Same Goals-New Names
Fertility Programs, Soil Health, and Water Quality
Today’s Presentation

• Challenges our industry faces today
  – Are they really challenges at all?
• on the interaction between Fertility Programs, Soil Health and Water Quality
• Soil Health
  – Benefits
  – Management Requirements
• Water Quality
  – Importance
  – Potential impact on our industry
• Fertility Programs
  – What we do right
  – What needs to improve
• Where do we go from here?
Challenges We Face

Feeding The World Sustainably as the Population Reaches 9 Billion
### Consumer Preferences
- Shifting Demographics
- Environmental awareness
- Desire for more information about where their food comes from.

### Environmental Pressures
- Sustainability
- Assurance Standards
- Traceability and data management.
- Soil Health and Water Quality

### Economic Pressures
- Reduced Farm Margins
- Increased Competition
- Need for new metrics to determine farm Sustainability

### Opportunities

#### Increasing Awareness
- Community Involvement
- Environmental Focus
- Increasing the ability for our growers to derive value from sustainability.

#### Emerging Technologies
- Biotechnology
- Applied data technology
- Revolution of services, that focus on operational efficiency and sustainability

#### Record Keeping
- Data collection and storage
- Growing need for info on resource management
- Reliance on a trusted advisor to help in a changing system
Soil Health

• Objectives today are no different than when the original No-Till movement started.
  • Increasing soil OM
  • Improving soil structure and stability
  • Increasing soil biological activity
• Focus has shifted
  • From No-Till to Cover Crops
  • Improving Biological, Physical and Chemical soil properties.
• Unproven or Unpredictable Yield benefits
  • No Standard Metric
    • Haney test
    • PFLA
    • Cornell Soil Health Assessment
• Work Needed in Calibration & Correlation
• Added Management
  • Species Selection
  • Nutrient Needs
  • Termination
Soil Health

**PHYSICAL**
- Soil type
- Good structure & aeration
- Water infiltration & retention

**CHEMICAL**
- Available nutrition
- Optimal pH
- Low levels of toxicity

**BIOLOGICAL**
- Diversity
- Nutrient cycling
- Low pest numbers and ability to suppress disease

**SOIL HEALTH**
Water Quality

Areas at risk of nitrate contamination to shallow groundwater

Most Recent Nitrate-N Concentrations

Figure 11: Most recent recorded Nitrate-N concentrations of 20,306 wells from 1994-2014. (Source: Quality-Assessed Agricultural Databases for Nebraska Groundwater, 2015) Empty areas indicate no data reported, not the absence of nitrate in groundwater.
Water Quality Improvement Strategies

- Take a look at edge of field measures
  - Wood Chip Bioreactors
  - Native Grass Filter Strips
    - Associated costs are high
- Improvements in soil health
  - Recovery of leachable nutrients
    - Nitrogen
    - Potassium
  - Stabilization of soil aggregates
    - Reduction in runoff and soil erosion
- Implementation of 4R Strategies
  - Right Rate
  - Right Source
  - Right Placement
  - Right Timing
Fertility Programs
New Challenges In Soil Fertility

• Increased Scrutiny
  – Growers watching costs
  – Others watching growers
• Increased Needs
  – Soil P levels still dropping at an alarming rate
  – Increasing Crop Removals
• Cover Crops will Increase Complexities
  – Understanding mineralization
  – Replacement of Nutrients used by a cover crop
• The Water Quality Issues will not go away
  – NRCS Study on the Ogalla Aquifer
  – Des Moines Water Works
  – Great Lakes Algae Issues
• Distractions and Confusion
  – New Players in the game
  – Transitioning Farms
“We have the **KNOWLEDGE** and **TECHNOLOGY** to improve how we do things, let’s **DO** it” – Randy Uhrmacher Farmer near Hastings Ne
Summary

• None of these challenges are new, they just have more weight than in the past.
• Data and Technology will only take us so far
  – Strong Agronomics will be a MUST
• Complex problems NEVER have simple solutions
  – This is when the good Trusted Advisors get closer to their growers
  – Embrace the Complexity
• Fertility Programs, Soil Health and Water Quality are deeply interconnected
• Focus on the 4R Principles
  – Every Decision is a 4R Decision
Thank You

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