Interaction between Cover Crops and Tillage Systems Affects on Soil Nutrient Dynamics and Soil Livings in Upland Rice Cultivation. (S06-gu004522-Poster)

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Abstract:

Fall planted cover crops can conserve soil N, improve soil quality, and enhance activity of soil micro-livings. We investigated C and N dynamics, soil respiration, and micro-livings population in rice field following rye, crimson clover and fallow under the different tillage treatments (plow, rotary, and no-till). The cover crop N mineralization was strongly affected by cover crop species and tillage treatments. For plow and rotary, soil inorganic N showed higher concentration in May and Aug following crimson clover and rye respectively. For no-till, it peaked in Aug and Sep following crimson clover and rye respectively. Soil respiration showed higher value in plow and rotary plots than in no-till plots by 1 month after tilling, however it became higher in no-till plots than in plow and rotary plots after that. These results almost agreed with the trend of soil bacteria population. After rice harvest soil C in the no-till plots was higher at the depth of 0-7.5cm following rye comparing with other tillage treatments. In this research, there was not signifcant rice yield difference between cover crops and tillage treatments, however, no-till rye - rice system demonstrated high ability to remain soil C and enhance the activity of soil livings.

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