

Ohio Cover Crop Research Dr. Rafiq Islam James J. Hoorman Alan P. Sundermeier Ohio State University Extension

EMPOWERMENT THROUGH EDUCATION







Mixed cover crops





Decay Curve for Active Pool of Soil Organic Matter (SOM)





Islam et al. (2013)

We found **Zeolite** (soil amendment):

Calcium-Aluminum-Silicate

- Increased ion exchange capacity
- Adsorbed NH_4^+ , $H_2PO_4^-$, and HPO_4^{-2}
- Reduced reactive N (NO₃-) formation

 $\begin{array}{l} \mathsf{CO}(\mathsf{NH}_2)_2 \dashrightarrow \to \mathsf{NH4^+} \dashrightarrow \mathsf{X} \to \mathsf{NO}_3^- \\ \mathsf{NH}_4\mathsf{NO}_3^- \dashrightarrow \to \mathsf{NH4^+} \dashrightarrow \mathsf{X} \to \mathsf{NO}_3^- \\ \mathsf{Manure} \dashrightarrow \to \mathsf{NH4^+} \dashrightarrow \mathsf{X} \to \mathsf{NO}_3^- \\ \mathsf{Cover\ crop} \dashrightarrow \mathsf{NH4^+} \dashrightarrow \mathsf{X} \to \mathsf{NO}_3^- \end{array}$

Acted as a controlled release fertilizer

Ramesh and Islam (2012)

Value of Soil Organic Matter

Assumptions: 2,000,000 pounds soil in top 6 inches 1% organic matter = 20,000# Nutrients: Nitrogen: 1000# * \$0.75/#N = \$750 Phosphorous: 100# * \$0.50/#P = \$50 Potassium: 100# * \$0.50/#K = \$50 Sulfur: 100# * \$0.50/#S = \$50 Carbon: 10,000# or 5 ton * \$?/Ton = \$0

Value of 1% SOM Nutrients/Acre = \$900

Original Jim Kinsella/Terry Taylor(2006)/revised Jim Hoorman (2011)

DAVID BRANDT'S CORN PLOTS



Major Educational Events In Ohio

Conservation Tillage Conference March 5-6th

Dave Brandt Cover Crop Workshop April 9-10th

Illinois SARE Soil Health Workshop May 14-16th

Five Grants (2-USDA, CERES, Corn Growers MI, USB)

EQIP Grants in Ohio



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Multiple species cover crops August 2, 2011

Plot #1 Pearl Millet -4# Sorghum sudan grass-4# Soybean-10# Cowpea-15# Tillage radish-2# Turnip- 1# Sunflower -1# Clover - 5#**Biomass** produced:

16,500 lbs

Sun hemp – 10#
Cowpea – 15#
Soybeans – 10#
Pearl millet – 8#
Tillage radish – 2#
Turnip – 1#
Sunflower -1#
Ryegrass – 5#
Sweet clover – 2#
Biomass produced:
14, 020 lbs

11,580 lbs

Plot#4

Sun hemp -10#Cowpea -10#Tillage radish – 2# Tritcal – 30# Pearl millet – 8# Ethiopian cabbage – 2# Soybeans – 15# Buck wheat -5#

Biomass produced:

11,220 lbs