

SHORT NOTE

**COPPER DEFICIENCY SYMPTOMS IN PINEAPPLE CULTIVAR
MAURITIUS**

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RINGKASAN

Tanda-tanda kekurangan zat makanan mikro kuprum telah didapati apabila nenas kv *Mauritius* ditanam di atas tanah gambut dara. Kekurangan ini telah didapati berlaku ketika pokok masih kecil lagi (empat atau lima bulan setelah ditanam) dan taburan pokok kekurangan kuprum ini berbentuk 'sporadic'. Oleh itu, ladang nenas yang menunjukkan kekurangan kuprum yang tidak berapa teruk tidak akan menyebabkan kekurangan berat buah yang bermakna.

INTRODUCTION

The importance of copper was first shown in the growth and development of fungi and other micro-organisms and later in higher plants (HEWITT and SMITH, 1975). In the metabolism of plant, Cu is known to be associated with a number of metalloproteins such as ascorbic acid oxidase, laccase, plastocyanin, stercocyanin and tyrosinase (GAUCH, 1973). It has been suggested that Cu is also one of the metals responsible for light reaction in plants ARNON, (1949); GILBERT, (1950); OKOJIMA, *et al.*, (1975).

The deficiency symptoms of Cu in fruit trees include dark green colour of the leaves which later may develop inter-veinal mottling and necrosis. The main shoots may die and lateral buds grow out giving a 'witches broom' effect (HEWITT and SMITH, 1975). In cereal crops, Cu deficiency causes young leaves to become chlorotic and remain tightly rolled while the tips turn white and eventually collapse (CALDWELL, 1966; CHEW, *et al.*, 1978a; 1978b; 1979).

SYMPTOMS

Deficiency symptoms of Cu in pineapple cv *Mauritius* is very distinct when planted on virgin peat soils. It is observed to occur at an early stage of plant growth, four to five months after planting. The leaves of a

Cu-deficient are darker green in colour and waxy in appearance than leaves of a normal plant. There are very few trichomes (that give a powdery appearance to the leaf surface on both the upper and lower sides of the leaves) on both the upper and lower sides of the leaves. In less severe deficient plants, the growth in terms of plant height is not affected. However, in a severely affected plant it will result in stunted growth. This is mainly due to the tips of young leaves which become necrotic (*Plate 1*). Eventually, the stem apex may die. Sometimes, many new shoots may develop around the base of the dead apical point, thus, forming a tuft-like structure on top of the plant (*Plate 2*). If there is no regrowth of new shoots, the whole plant will turn brown and eventually die off.

Deficient Cu plants can still bear fruits when induced to flower with artificial flower inductants such as ethrel, calcium carbide or NAA pills. However, the fruits are generally small in size (0.3 kg – 0.5 kg) and tapering in shape. Similarly, the fruits has a waxy, dark green colour with little or total absence of trichomes on the fruit surface.

Due to the sporadic nature of distribution of Cu-deficient plants in the field, the mean fruit yield is generally not affected. A similar pattern of response was made by CALDWELL (1966) in wheat and KANAPATHY (1975) in maize plants cultivated on peat soils.

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Plate 1: Tips of young leaves showing necrosis.



Plate 2: Tuft-like structure on top of the plant.

SUMMARY

Deficiency symptoms of Cu were observed in pineapple cv *Mauritius* when planted on virgin peat soils. It occurred at the early stage of plant growth (fourth to fifth month of planting) and was sporadic in distribution. Hence, in a non-severe Cu-deficient field, the mean fruit yield was not affected.

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