Cover Crops and Nitrogen Fertilization Effects on Soil Aggregation and Carbon and Nitrogen Pools. (S03-sainju110241-Poster)

Authors:

- U.M.Sainju* - *Fort Valley State Univ., Fort Valley, GA*
- B.P.Singh - *Fort Valley State Univ., Fort Valley, GA*
- W.F.Whitehead - *Fort Valley State Univ., Fort Valley, GA*

Abstract:

The effects of legume and nonlegume cover crops and N fertilization (HN: 80-90 kg N ha-1 and FN: 160-180 kg N ha-1 for tomato and eggplant) on soil aggregation and concentrations of organic C, total N, potential C and N mineralization (PCM and PNM), microbial biomass C and N (MBC and MBN), and particulate organic C and N (POC and PON) in whole-soil and aggregates were compared. The amount of soil present in aggregates was greater with nonlegume and FN than with HN and legume cover crops in 2.00-0.85 mm size class. Organic C, PCM, and MBC in whole-soil were greater with nonlegume but MBN and PON were greater with legumes than in the control. Organic C and total N in aggregates were greater in 2.00-0.50 mm than in 4.75-2.00 or <0.25 mm size class but PNM and MBN were greater in <0.50 mm than in 4.75-2.00 mm. The POC in <0.85 mm was greater with nonlegume and PON in 2.00-0.85 mm was greater with legumes than with the control and N rates. Nonlegume may increase soil aggregation, microbial activities, and C sequestration but legumes may increase N mineralization compared with no cover crop. Nitrogen fertilization also may improve soil aggregation. Nitrogen mineralization and C and N sequestrations may be greater in aggregates <2.00 mm diameter.

Corresponding Author Information:

Upendra Sainju
Fort Valley State University
Agricultural Research Station
Fort Valley, GA 31030

phone: 478-825-6810
fax: 478-825-6376
e-mail: sainjuu@fvsu.edu

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