JOHN DEERE WATER

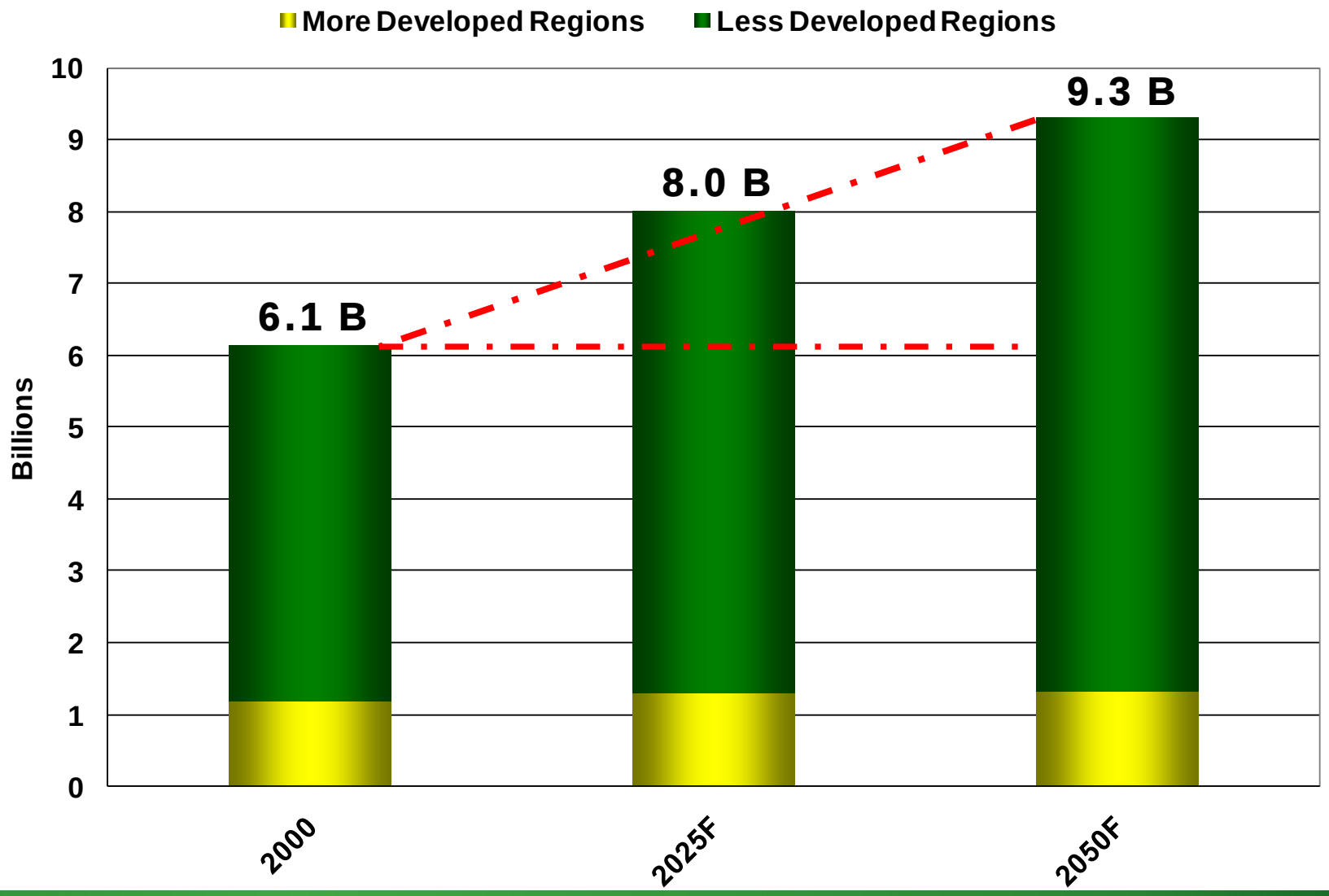
Agenda

- Importance of water
- Soil Moisture Monitoring
- Mechanized and Drip Irrigation Trends
- Questions

John Deere Water

Importance of Water

Global Population Growth



Source: United Nations, World Population Prospects 2010 Revision

Worldwide Population Growth Requires More Food, Feed and Fuel

In **50** years, the world **population** will require ▶ **100%** more **food,**[1] and ▶ **70%** of this food must come from efficiency-improving **technology**[2]

Source: Simmons (2009)

Dynamics of Food Demand

Fast food packaged food

Per Capita Income

Services

>$10 per day

Processed Products

$2.50-10 per day

Livestock Products

27% of world's population
(Most hunger problems solved at $2.50 threshold)

$1.25-2.50 per day

Commodities

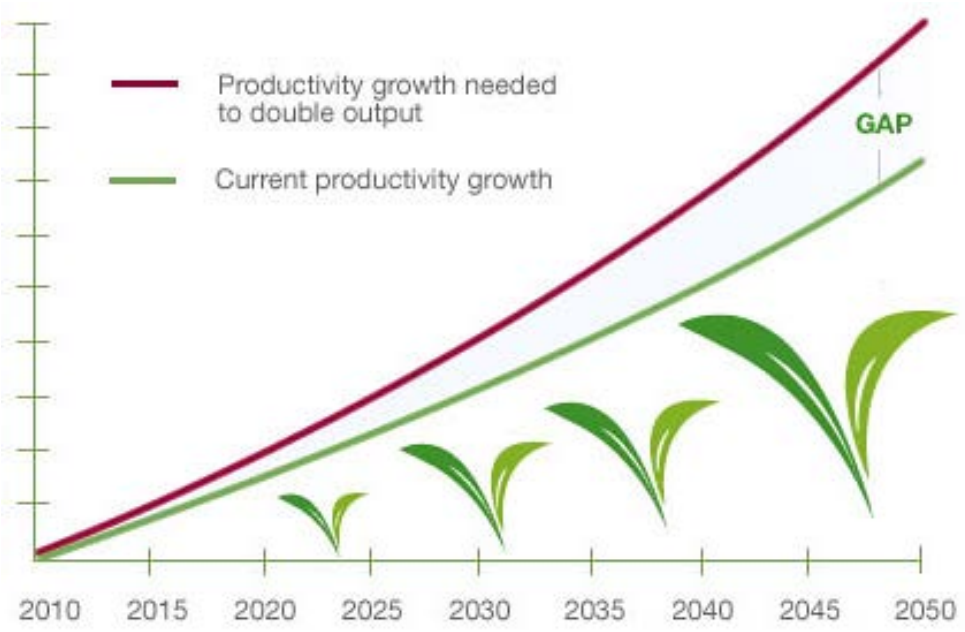
20% of world's population
(2/3rds experience hunger & malnutrition)

<$1.25 per day

Source: World Bank, 2008

The Challenge is to Close the Productivity Gap

Global Harvest Initiative Productivity Index



- Satisfying the expected food and feed demand will require a **substantial increase** of **global food production** of **70 percent** by 2050
- Investment in agriculture must increase 50 percent by 2050
- Experts agree that the biggest **productivity** levers are:
  - **Mechanization**
  - **Irrigation**
  - **Genetics**

Source: Global Harvest Initiative, UN FAO, How To Feed the World In 2050

The Water Opportunity

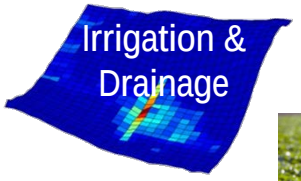
Macro-economic trends:

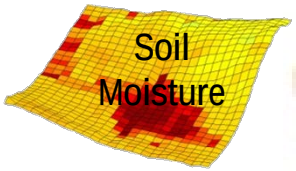
- Population Growth
- Changing Diets
- Supply/Demand Imbalance
- Climate Variability/Change
- Biofuels
- Subsidies

Water Debate:

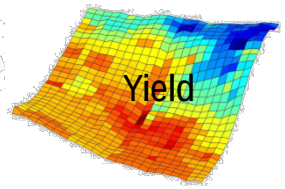
- Competing uses of water
- Water rights and policy
- Pricing issues
- Conservation vs. increased supply
- Environmental
- Control of resource

Opportunity





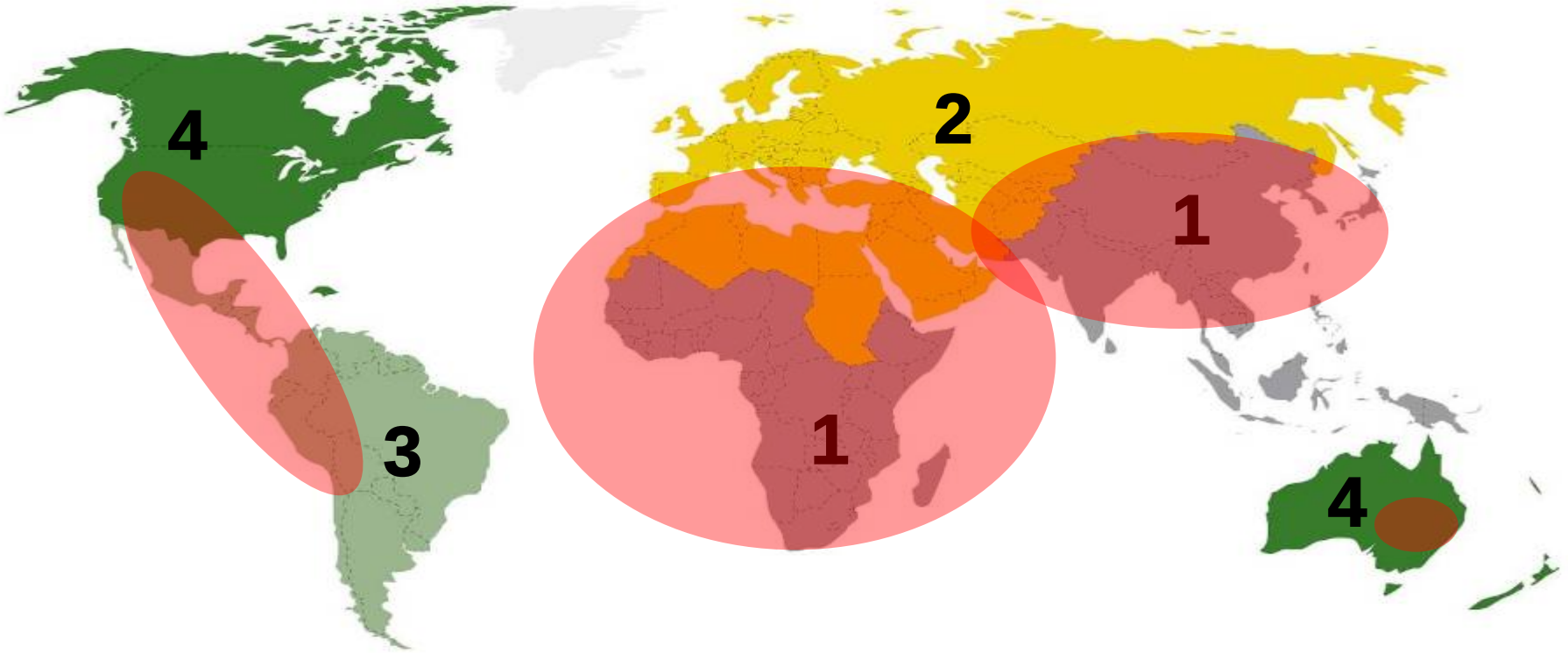
Improving output per unit of input



JOHN DEERE WATER

Water is Scarce in Key Markets

Water scarcity constrains agricultural growth



Water management enables agricultural productivity

Areas of physical and economic water scarcity

Source: International Water Management Institute

JOHN DEERE WATER

Agricultural Irrigation

Gravity
>50%
40%-60% IE

Drip/Micro
<10%
85%-95% IE

Sprinkler
~30%
70%-80% IE

Global Freshwater Withdrawals

Irrigated agriculture accounts for 18% of all agricultural land and 40% of all food production

JOHN DEERE WATER

Water Management Headlines

Drought

U.S. Drought 2012: Half Of Nation's Counties Now Considered Disaster Areas

By JIM SUHR 08/01/12 10:16 PM ET AP

Genetic Traits

Farmers turn to engineered corn to adapt to drought. But will it be enough?

Posted by Brad Plumer on August 15, 2012 at 8:40 am

Drought-Tolerant Corn Efforts Show Positive Early Results

Types of genetically modified corn could offer modest protection for drought tolerance and might help individual farmers recoup yield losses in drought conditions

By Tiffany Stecker and ClimateWire

Environmental Impact

Farming: Wasteful water use

Excessive water use for agriculture is leaving rivers, lakes and underground water sources dry in many irrigated areas.

Westlands Water District facing imminent water shutdown

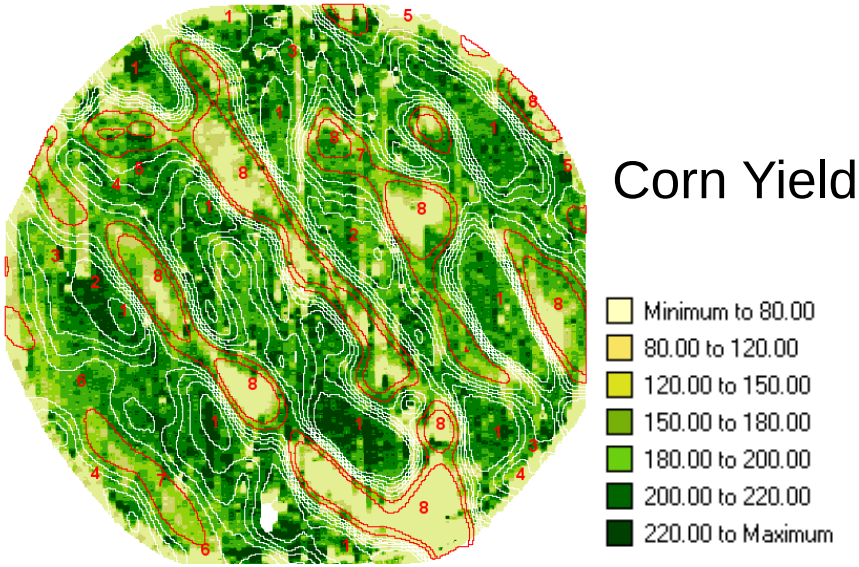
Idaho trout left high and dry by irrigation ditches

ROCKY BARKER
Idaho Statesman

Impact of Water on Field Variability

Key factors of field variability

- Water –too little or too much
- Nitrogen
- Crop establishment
- Hybrid or variety
- Seed rate
- Soil fertility



John Deere Water

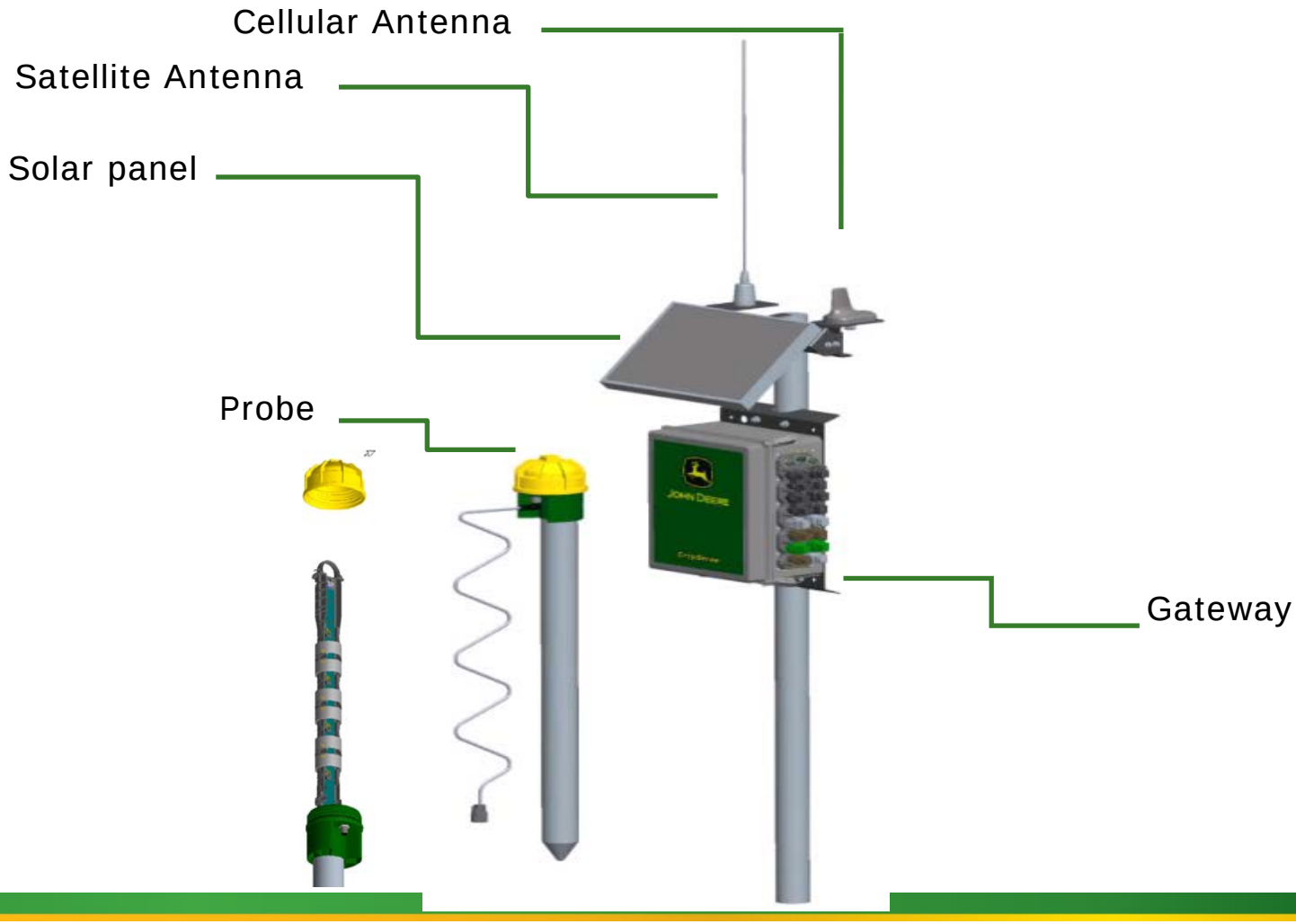
Soil Moisture Monitoring

John Deere Field Connect – Making Sense out of Soil Moisture Monitoring

JOHN DEERE

Field Connect Product Line and Technology

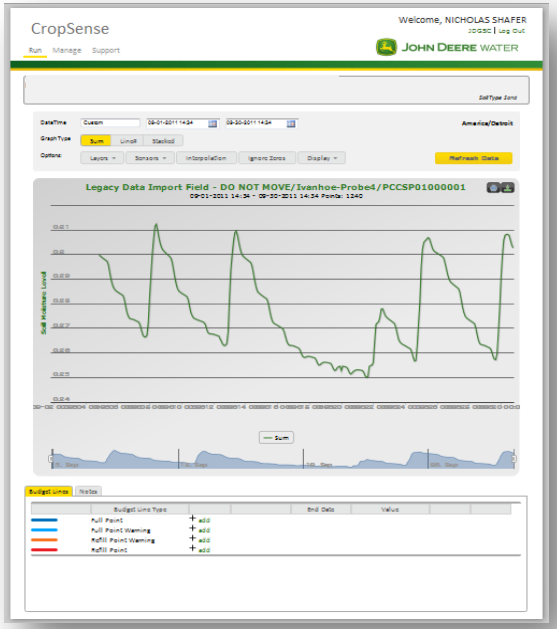
Field Components



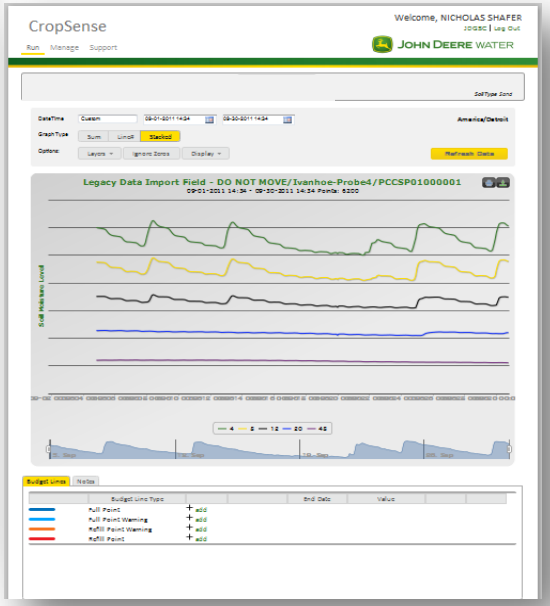
Web Application

Data Collection - Graph Types

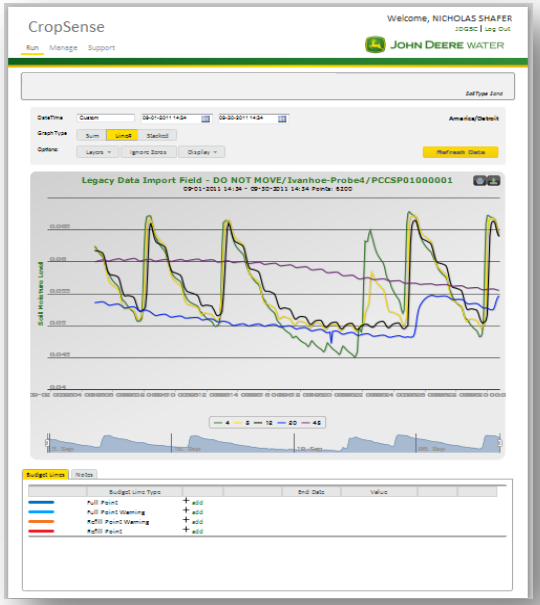
Field Connect graphs soil moisture readings both at individual sensor levels and over the monitored profile.



Sum Graph



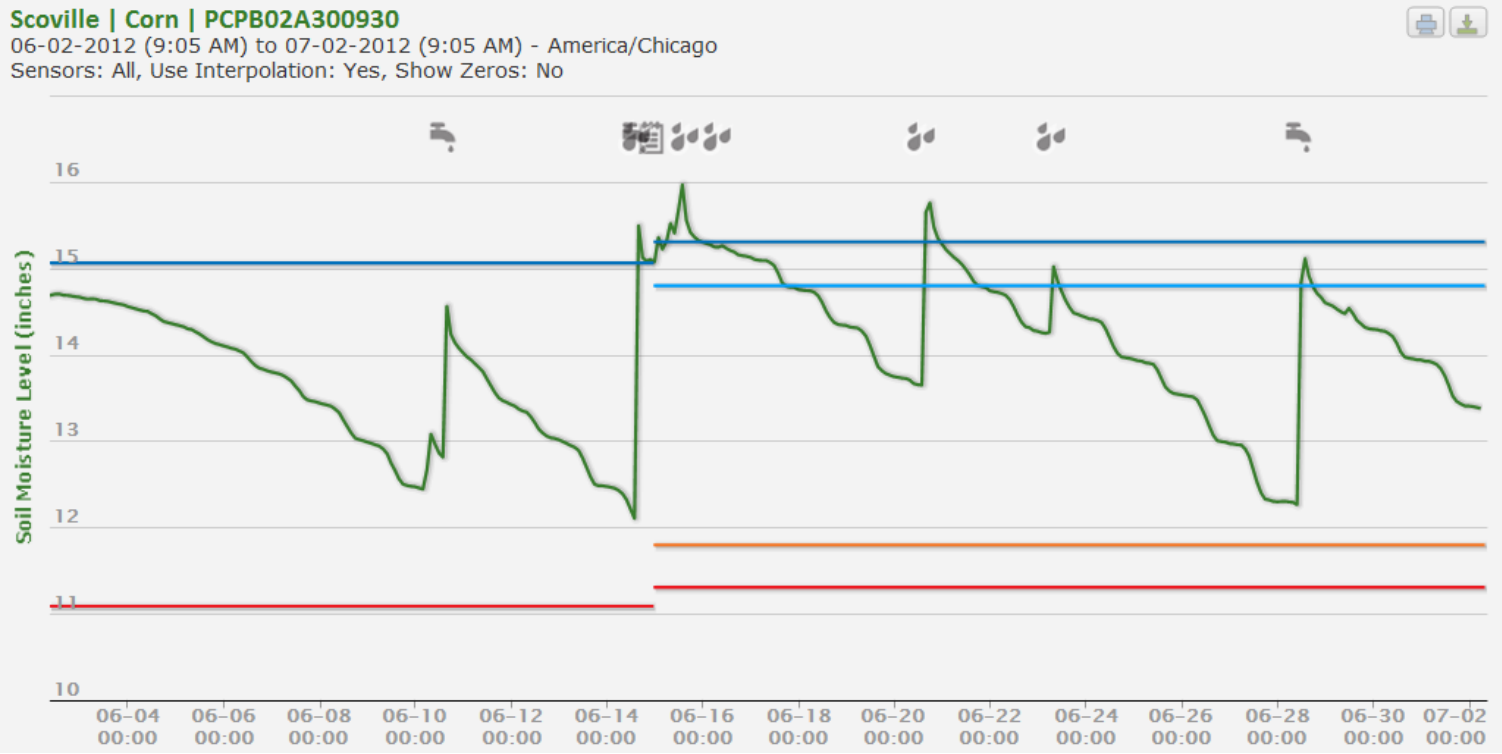
Stacked Graph



Line Graph

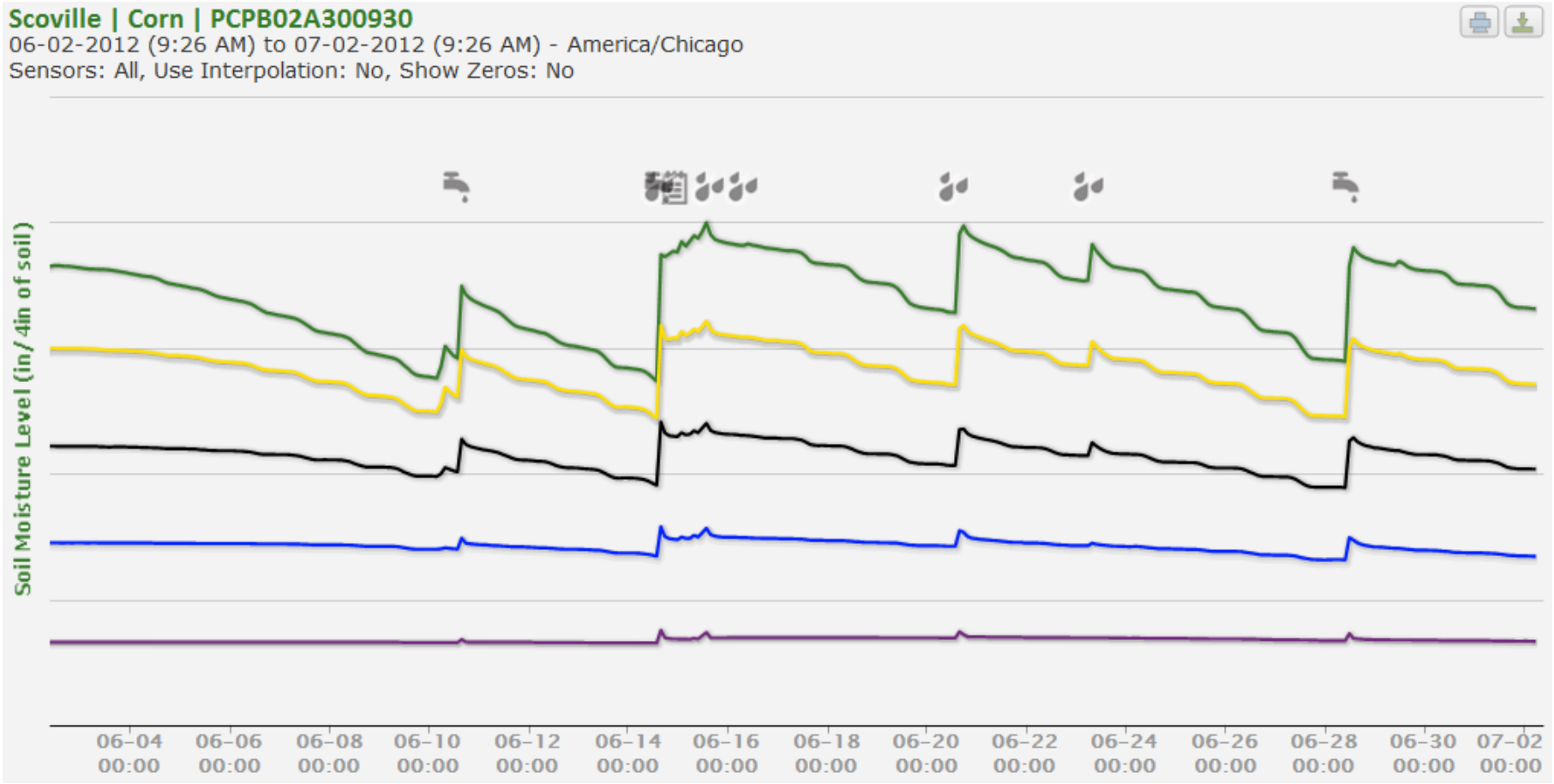
Benefits of Sum Graph

- Shows total soil moisture for all sensors on a single line.
- Budget lines available:
  - Full Point
  - Full Point Warning
  - Refill Point Warning
  - Refill Point



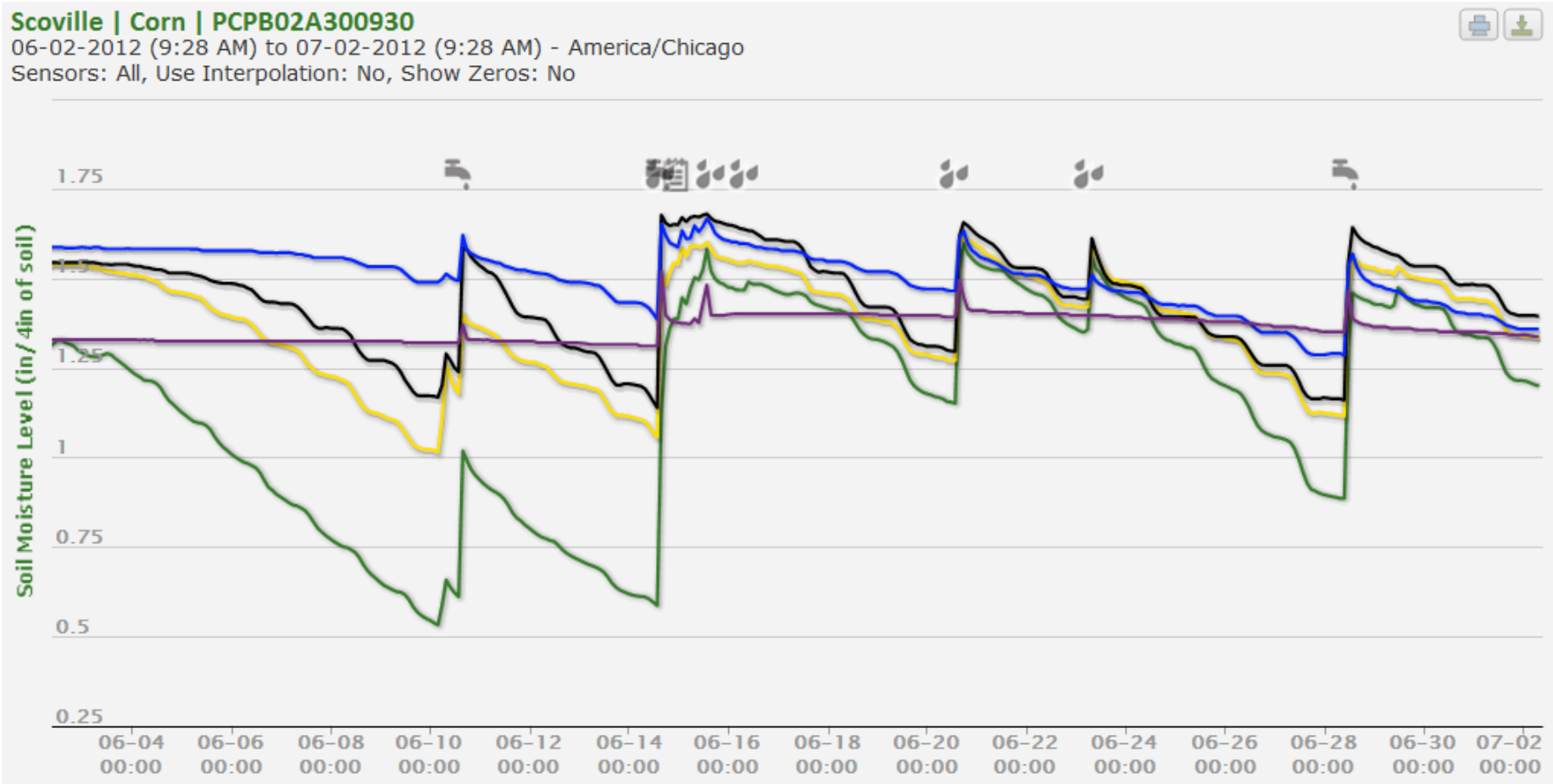
Benefits of a Stacked Graph

Shows relative soil moisture and water movement of each sensor from top to bottom.



Benefits of a Line Graph

Shows the soil saturation level at each sensor level



Field Connect

Why Customers Care

Improve Plant Health

Manage Induced Crop Stress

Better Quality and Yield

Reduce Fuel

Optimize Inputs

Improve Water Management

Quantify the Customer Value

2010 QTV Results*	
Avg. Energy Cost Savings	$11.35 per Acre
Avg. Increase in Yield	5.5 Bushels per Acre
Avg. Additional Yield Income	$25.00 per Acre
Avg. Net Profit Increase	**$36.35 per Acre**

Additional Savings

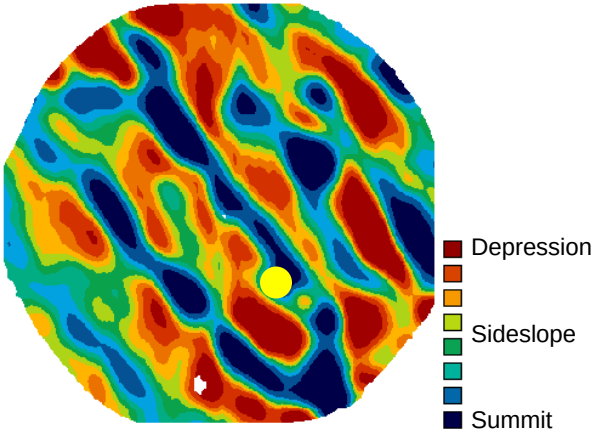
Avg. Amount of Pumped Water Saved	**2 acre inches per Pivot**

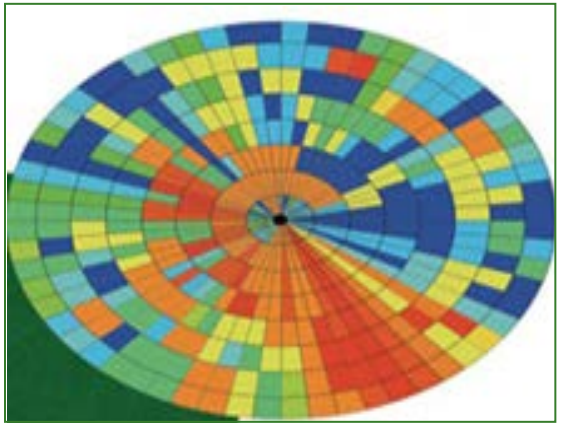
*Fontanelle Hybrids 2010 Aqua View℠

John Deere Water

Irrigation Trends

Growth of Mechanized Irrigation and VRI Technology





JOHN DEERE WATER

Expansion of Drip Micro Technology

- GPS Installation and Management
- Expansion in broad acre crops
- Difficult fields
- Fertigation/chemigation

Questions