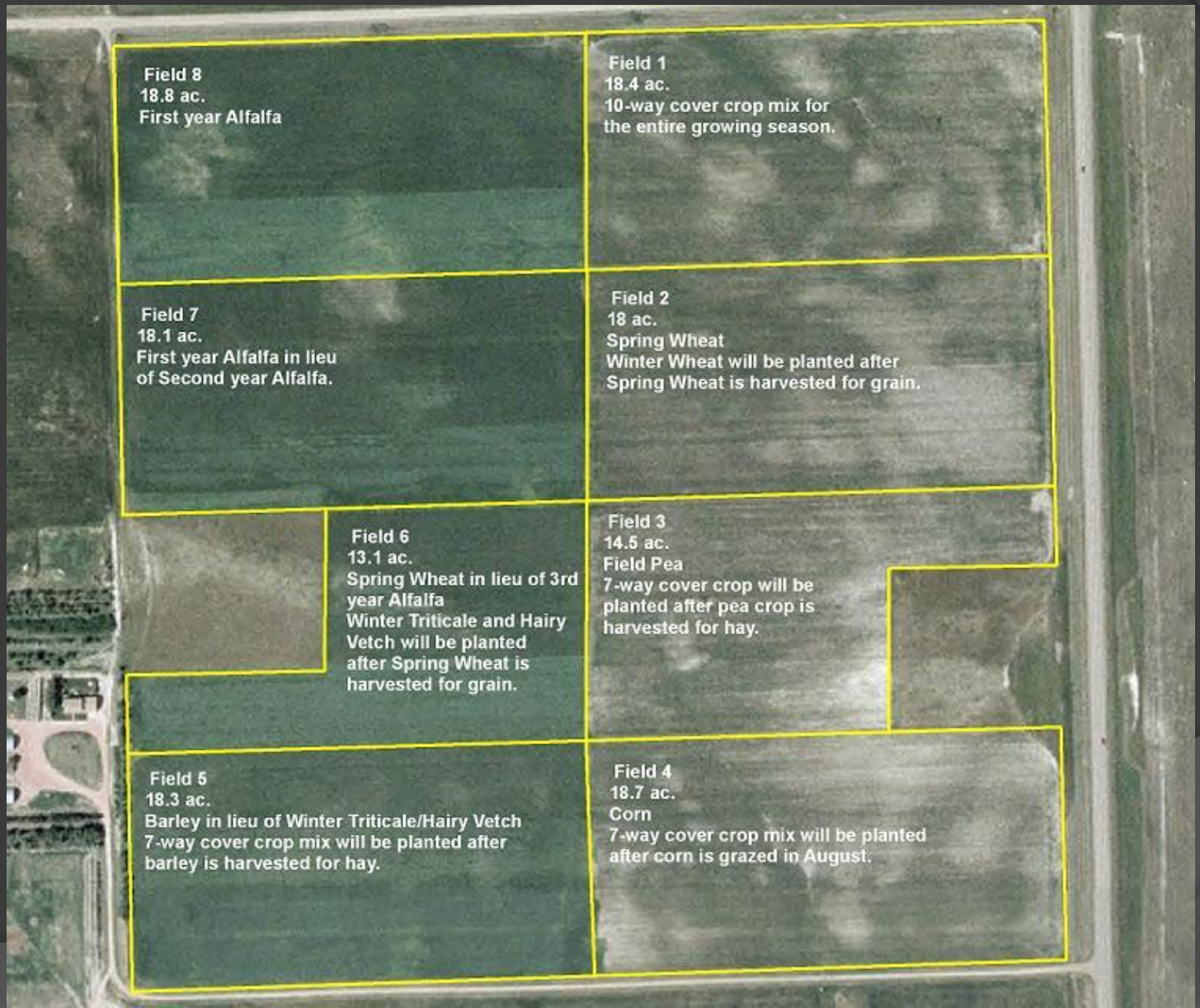
Southwest North Dakota Soil Health Demonstration Project

- To illustrate how no tillage and a diverse crop rotation including cover crops will improve soil health. Established 2008.

The Soil Health Demonstration site is located on the NE 1/4 of Section 24 T143N R96W Dunn County, North Dakota of the Dickinson Research and Extension Center two miles south of Manning, ND.



Range of Selected Benchmark Soil properties (0-5cm)

- Soil texture of fine sandy loam to silty clay
- Soil Organic Matter 2.3% to 3.0%
- Water infiltration rate 1.33 to 1.62 in/hr
- Soil Bulk density 1.43 to 1.67 gr/cc
- Electrical Conductivity .43 to 1.06 dS/m

Sampling/Testing

- Soil Food Web analysis
- Standard soil tests (NDSU or Agvise)
- Soil Quality test kit

Soil Changes from 2008 to 2011

Averaged across all eight fields 0-5 cm

(range of values measured)

- Organic Matter increased .06% (2.3% to 3.0%)
- Electrical Conductivity decreased .23 dS/m (.43 to 1.06 dS/m)
- Amoebate Protozoa increased 7,727 (no/gr) (5,000-30,000)
- Ciliate Protozoa decreased 12.4 (no/gr) (0-150)
- Total Nematodes decreased 4.9 (no./gr) (0-16)
- Spp. of Bacterial Feeding Nematodes increased 1.25 (2-6)
- Spp. of Fungal Feeding Nematodes increased 2.25 (0-5)
- Spp. of Fungal/Root Feeding Nematodes increased by 1.0 (2-5)
- Spp. of Root Feeding Nematodes decreased by .25 (0-3)

Changes in Protozoa relative to plant species diversity (2008-2011)

- 12 or more species of plants on a field
  - Amoebate protozoa increased an average of 25,994 per gram of soil. (5,000-32,000)
  - Flagellate protozoa increased an average of 3,378 per gram of soil. (500-15,000)
- 11 or fewer species of plants on a field
  - Amoebate protozoa declined an average of 3,232 per gram of soil. (5,000-32,000)
  - Flagellate protozoa declined an average of 7,085 per gram of soil. (500-15,000)

Observations to date (2011)

- Organic matter trending upward.
- Salinity trending downward.
- Amoebate Protozoa trending upward.
- Species diversity of Nematodes trending upward.
- Increased diversity of plant species resulting in greater protozoa numbers.
- Elimination of tillage and increase in plant diversity is having a positive affect on key soil physical and chemical properties and increasing the population and species diversity of key soil organisms.