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PERFORMANCE OF CHILLI (Capsicum annuum L.) GROWN IN A LATERITIC SOIL TREATED WITH FILTER-CAKE FROM A CANE SUGAR PROCESSING MILL AND SOME RESIDUAL EFFECTS ON SOIL

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ABSTRACT

Organic matter has been a critical determinant of fertility of mineral soils. A mineral soil that has been classified as infertile would usually contain very small amount of organic matter or none at all. To improve its physical and chemical properties, a soil is normally treated with organic wastes to increase its organic matter content. A study was carried out to assess the potential use of filter-cake, which is an organic waste from a cane sugar processing mill, as a soil ameliorant. It would determine the effects of various rates of filter-cake in combination with inorganic fertilizer (NPK Blue Special) on chilli (Capsicum annuum L.) grown in a lateritic soil, Terap Series, in UiTM Perlis farm.

The experiment was carried out from April 2003 to October 2003. The treatment plots were arranged according to the factorial split plot design. The main plot factor was NPK Blue Special with the application rates of 0, 750, 1,500 and 2,250 kg per ha. The sub-plot factor was filter-cake at the application rates of 0, 1,000, 2,000, 3,000 and 4,000 kg per ha. Filter-cake was manually applied to the seedbed as a basal dressing using the subsurface band application method before transplanting of seedlings. NPK Blue Special was applied as top dressing using band application method and split applications at two, five, eight and 11 weeks after transplanting.

The parameters of the study were yield components, plant biomass, plant heights, soil pH and nutrient elements in soil and leaves. For determinations of soil pH and nutrient contents, soil samples were taken before the application of filter-cake, after application of filter-cake and at the end of the cropping period. Leaf samples to determine the nutrient contents were taken at the end of cropping period. Heights of plants were measured at four, eight and 12 weeks after transplanting giving three measurements of heights. Crop yields were harvested beginning at eight weeks after transplanting at weekly intervals giving a total of eight harvests. Biomass data were recorded after the final round of harvest.

CHAPTER 1

INTRODUCTION

Man is constantly faced with the task of increasing agricultural food production because human population is growing at a considerably fast rate. During the period 1992-1998, Malaysia was confronted with economic and financial crises, high import bills on food and liberation of trade (Ministry of Agriculture, 1999). In view of this continuing pressure, the authority has placed a strong emphasis on agricultural food production to reduce food import bills and foreign exchange. Among the strategic actions to improve agricultural food sector, in particular the vegetable production, was to set up satellite vegetable production areas (Ministry of Agriculture, 1999). This strategy would improve productivity and the economic well beings of local farmers.

1.0 Background of Problems

Chilli (Capsicum annuum L.) is a popular vegetable crop in Malaysia. This is a high value crop, which brings good revenues to the farmers. Compared with many other vegetable crops, it has a higher commercial value. Chilli fetches a reasonably high ex-farm price of RM2.00 per kg (MARDI, 1998).

The annual consumption of chilli is around 33,300 mt against the annual production of 23,000 mt (Jabatan Pertanian Semenanjung Malaysia, 1998). To meet the deficit, Malaysia needs to import chilli products in the form of fresh chilli, dried chilli and chilli powder. The import bill of chilli products in 1992 was estimated at RM55 million (Jabatan Pertanian Semenanjung Malaysia, 1998). This shows that Malaysia has not been able to achieve self- sufficiency in the production of chilli.

Although the demand indicator shows a big opening and potentially high return from chilli farming, the total area under chilli cultivation does not show any significant