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The effect of liquid swine manure application rate on the production of green manure crops in paddy

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Abstract

The application of liquid swine manure to soil has been commonly reported to increase crop productivity by improving plant nutrient availability. This study was conducted to investigate the effect of liquid swine manure (LSM) application on yield of green manure crops in paddy. Three different application rates of LSM equivalent to 25%, 50%, and 75% of standard fertilization rate of P were applied to the paddy field after rice harvest, and two cover crops, hairy vetch (*Vicia villosa* Roth) and barley (*Hordeum vulgare* L.), were subsequently mix-seeded and cultivated. Plant height of barley was 7% higher in LSM P25% and LSM P50% compared to control treatment (no LSM application), while no significant difference was observed between LSM P75% and control. However, there were no significant differences in plant height of hairy vetch among treatments. Dry matter (DM) yield of green manure increased with LSM application rate, reaching a maximum at LSM P50% (38 and 17% yield increase over control for hairy vetch and barley, respectively), but it decreased at LSM P75% rate. Nitrogen production by green manure crops was the highest in LSM P50% treatment, where the amount of produced N was 57% higher than the optimum N fertilization level for rice (90kg N ha⁻¹). Excess green manure biomass above an optimum level can be removed and utilized either for incorporation into nearby cropland or for sale as fresh forage. Therefore, it is concluded that the application rate of LSM P50% is recommendable for the maximum biomass and nitrogen production from green manure crops in paddy.

Keywords: liquid swine manure, green manure crops, hairy vetch, barley

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