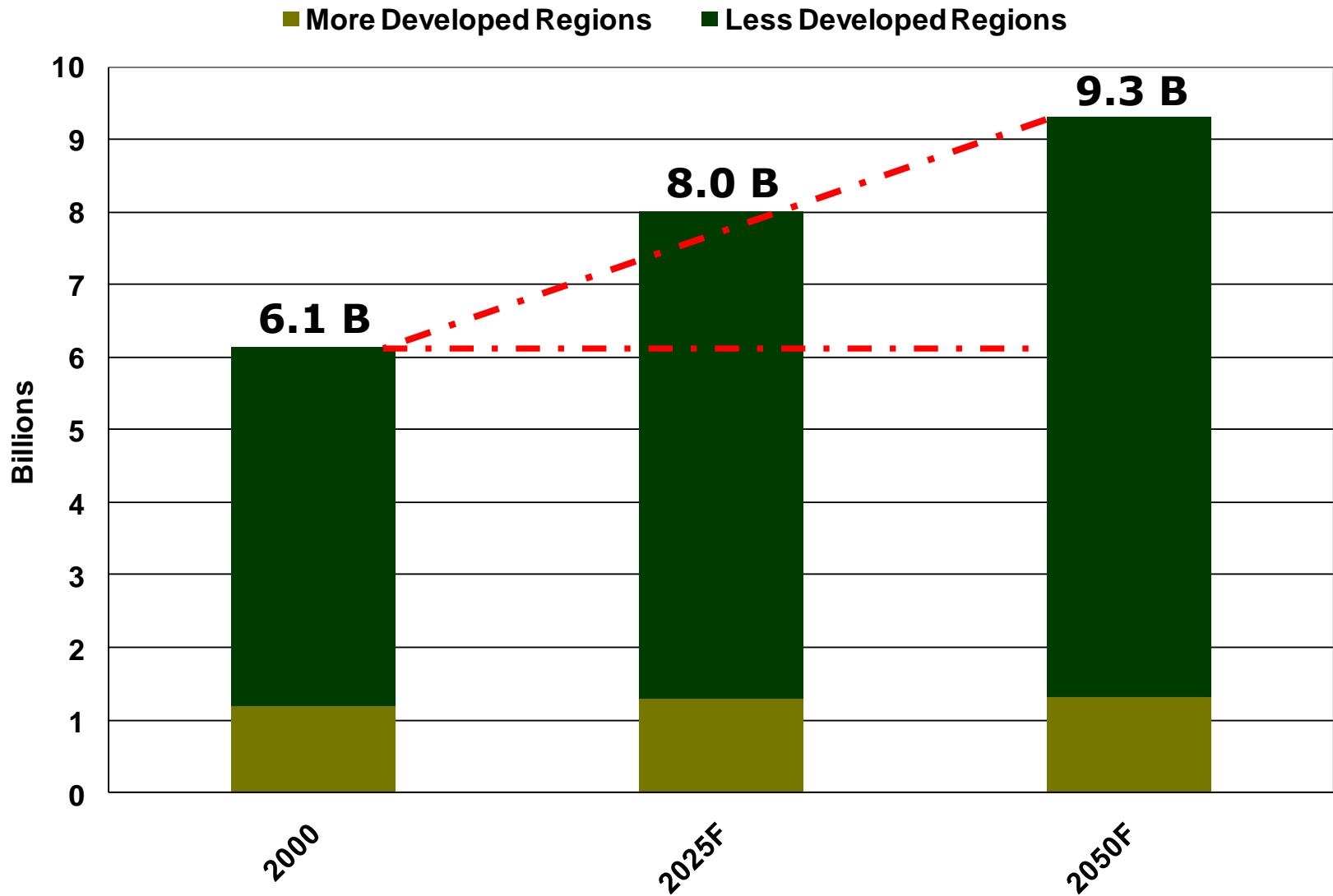


Water.  
You can't grow without it.



# 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**,<sup>1</sup> and



**70%**  
of this food must come from  
efficiency-improving **technology**<sup>2</sup>

Source: Simmons (2009)



**JOHN DEERE WATER**

# The Water Opportunity

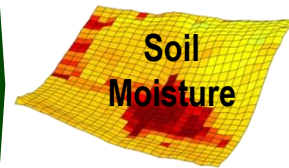
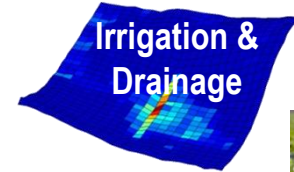
## Macro-economic trends:

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

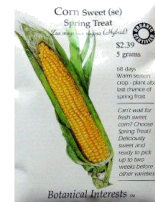
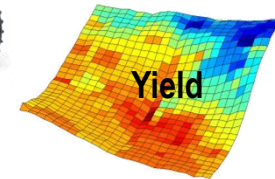
## Water Debate:

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

Opportunity



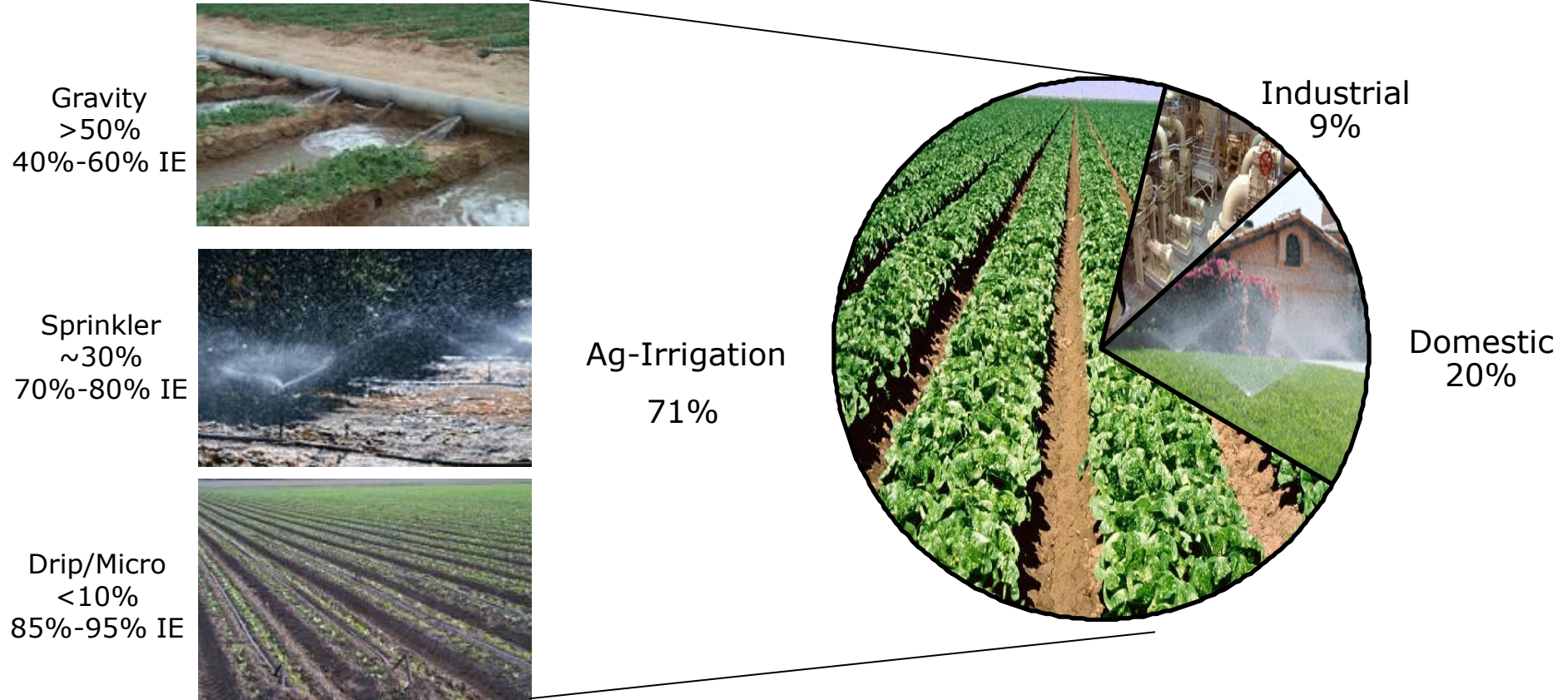
Improving  
output  
per unit of  
input





# Agricultural Irrigation

## Global Freshwater Withdrawals



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

# 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

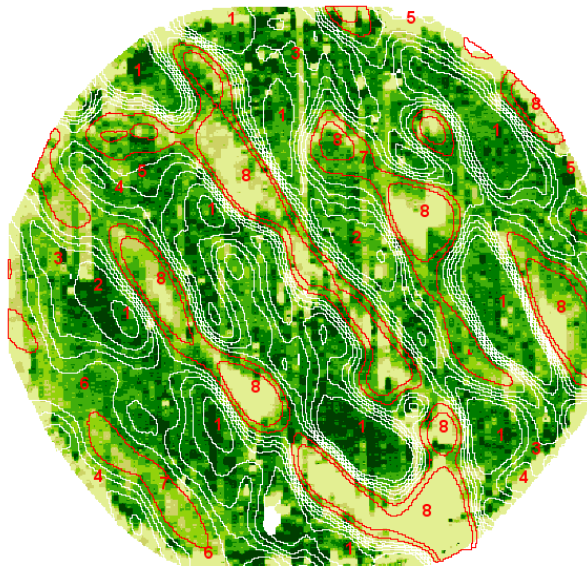
ROCKY BARKER  
Idaho Statesman



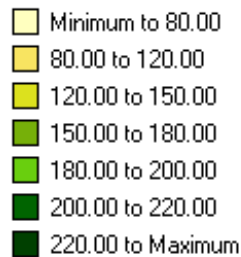
# Impact of Water on Field Variability

## Key factors of field variability

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



Corn Yield



# Water Management Investment Areas

## Drainage

- Tiling
- Land Leveling
- Waterways

## Irrigation

- Drip/Micro
- Mechanized
- Gravity

## Management

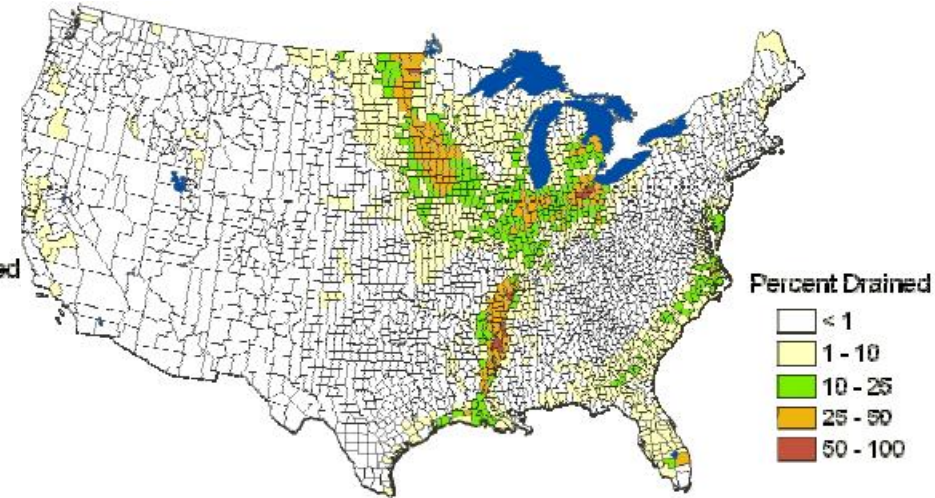
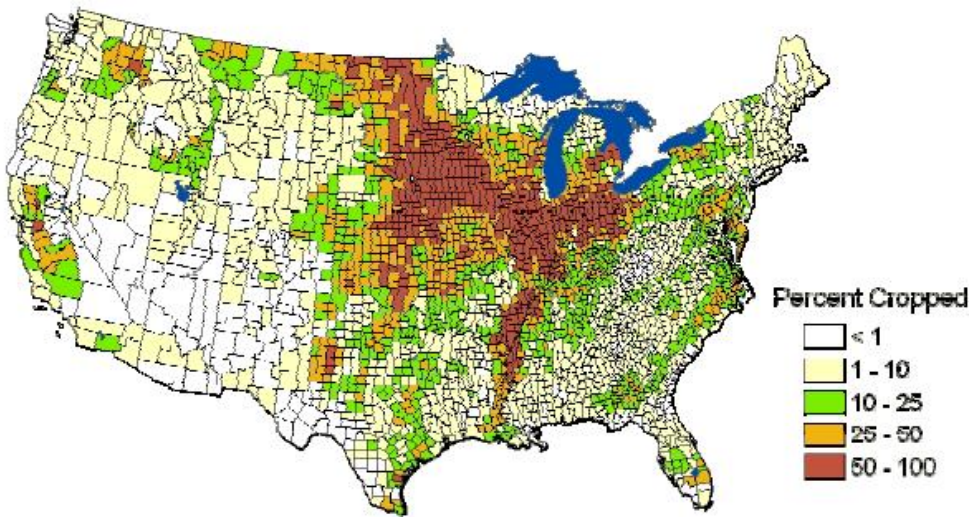
- Soil Moisture monitoring
- Environmental monitoring
- Remote management



# “How much drainage is yet to be done?”

## Percent Cropped by County

## Percent Drained by County



Jaynes, D. B. and D. E. James. (2004) “The Extent of Farm Drainage in the United States,” Available at:  
<http://www.ars.usda.gov/SP2UserFiles/Place/36251500/TheExtentofFarmDrainageintheUnitedStates.pdf>



JOHN DEERE WATER

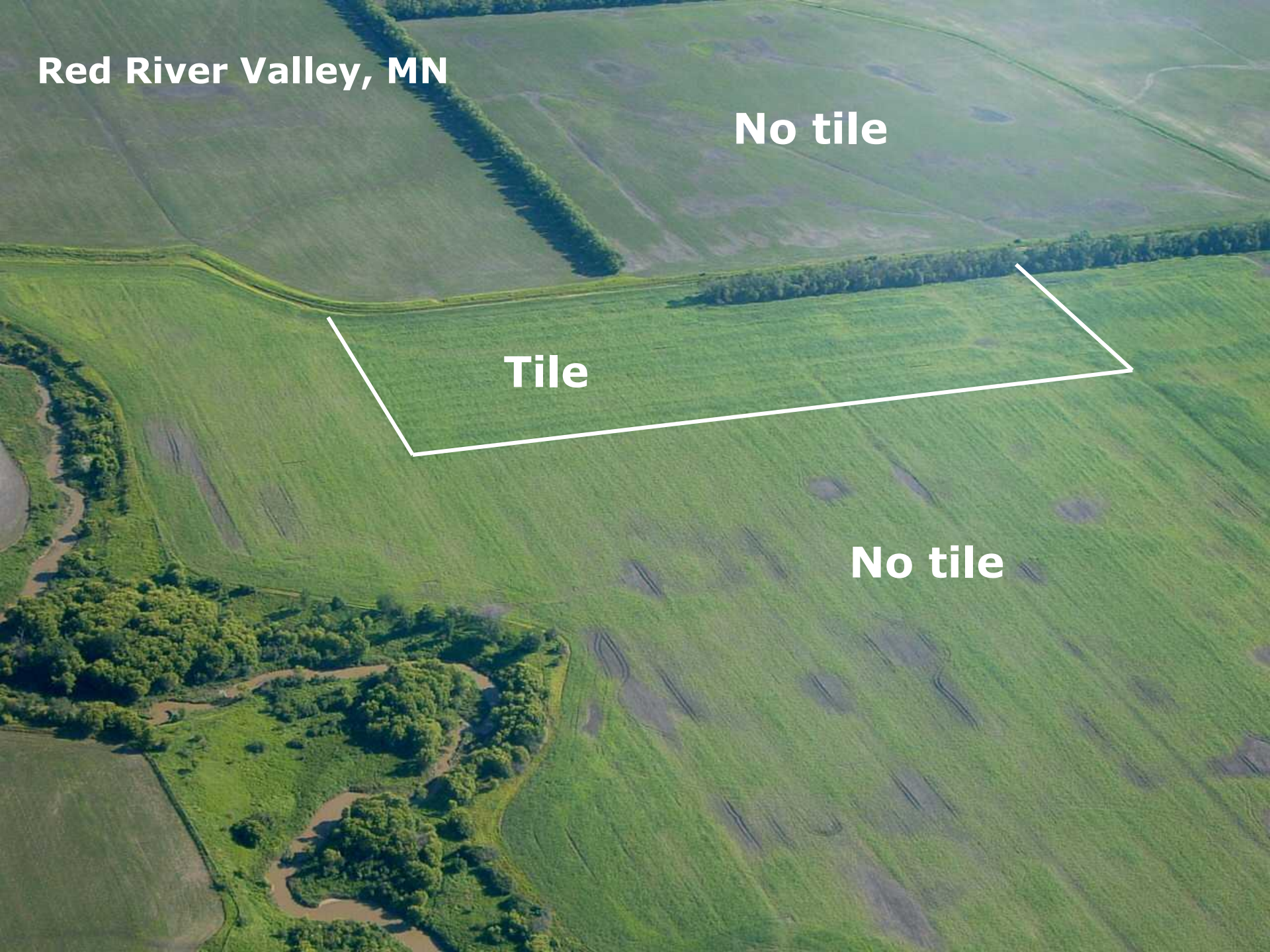


**Red River Valley, MN**

**No tile**

**Tile**

**No tile**

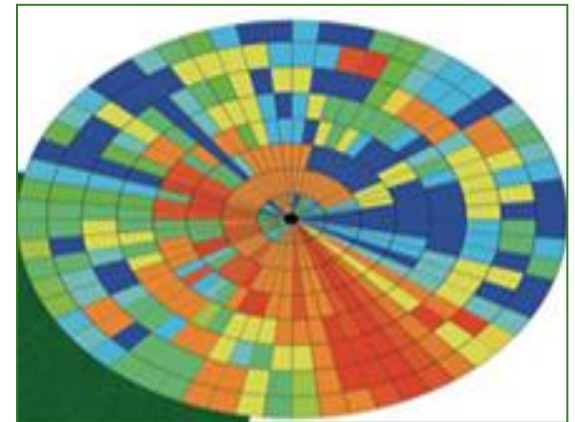
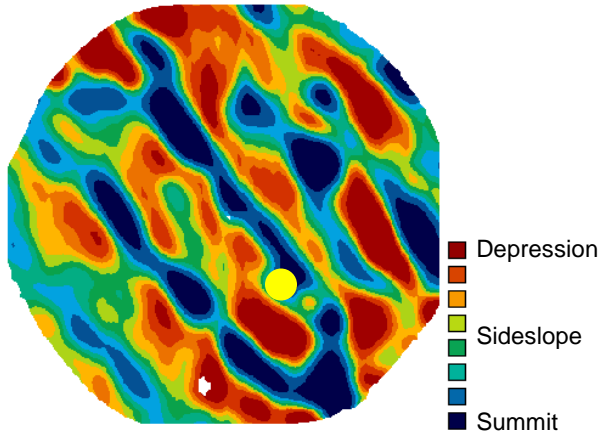




# Growth of Mechanized Irrigation and VRI Technology



CENTER-PIVOT SPRINKLER SYSTEM \*



# Expansion of Drip Micro Technology



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



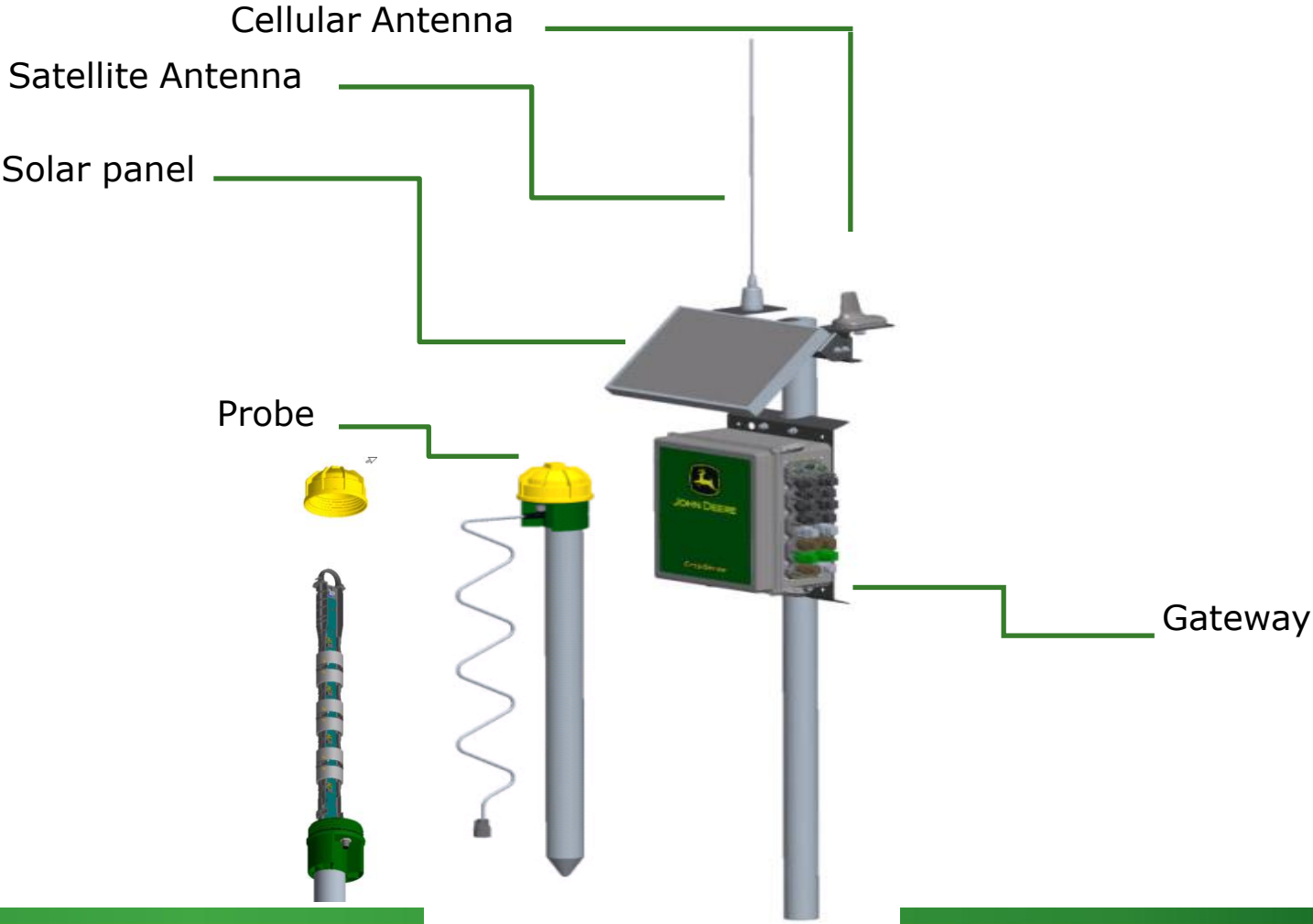


# John Deere Field Connect – Making Sense out of Soil Moisture Monitoring



# Field Connect Product Line and Technology

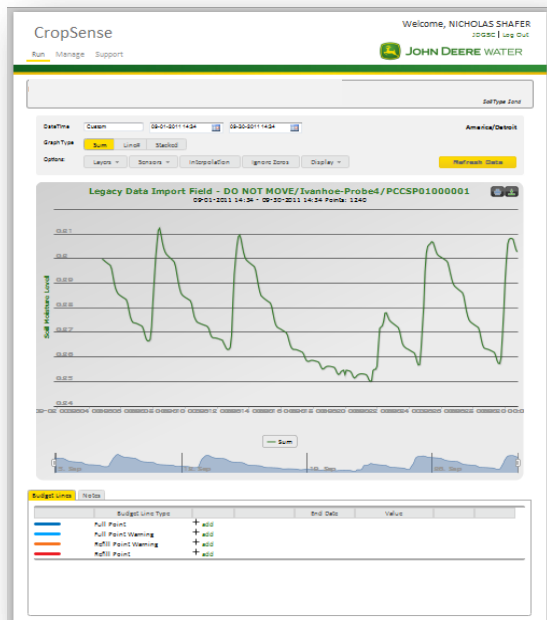
## Field Components



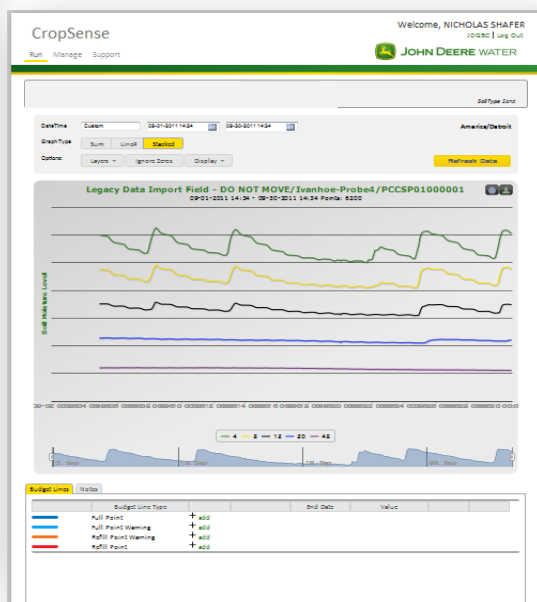
# Web Application

## Data Collection - Graph Types

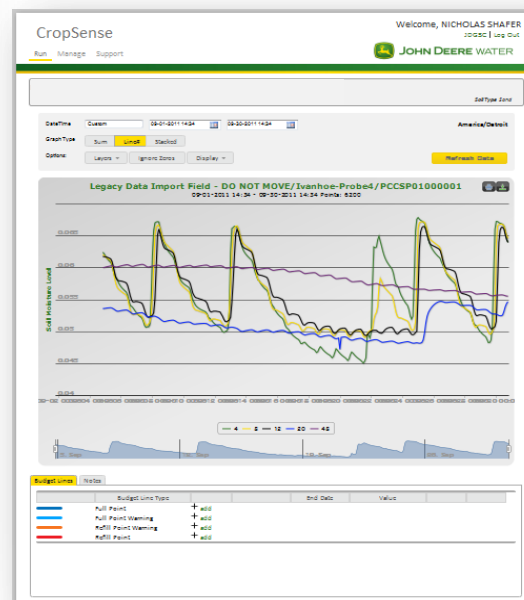
Field Connect graphs soil moisture readings both at individual sensor levels and over the monitored profile.



Sum Graph



Stacked Graph



Line Graph





# Field Connect

*Why Customers Care*





# Quantify the Customer Value

<b>2010 QTV Results*</b>	
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
<b>Avg. Net Profit Increase</b>	<b>\$36.35 per Acre</b>

## Additional Savings

<b>Avg. Amount of Pumped Water Saved</b>	<b>2 acre inches per Pivot</b>
--	--------------------------------

\*Fontanelle Hybrids 2010 Aqua View<sup>SM</sup>