Continuous Improvement
Agricultural Production

- Human Resources
- Seed Genetics
- Fertility
- Crop Protection Products
- Equipment
- Soil Resources
Human Resources

- University Education/Research
- ARS Research
- Science Based Conferences
- Webinars
- Journals and Publications
- Certified Crop Advisors
Seed - Genetics

- Plant genome mapping
- Plant Breeding, GMOs
- Testing
  - Germination
  - Yield
- Field Days
Fertility

- Soil Testing
- Nutrient Management Planning
- Four Rs
  - Source
  - Rate
  - Timing
  - Placement
- Manure Utilization
Crop Protection Products

- Pesticides
  - GMOs
  - Modes of Action
  - Scouting and IPM
  - Product Labels
    - Effective
    - Safety
    - Environmental protection
Equipment
Equipment
Equipment
Soil Resources

We can’t make the same claim that over the last

10, 20, 50 150 years

Can we see improvement in our soil resources
Clarion Soil

A1: 7-12 inches
very dark brown loam

A2: 12-18 inches
dark brown loam

Bw1: 18-26 inches
dark yellowish brown loam

Bw2: 26-36 inches
dark yellowish brown loam
Clarion Soil
Soil Resources

- We measure erosion phases
- Color changes – reduced soil carbon
- Soil accumulation – down gradient
- Tolerable soil loss
Soil Resources

If we are honest with ourselves:

• 150 years of cultivation has taken a toll on Iowa’s soil resources

• The original soil characteristics of Iowa soils are undeniably more productive than current conditions
Soil Resources

• Conservation practices have offered some measure of protection
Soil Resources

• Conservation practices have offered some measure of protection

• To meet future demands for food, fuel, fiber, and forage – we need to protect restore Iowa soils
Cover Crops

- Prevent erosion – as a part of a conservation plan
  - Keep it green
  - Maintain more residue following harvest, through planting

- Without taking our cropland out of production
Cover Crops

• Restore soil properties - roots
  – Build soil organic matter
  – Improve soil structure
    • Permeability
    • Moisture holding capacity
    • Reduce compaction
    • Soil biology

• Increase soil/crop resilience
Cover Crop Cropping System

- Not without challenges
  - Weather limitations
  - Labor/equipment
  - Support services
    - Growing agribusiness products/services
  - Learning curve
    - Field days
    - Farmer to farmer
  - Cost/economics
Continuous Improvement

We have to manage our soil resource as if it is the most important crop production asset we have

Restore soil properties
Continuous Improvement
Agricultural Production

• Human Resources
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• Soil Resources
Soil Science

• Develop 5-year Research Plan
  – Address the problem of depleted soils
  – National effort to restore soils

• Cover Crops Research Initiative
  – Varieties/cultivars
  – Long term change in soil properties
  – Economics

• Look for a Better Way