Analysis of Key Soil Nutrients and Physical Properties on a Managed Grazing Operation in Junction City, WI

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Overview

- 20-year long-term study on a managed grazing farm in Junction City, WI containing a mixture of meadow fescue, rye grass, and red and white clover that was initiated in 2005
- Goal is to analyze and observe changes in soil health where rotational grazing takes place
- Sampling began in 2015. Samples are randomly selected from 5-acre grid and collected every 4 years

Project Goals

- Study the magnitude of the benefits of rotational grazing on soil nutrients, soil properties, and biomass production; through determining the Bulk Density, C:N ratio, total Carbon, total Nitrogen, total Phosphorus, total Potassium, pH, Electrical Conductivity, and Organic Matter
- Provide Soil and Water Conservation Society (SWCS) student members with research opportunities and field experience
- Connect SWCS members with agricultural-based networking opportunities through guest speakers and community members
- Encourage soil undergraduate students and students interested in soil to participate in research

Methods

- Bulk density
  - Core method
- Carbon-Nitrogen Ratio
  - Perkin Elmer C:N Analyzer
- Total Carbon-Nitrogen Ratio
  - Perkin Elmer C:N Analyzer
- pH
  - Electrical probe 1:2 Soil:Water
- Electrical Conductivity
  - Electrical probe 1:2 Soil:Water
- Total Potassium and Phosphorus
  - Melich-3 Extraction
- Organic Matter
  - Loss on Ignition

Results

Table 1. Averaged results of all 16 fields, including control field 16.

	2015	2019
Bulk Density (g/cm³)	1.11	1.05
C:N (%)	9.71	TBD
Total C (%)	3.68	TBD
Total N (%)	0.51	TBD
pH	6.11	6.51
Total P (ppm)	1.86	TBD
Total K (ppm)	8.22	TBD
EC (mS/cm)	0.22	TBD
OM (%)	6.82	6.80

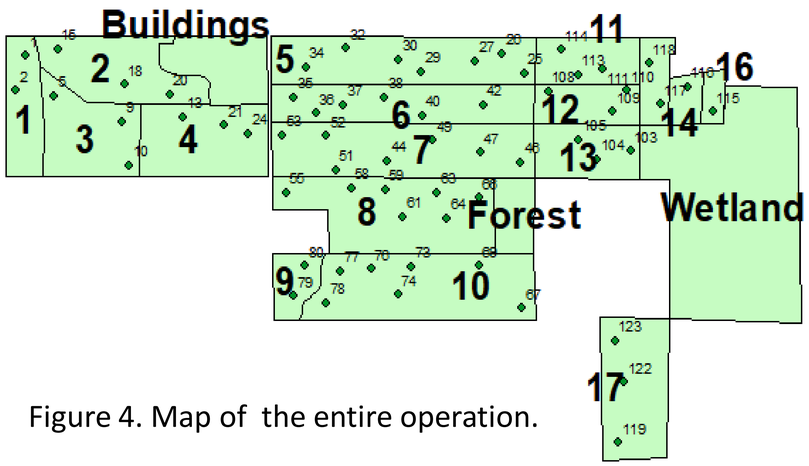

Figure 4. Map of the entire operation.

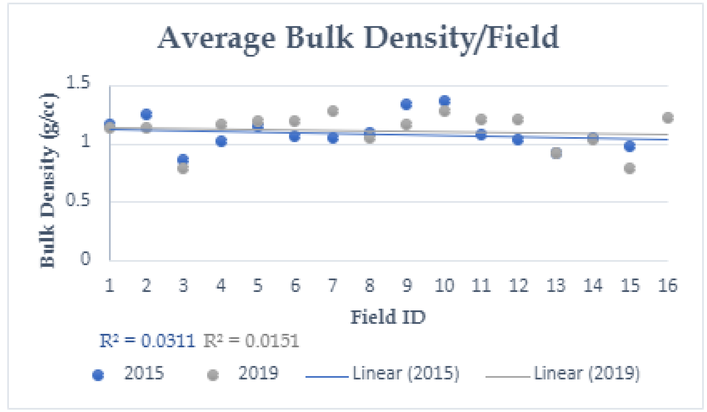

Figure 1. Average bulk density values for 2015 and 2019.

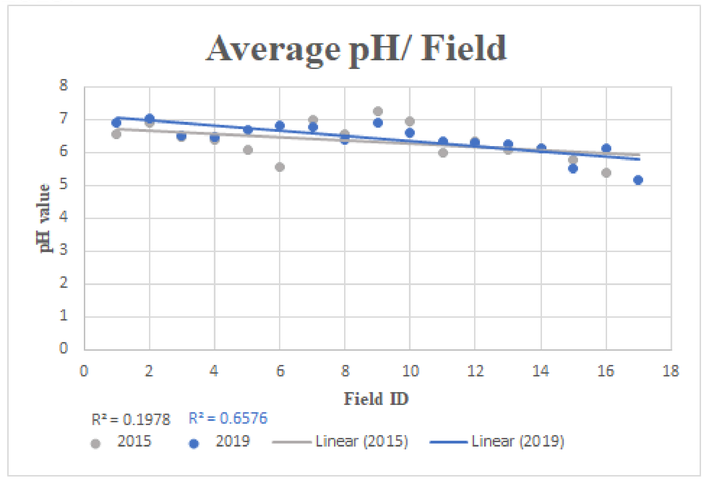

Figure 2. Average pH values for 2015 and 2019.

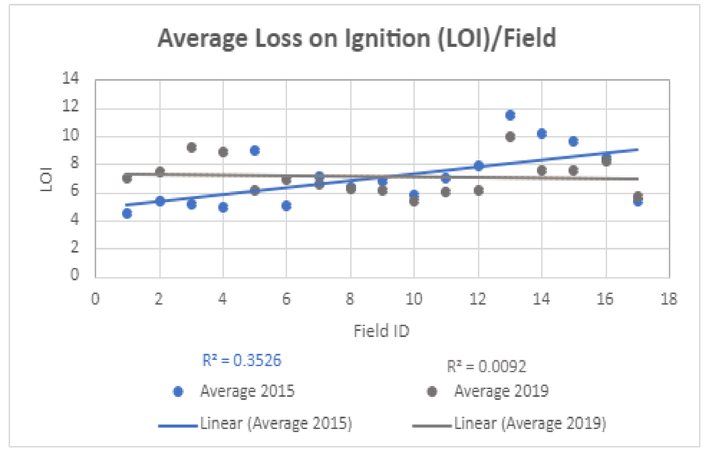

Figure 3. Average LOI for 2015 and 2019.

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