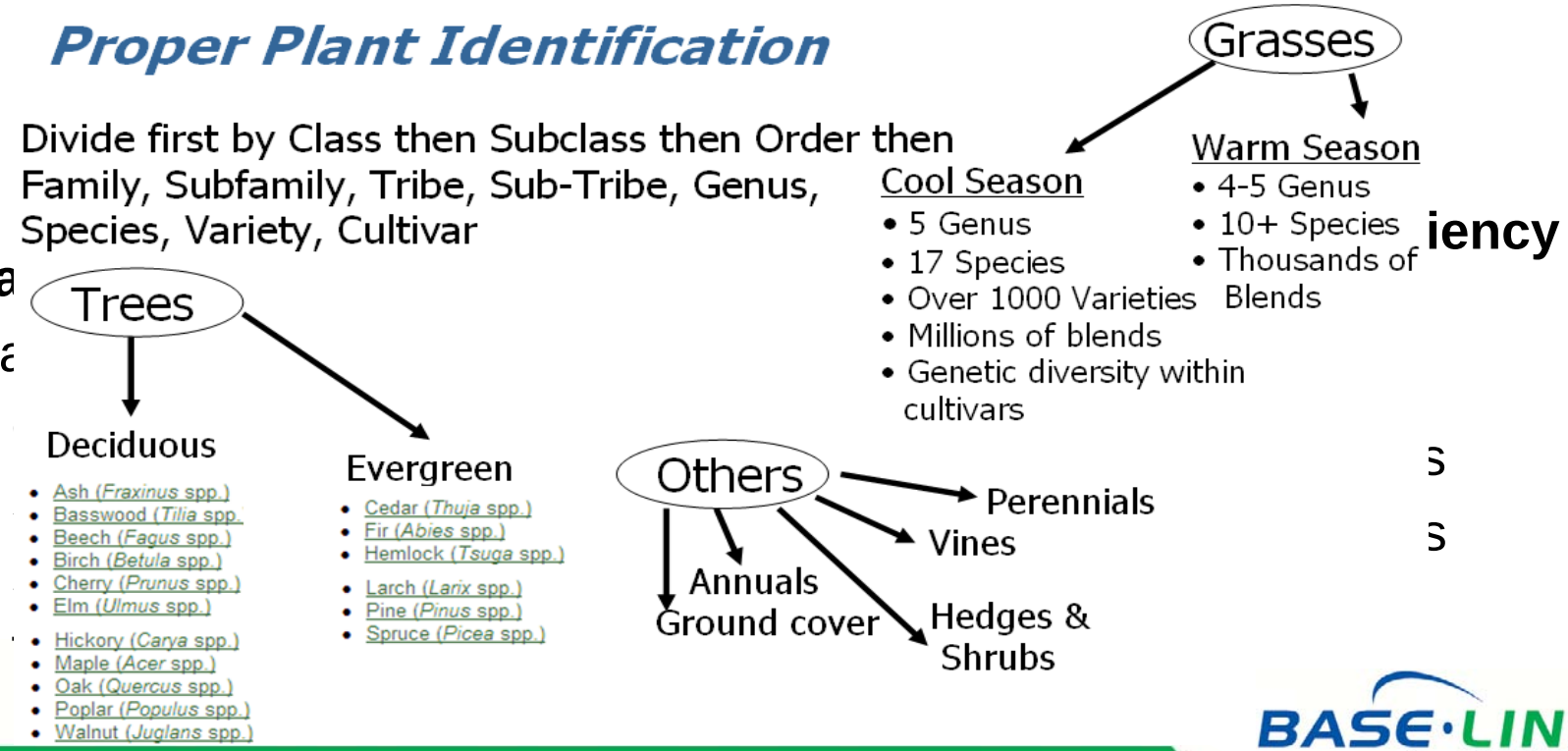
Is the soil in the root zone wet or dry.

Efficient Irrigation management -

In order to *estimate* the soil moisture it also requires plant information, often the irrigator is given a choice; Cool/Warm Season grass, Tree, Shrub... This information is used to estimate how rapidly a group of plants could remove water from the soil, if water is available to remove.

Proper Plant Identification

Divide first by Class then Subclass then Order then Family, Subfamily, Tribe, Sub-Tribe, Genus, Species, Variety, Cultivar



Efficient Irrigation management -

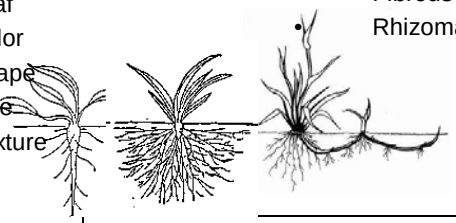
Proper Plant Identification

- **Transpiration Rate**
- Leaf
- Color
- Shape
- Size
- Texture

Water use efficiency

Roots

- Tap roots
- Fibrous roots
- Rhizomatous



Divide first by Class then Subclass then Order then Family, Subfamily, Tribe, Sub-Tribe, Genus, Species, Variety, Cultivar

Trees

Deciduous

Evergreen

Others

Grasses

Cool Season

- 5 Genus
- 17 Species
- Over 1000 Varieties
- Millions of blends
- Genetic diversity within cultivars

Warm Season

- 4-5 Genus
- 10+ Species
- Thousands of Blends

What do we really want to know?

Is the soil in the root zone wet or dry.

Thank You!

Our Mission ~

We intend to forever change the way people water plants by providing the smartest, easiest, and most capable irrigation control products ever made.

BASE·LINE™ IRRIGATION SOLUTIONS