Precision Agriculture

- Precision Agriculture is a technology solution that transforms the crop production cycle, driving efficiency, sustainability and profitability, while protecting the environment.

- Using precisely the right amount, in the right place, at the right time.
Trimble Perspective

Intelligent equipment

Aerial imagery

Global positioning

Managing resources

Inches

Feet

Miles
Market Drivers for Water Solutions

- Food security threatened by water scarcity and population growth
- The need to increase farm income with the same or restricted amounts of water
- Regulation will continue to drive down irrigation water availability to farmers
- Water Quality is impacted by farm conservation practices
- Global weather patterns are less dependable
Water Scarcity

- The volume of fresh water on the planet is finite
- Agriculture uses 70% of the world's fresh water
- The volumetric water requirements across all sectors is increasing
- Urbanization and industrialization providing agriculture with more competition
- 47% of the world's population could be living under severe water stress by 2050
Overwatering decreases yield
Crop production with VRI shown to increase by 15%
Non-watering of low production soil – redistribution of water
Cost of water increasing
- 30% increase in US between 2003 and 2008
- Number of US farms with no water cost decreased 5% between 2003 and 2008
Change in Water Regulation

- Freshwater regulations worldwide are becoming more stringent.
- Jurisdictions in many countries are restructuring freshwater subsidies.
- Regulatory efforts are increasingly focusing on watershed-based management approaches.
  - In California
    - Healdsburg reclaimed wastewater used for vines
    - Project to reverse aquaduct flow from Bakersfield to Kettleman City
Water for Conservation

- Farm conservation practices focus on soil erosion
  - Terraces, ponds, sub-irrigation, wetlands, waterways, buffer strips...
- Farming practices impact both surface and ground water quality
- NRCS cost share funding available to farmers utilizing soil and water conservation practices (EQIP)
Unpredictable Weather

CALIFORNIA

- Drought
  - 2014 California’s coverage of extreme to exceptional drought (D3/ D4) increased from 69 to 77% at end of April

UNITED STATES

- Drought
  - 2012 US drought dropped the Ogallala aquifer in Kansas by 4.25’ on average; in some locations by 30’
  - 2012 US drought cost $35 billion
- Rain
  - April 2011 in the US midwest rainfall was four times normal
Unpredictable Weather

OUTSIDE UNITED STATES

▪ Drought
  – 2000-2010 Murray-Darling drought in Australia saw water storage down to 32%
    ▪ Widespread flooding in 2010 bought storage back to 81%

▪ Rain
  – 2000 – Mozambique flood caused the loss of 1400 sq km of arable land
  – 2002 European floods saw similar damages
  – 2004 Boscastle flood in England decimated the pea crop
Irrigation

- Remotely control linear and pivot

Benefits
- Nozzle by nozzle control for Variable Rate
- Apply the right amount of water in the right place
- Apply water by specific crop requirements
- Optimize water usage
Connected Farm™ Dashboard

RainWave Point(s)
Drainage

AUTOMATED MACHINE GUIDANCE

SUB-SURFACE DRAINAGE SOLUTION

WATERSHED ANALYSIS

OFFICE-TO-VEHICLE COMMUNICATIONS

SURFACE DRAINAGE SOLUTION

WM-TOPO™ SYSTEM
Data Driven Solutions

- Rainfall
- Topography
- Soil characteristics
- Tile location and depth
- Irrigator configuration
- Yield Map
- Aerial imagery
- NDVI
- Crop type and population

Irrigation Prescription
Sustainable Food for a Population

- Precision agriculture reduces over-application and provides tools to manage natural resources and support sustainable farming.
Thank You