



205/B

Effect of gliricidia green manure on soil chemical properties and the yield of Black Pepper (*Piper nigrum* L.) in the mid country intermediate zone of (IM1), Sri Lanka

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Black pepper (*piper nigrum* L.) is the second most important export agriculture crop among the spice crops grown throughout the wet and intermediate agro climatic zones in Sri Lanka. A field experiment was established at Wasnagama in mid country intermediate zone (IM1) of Sri Lanka to evaluate the effect of two rates (10 and 15kg/plant/year) of gliricidia green manure with zero, half and full doze of recommended level of inorganic fertilizer (200 N, 75 P₂O₅, 200 K₂O and 28 MgO g/plant/year) and control (no green manure and no inorganic fertilizer) on improvement of soil chemical properties and long term yield performances of pepper. There were no significant improvement in the yield of black pepper with application of gliricidia at the rate beyond 10kg/plant/year and application of inorganic fertilizer on yield beyond the half doze of recommended amount (100 N, 75 P₂O₅, 100 K₂O g/plant/year) of inorganic fertilizer. The collection of yield data from 2002(3rd year after planting) to 2008 (9th year after planting) showed, in all the years except 2002 (3rd year after planting) and 2004 (5th year after planting) highest yields were obtained in the treatment of 10 kg gliricidia with half doze of inorganic fertilizer. The application of 10 kg of gliricidia with the half doze of recommended amount of inorganic fertilizer has recorded the highest yields of 4732 kg/ha/year in 2003, 5409 kg/ha/year in 2005, 4897 kg/ha/year in 2006, 4569 kg/ha/year in 2007 and 2725 kg/ha/year in 2008. The highest cumulative yield of seven years also recorded in the treatment of 10 kg of gliricidia with the half doze of recommended amount of inorganic fertilizer. The highest soil organic carbon content of 2.50% was obtained in the treatment of application of 15 kg gliricidia with zero level of inorganic fertilizer. The highest total N content (0.19%) was recorded with application of 15 kg alone, while in control it was only 0.11%. Application of 10 kg gliricidia with half doze of inorganic fertilizer has recorded significantly high amount of available P (89 ppm) and exchangeable soil K content (779 mg/kg) compared to the control. The highest exchangeable soil Mg content was observed in the treatment of 10 kg gliricidia with half doze of inorganic fertilizer. Application of 10 kg of gliricidia with half doze of recommended level of inorganic fertilizer gives higher effectiveness in achieving higher sustainable yields as well as on build up of soil nutrient status in pepper.

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