Optimizing Water utilizing Precision Irrigation Technology in West TX

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Expectations:

What is Precision Irrigation?

Why it’s Important – Or is it?

Profits with Precision Irrigation?

Integrated Precision Irrigation Systems?

Implementing Precision Irrigation Systems?

Adoption Planning for Precision Irrigation?
What is Precision Irrigation?

Defining Precision Water Management

Precise, exact, and very accurate, use of water in irrigation.

Expected Result of Precision Irrigation?

Profit
Precision Irrigation IS:

A Concept
A Process
A Mindset
Precision Irrigation is NOT:

VRI

Moisture Probes or Sensors

Fancy Software, Hardware or Mobile Apps
Precision Ag Systems Approach

Which single input will make the greatest impact on the other two?
Water Optimizing Mindset for Maximum Input Utilization
Precision Irrigation Mindset

- Water needs of the plant
  - Plant available water
- Active root zone of crop
- Oxygen needs of the crop
  - Plant available oxygen
- Offsetting or optimizing weather
Capacitance and FDR (Frequency domain)
Capacitance and FDR (Frequency domain)

Send electrical pulse out and measure the reflected frequency changes
The H ions in soil change amplitude of the return wave

Advantages
- Quicker response than the TDR probes
- Can measure salts by changing frequency of oscillation

Disadvantages
- Still need calibration
  CM’s Drill and Drop probe comes with standard soil calibration but can be reprogrammed for specific sites
Your System is FDR probe that measures dielectric constant of zone surrounding sensors

- Dielectric constant
  - Air ........... 1
  - Soil.......... 5
  - Water....... 80
- Capacitor works with oscillator to generate AC field
  - Changes the polarity of water molecules
- Comes with factory calibration that works in all soil types
  - Can customize the calibration if needed
How much should we irrigate?

When should we irrigate?

Precision Technology

??

How much should we irrigate?
What’s happening below the ground?
What’s the cost of estimating?

The #1 way to **SAVE** money?
**ELIMINATE WASTE**
The #1 way to **MAKE** money?
**MAXIMIZE ROI**

*Return on INPUT!*
Irrigation Event
Rain or Mechanical

Little to No Moisture Content Change

Substantial Moisture Content Change

Refill / Recharge

Full Profile
Irrigation Efficiency

Sum 77%

Soil Water Content (inches)

13 Jul 12.3 12.8 12.9 13.1 13.0
12 Jul 12.5
20 Jul 12.4
27 Jul 12.6

.5 .5 .6 .4

.65” application
Irrigation Efficiency

85%

.85” application
A Healthy Soil Moisture/Nutrient Profile
Precision Irrigation Mindset

INTEGRATED Systems Approach

• Apply water
  • At the right time
  • In the right amount
  • On every part of the field
  • increase profitability
  • maximize irrigation efficiency
  • conserve natural resources
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<th>2 Types of Variability</th>
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<td>Non-Changing</td>
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The Opportunity **Unchangeable** Soil Provides
Opportunity Within Unchangeable Data

(Fixed Variability)

Soil is a fixed variable

Horizontally & Vertically

Two soils with different nitrogen loss characteristics found within the same 2.5 acre grid and USDA Soil Survey unit by a Veris soil sensor. Courtesy of Agrilab.com
Optimize Every Acre
In Every Field
Every Time!
Opportunity Within Unchangeable Data

(Fixed Variability)
Lloyd Arthur - Ralls, TX

Cotton Planted multiple times due to weather, finally got a good stand the first of June.

Split in half VRI vs Flat Rate of 1”

Flat Rate will need at least one more irrigation to finish out.
Nozzle Spacing Differences

80” drop spacing

40” drop spacing
Kelly Kettner – Muleshoe, TX

VRI with Split Pivot Corn/Cotton

Corn – 1” applications early then switched to 1.5” applications

Cotton – 0.5” application early then switched to 1” applications

Started year at 360, then renozzled to 300 mid season

Corn planted at 23K, chopped for silage and made 25 tons

Very consistent plant height, ear size and yield across all regions

Cotton had very even emergence across all zones, will see what yields turn out
The Right Amount of Water in the Right Place

More Water = More Yield? Not Always!

Optimized Growth System = More Yield!!

In ALL Areas of the Field!
**integrate**

/ˈɪn(t)ɪˌɡreɪt/

verb

1. combine (one thing) with another so that they become a whole

   "transportation planning should be integrated with energy policy"

   synonyms: combine, amalgamate, merge, unite, fuse, blend, mingle, coalesce, consolidate, meld, intermingle, mix;  More

2. bring (people or groups with particular characteristics or needs) into equal participation in or membership of a social group or institution.

   "integrating children with special needs into ordinary schools"
Precision Implementation Requirements

- Scheduling System
  - Probe
  - Good Software
  - Irrigation Forecast
  - Crop Staging
  - Root Growth Plan

- Pivot Controller
  - Lindsay
  - Valley
  - AgSense
  - FieldWise
  - Pivot Trac
Most Important
Implementation Requirement

Know YOUR Why

• “Root” Cause
• Change Objective
• Goals - Expectations
Precision Irrigation Adoption Planning

NEVER Plan to Not Lose

ALWAYS Plan to WIN!!!
Technology is **NOT** the Solution

The **ADOPTION** of Technology is the Solution
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