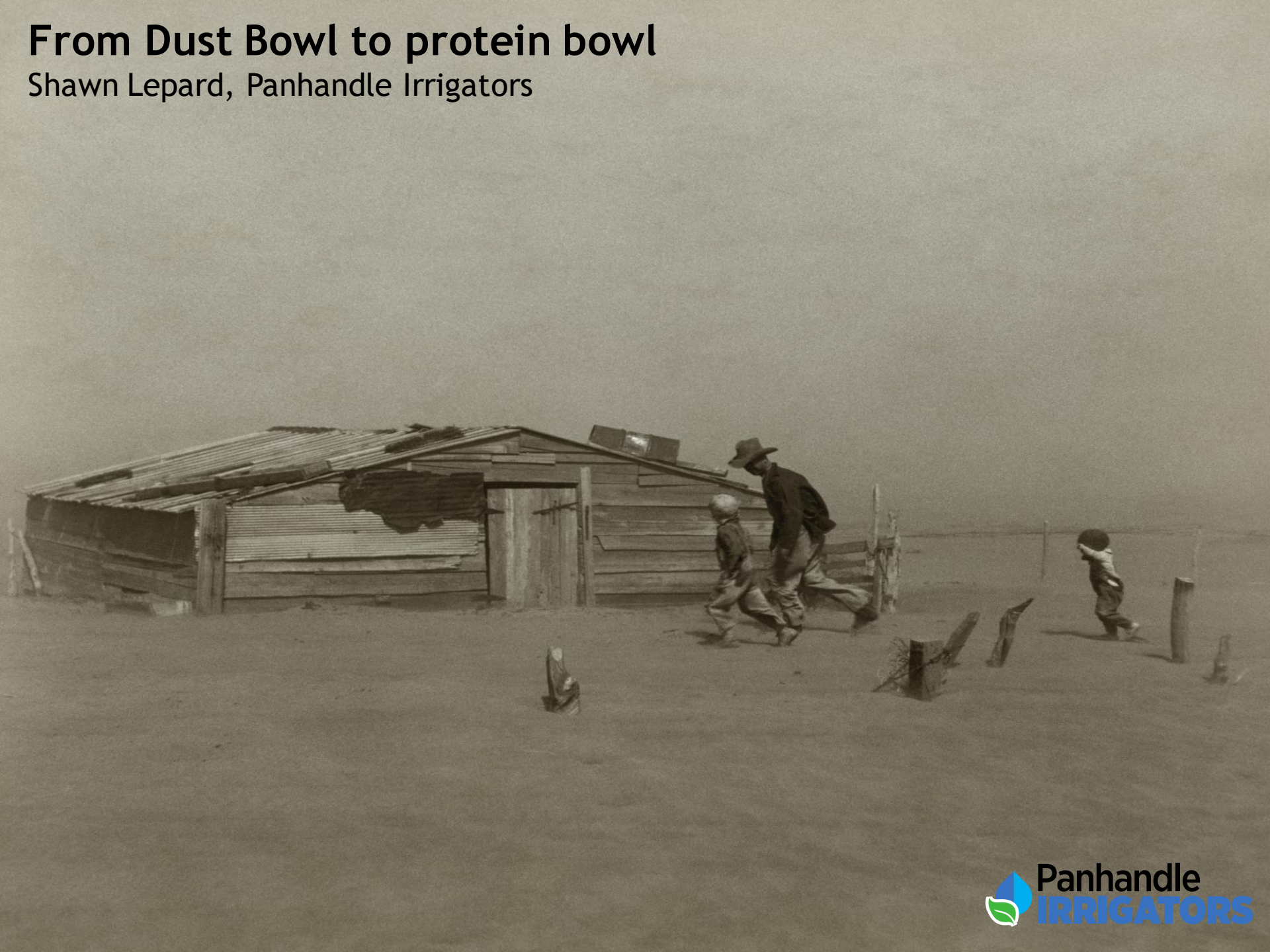


From Dust Bowl to protein bowl

Shawn Lepard, Panhandle Irrigators

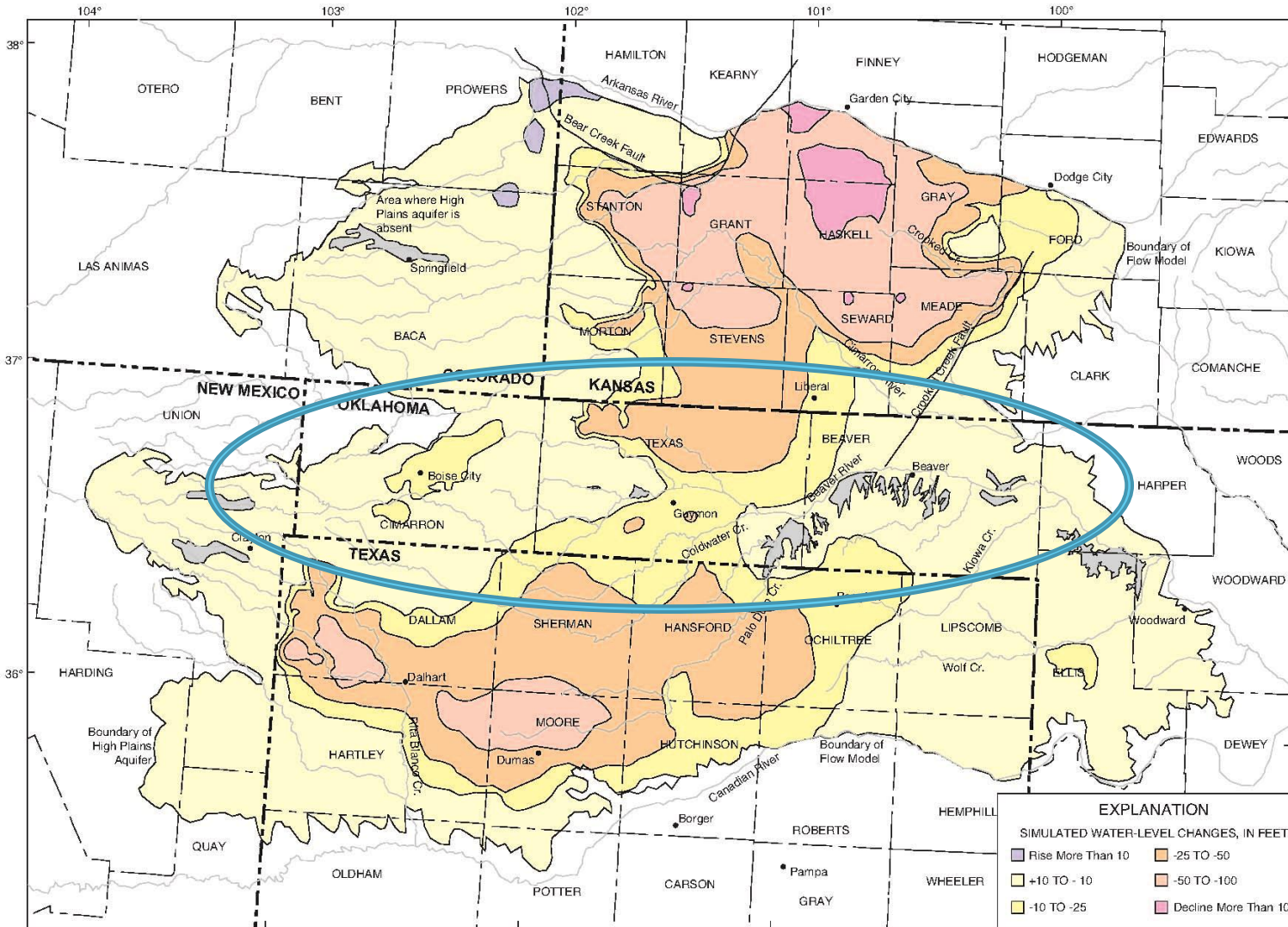


Oklahoma Panhandle

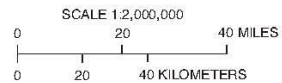
Beaver, Cimarron and Texas Counties

- ▶ Three top Ag producing counties in OK
- ▶ Ogallala aquifer used to grow corn
- ▶ Corn used to feed cattle and hogs
- ▶ Regional processing of beef and pork leading producers and exporter of American protein

Water Level Changes 1998-2020



Albers Equal-Area Conic Projection
Standard Parallels at 29.5° and 45.5°
Central Meridian at 96.0°



Costs

- ▶ Significant cost of drilling a well, irrigation equipment and fuel costs for pumping water
- ▶ Motivation for water conservation and efficiency is prioritized by economics rather than policies

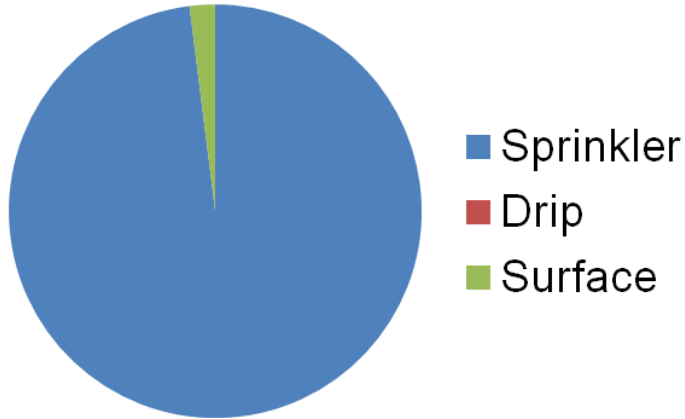


- ▶ No till leaves all of the previous crop residue on the soil surface, protecting it from wind erosion and evaporation.
- ▶ When the crop is seeded, only a narrow band of residue is moved out of the way allowing the seed to be put into the soil.
- ▶ Using pre-emerge chemical control ensures that weeds never grow and use moisture that is meant for a crop.

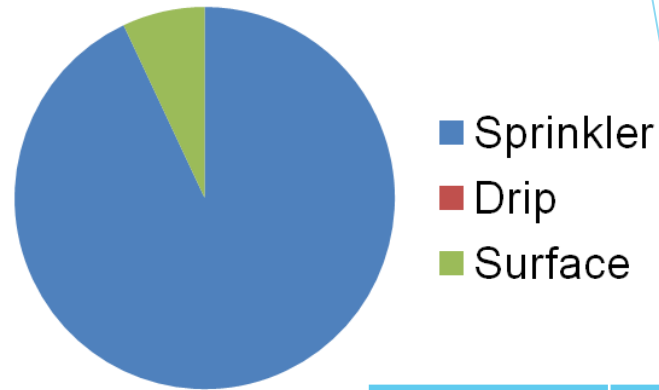


Are We Irrigating Our Crops Efficiently?

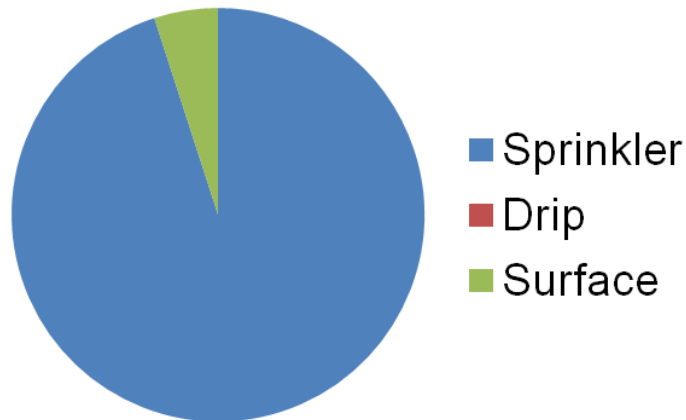
Cimarron



Beaver



Texas



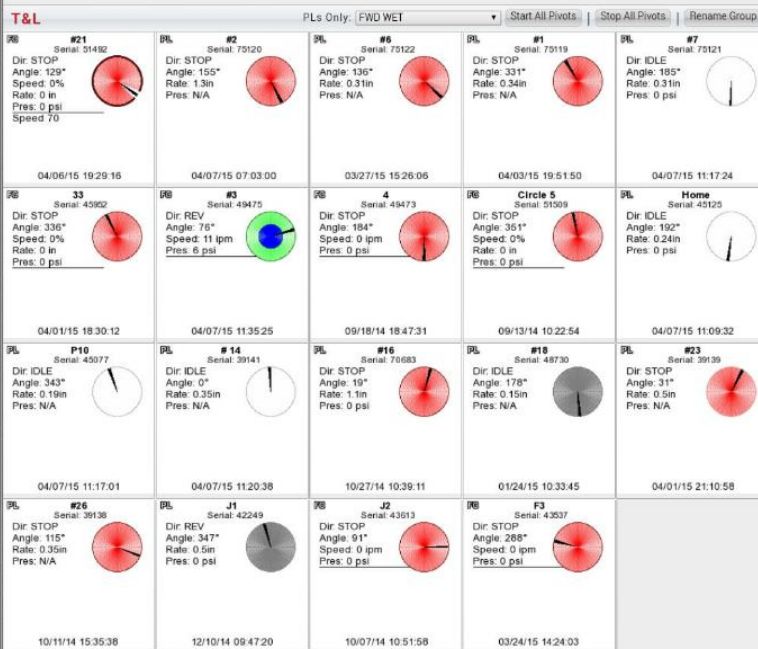
Method	Field Application Efficiency
Surface	64%
Sprinkler	85%
Drip	89%

To create a new group, simply drag a unit to the **New Group** section at the bottom of list view. If you have a lot of units and do not want to scroll, you can (while dragging the unit) press the **End** key on your keyboard to skip straight to the bottom of the page.

Field Commander Summaries

Start Date / / 2015 : Stop Date / / 2015 :

Depending on the number of Field Commander units you have, the PDF and CSV files could take some time to load.

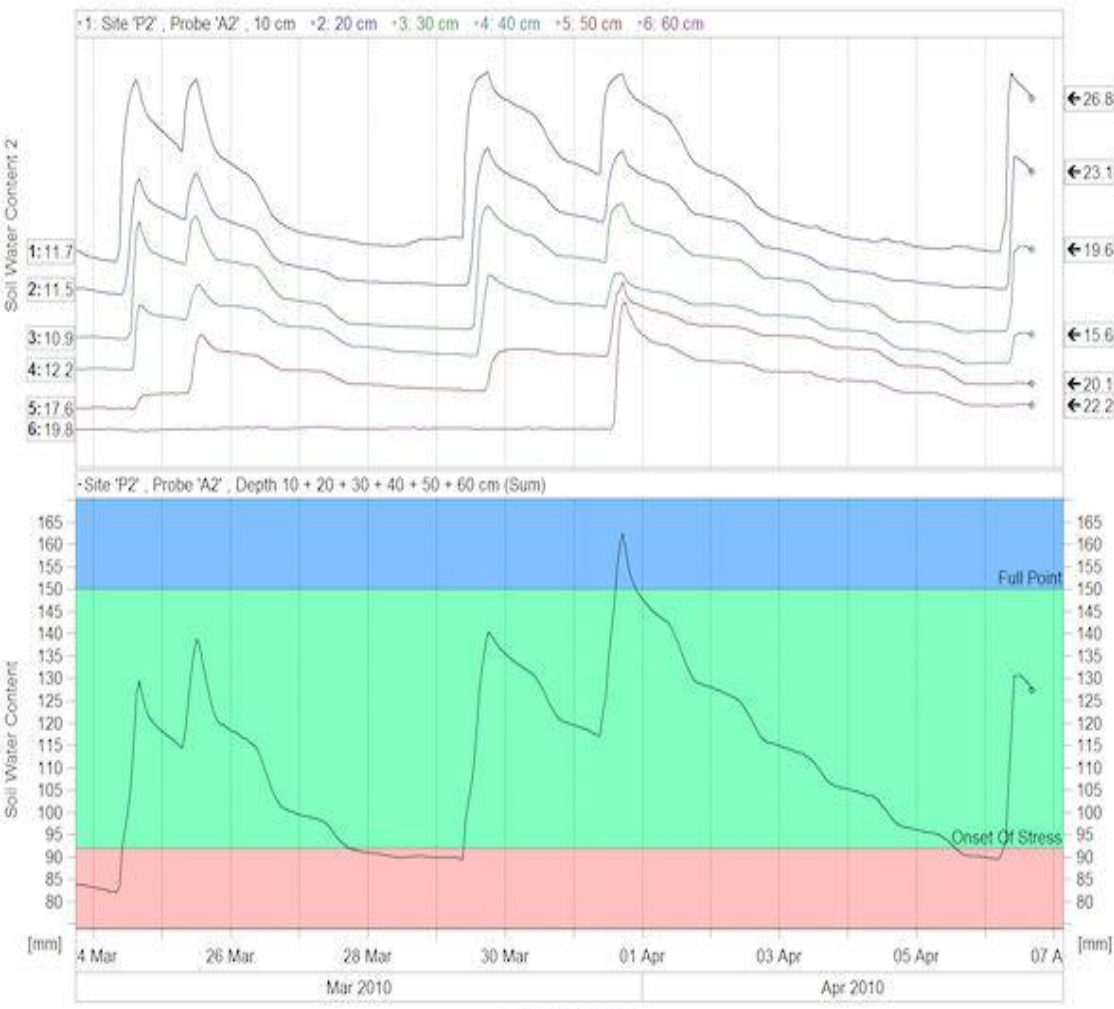


New Group Drag units here to create a new group

How has technology helped us?

- ▶ Telemetry enables growers to monitor and control irrigation application from mobile devices thus preventing wasting of water.
- ▶ Soil moisture probes help growers make irrigation timing decisions.
- ▶ Variable Rate Irrigation utilizes GPS to apply varying rates of water throughout a field, applying more water to drier areas and less water to wetter areas.

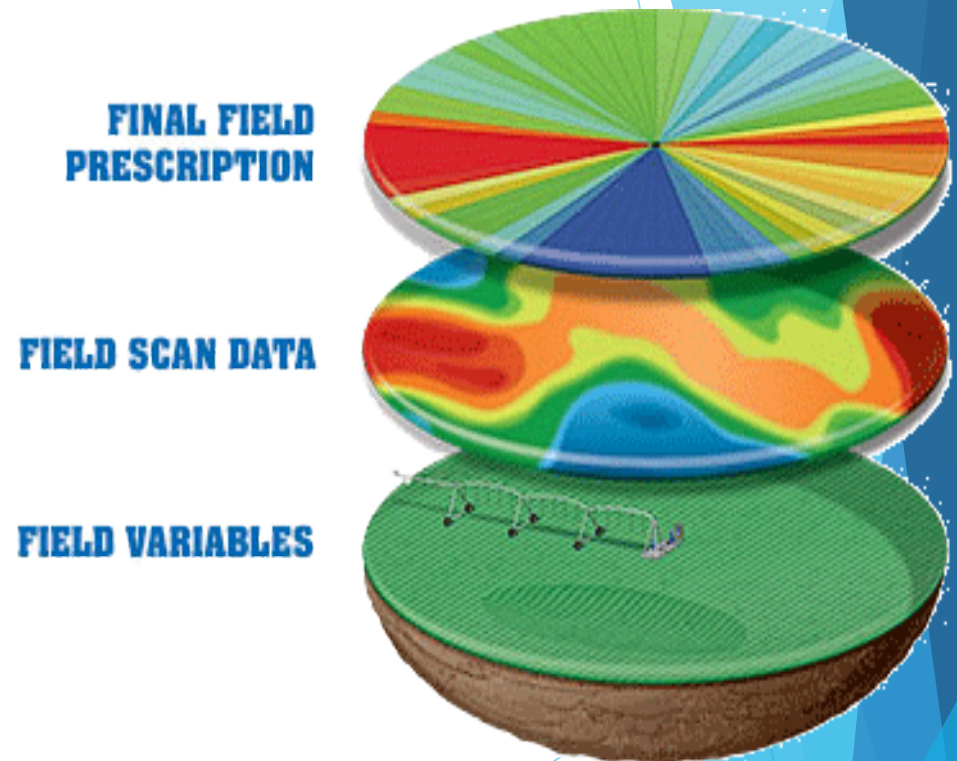
Remote monitoring of soil moisture



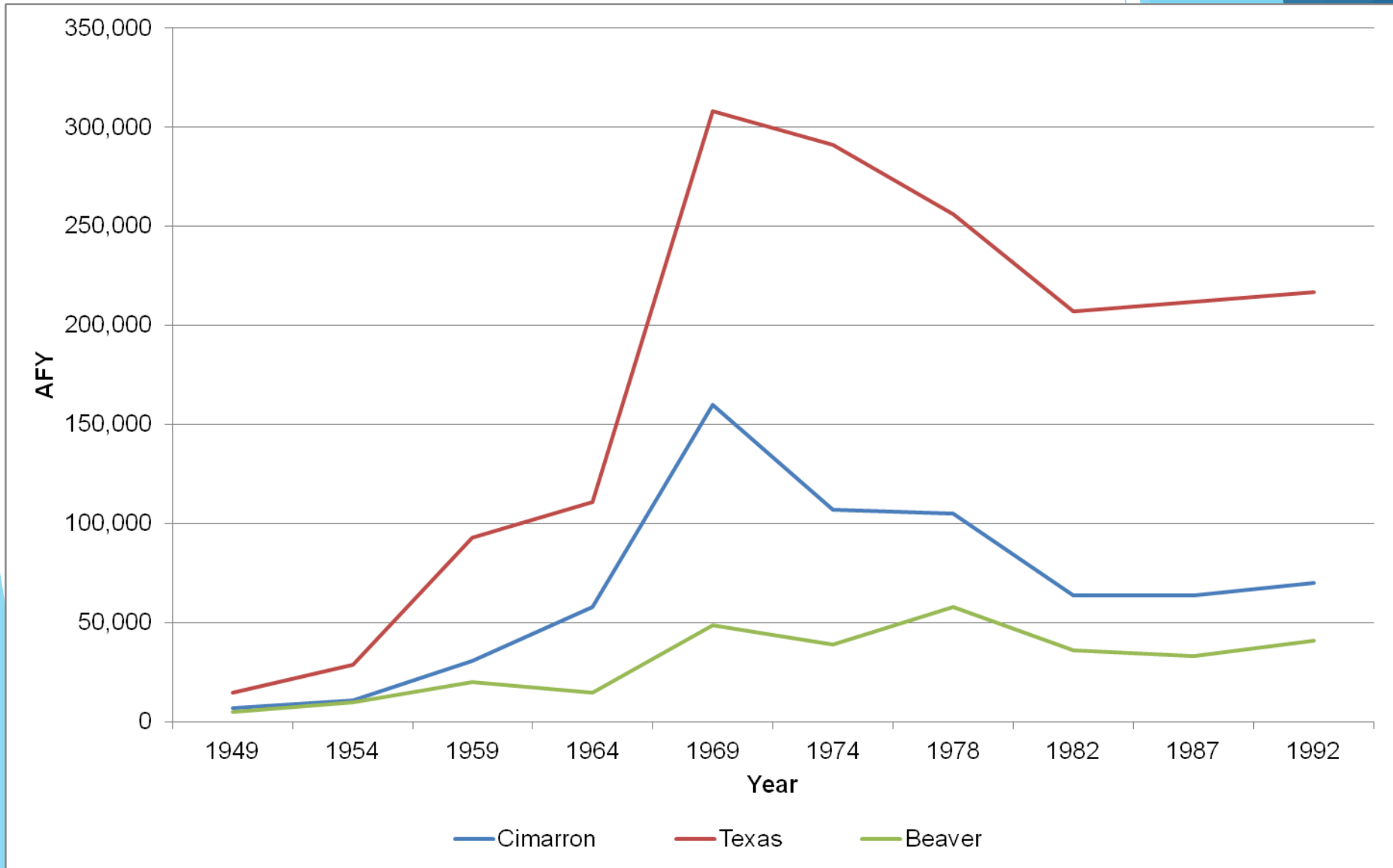
- ▶ Soil moisture monitoring probes are installed in a field and use telemetry to send real time readings to the grower.
- ▶ Probes collect data every 4” down to 48”
- ▶ Data helps to make irrigation decisions such as the amount of water to apply and the timing of irrigation.

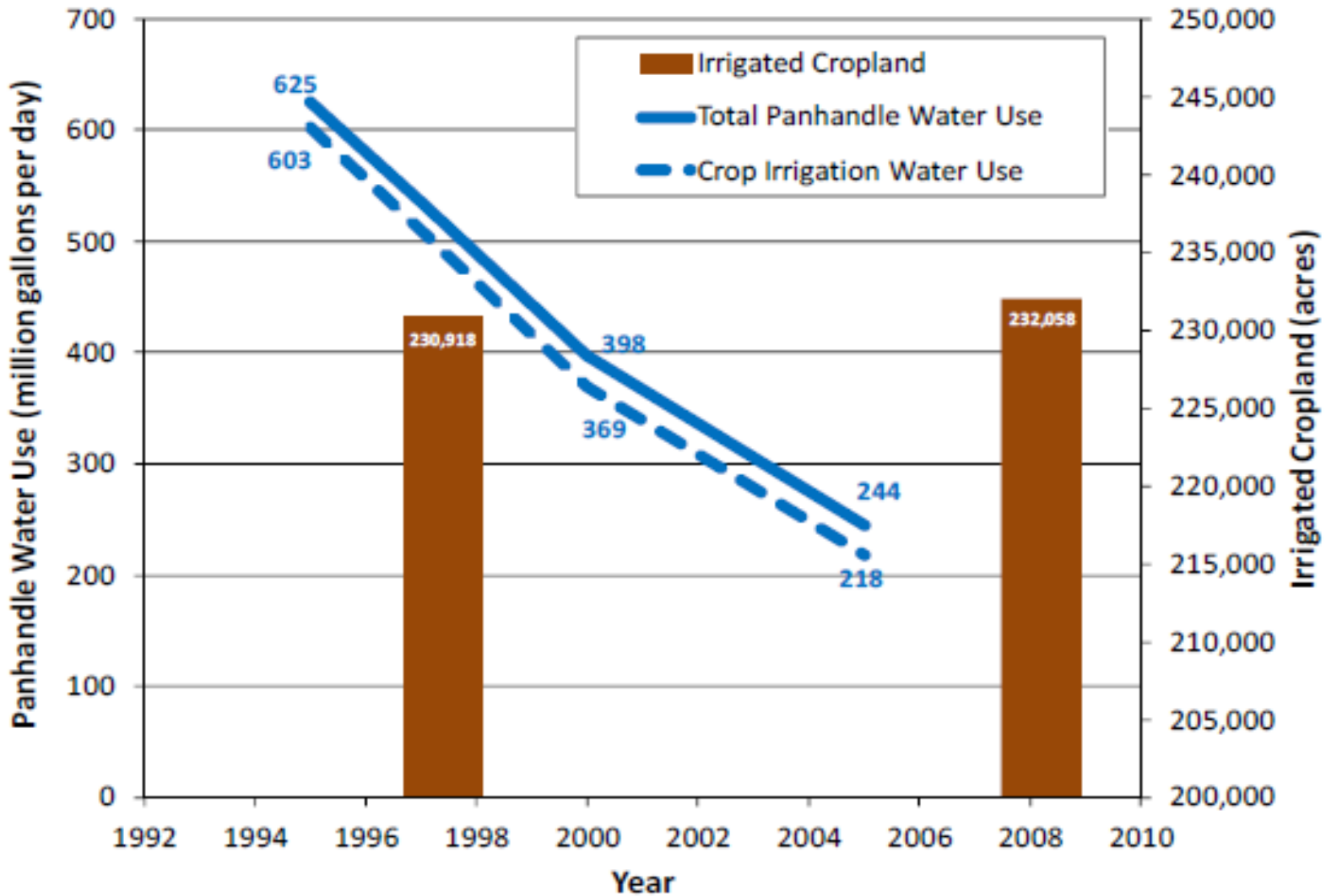
VRI—variable rate irrigation: the future?

- ▶ The newest technology in pivot irrigation
- ▶ GPS is used to make “prescriptions”
- ▶ These prescriptions are then used to control irrigation amounts by turning individual nozzles on and off.
- ▶ This results in the “right amount of water being applied in the right spot”.

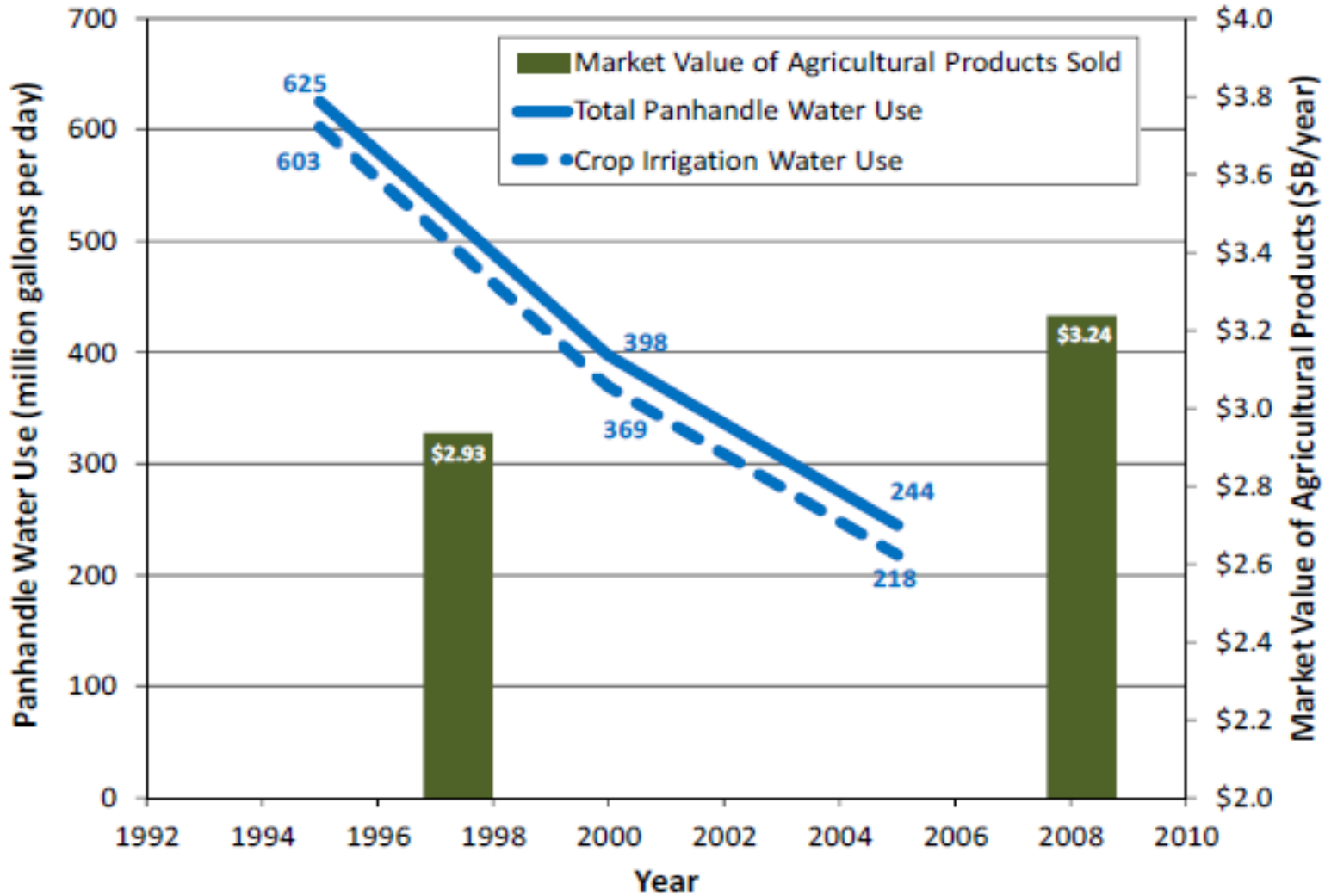


Historic Ogallala Aquifer Water Use





**WATER USE AND IRRIGATED CROPLAND IN THE PANHANDLE
(USGS 1995, 2000, 2009; CENSUS OF AGRICULTURE 1997-2007)**



WATER USE AND MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD IN THE PANHANDLE (USGS 1995, 2000, 2009; CENSUS OF AGRICULTURE 1997-2007)