EFFECT OF DIFFERENT ORGANIC MANURES AND CHEMICAL FERTILIZERS ON NITROGEN,PHOSPHORUS AND POTASSIUM USE EFFICIENCY OF RED ONION GROWN IN REGOSOLS

By

PUNITHA PREMANANDARAJAH

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ABSTRACT

A field study was conducted to study the effect of three organic manures and chemical fertilizers on nitrogen, phosphorus and potassium use efficiency of red onion (Jaffna local) grown in regosols. The study was conducted at the Ramakrishna Mission farm, Kallady, Batticaloa during yala 1999.

The experiment was laid out in a strip plot design, replicated four times. Three different organic manures (cattle manure 10t/ha, poultry manure 10t/ha and straw 5t/ha) were tested at two levels of chemical fertilizers (recommended and half the recommended level) in a factorial experiment. A second cropping was repeated in the same plot without fertilizer addition to study the residual effect of organic manure in the sandy regosol and on plant growth. Laboratory experiment was also conducted to study the effect of organic manures on nutrient leaching from the soil.

The result showed that in both the croppings, poultry manure was more effective than cattle manure in increasing nitrogen, phosphorus and potassium uptake. In cattle manure treatment nitrogen and phosphorus uptake ranked second in both croppings, but potassium uptake ranked second and third in first and second cropping respectively. In straw treated plots the uptake of these nutrients was decreased in the first cropping, but was increased in the second cropping and ranked third in nitrogen and phosphorus uptake and second in potassium uptake.

In the first cropping, all the organic manures with recommended level of chemical fertilizer increased the nutrient uptake than with half the recommended level. But in second cropping the above combinations did not show any significant difference.

In both the croppings, organic manure addition increased the soil nitrogen, phosphorus and potassium content. Combination of organic manure and chemical fertilizer influenced the soil phosphorus content but not the nitrogen and potassium content.

Organic manure reduced nitrate leaching in both the croppings but the difference among treatments was not significant. Among organic manures, straw and poultry manure treated plots had more phosphate and potassium leaching respectively.

Nitrogen and potassium use efficiencies were higher in straw treatment (88%) and cattle manure treatment (89%) respectively. Straw treatment showed a negative value for phosphorus use efficiency (-87%). Nitrogen and phosphorus use efficiencies were lower in poultry manured plot (37% and 17% respectively) and potassium use efficiency was lower in straw treated plot (42%). In the first cropping only poultry and cattle manure increased the onion yield but in second cropping all the organic manures increased the onion yield. However, the yield was lower in second cropping than in the first. In both croppings, the combination of organic manure with recommended level of chemical fertilizer gave highest onion yield than half the level of combination.

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3. MATERIALS AND METHODS