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SYNOPSIS

Influence of potassium fertilizer on yield of upland kangkong (*Ipomoea aquatica* Forsk.)

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Abstract. In a greenhouse experiment, effects of potassium fertilization on yield and potassium content of kangkong (*Ipomoea aquatica* Forsk.) were investigated. Kangkong was either ratooned (ratoon method) or resown after harvesting whole plants (seed method).

Key words: kangkong, *Ipomoea aquatica*, leaf vegetable, potassium fertilization, yield, ratoon method.

Introduction. Kangkong, a popular leaf vegetable in Southeast Asia, has received little research attention. Information on effects of cultural practices, among which manuring, on quality and yield of kangkong is limited (Cornelis et al., 1985). In a

greenhouse experiment, carried out in the Netherlands, application of nitrogen gave higher yields, but also higher nitrate contents (Linnemann et al., 1986). The present study focussed on the effects of potassium fertilizer on yield of kangkong.

Material and method. The trial with upland kangkong cv. Large Leaf of the Known You Seed Company, Taiwan, was carried out in 1983 in a greenhouse of the Agricultural University at Swifterbant, the Netherlands. The soil mixture consisted of equal volumes of sand and peat. To this soil was applied: N 250 kg ha⁻¹ as ammonium nitrate limestone (NH₄NO₃ + CaCO₃, 26 % N); P₂O₅ 150 kg ha⁻¹ as triple superphosphate (46 % P₂O₅) and Mg 15 kg ha⁻¹ as magnesium sulphate (MgSO₄·7H₂O, 15 % MgO). Three levels of potassium fertilization were tested. In total, rates of K₂O were 100, 250 and 400 kg ha⁻¹ over the experimental period of 12 weeks. These amounts were applied as sulphate of potash (48 % K₂O) in four equal portions with intervals of three weeks, the first dose just before sowing.

Square planting at 10 cm gave a density of 100 per m². The crop was harvested either by ratooning (cutting plants ca 5 cm above soil surface) or by taking whole plants (cutting at ca 5 cm and uprooting the stubble) and resowing the cleared plots, here referred to as 'seed method'. At harvest, plants were weighed fresh and dry, and the number of stems per plant and leaves per stem were calculated. K analysis was performed at the Department of Soil Science and Plant Nutrition of the Agricultural University, Wageningen. After the last harvest, soil samples were analysed for their potassium content after extraction with HCl 0.1 mol l⁻¹. The computer package 'Genstat' was used for statistical analysis.

Results. The first harvest was at a crop height of 30 cm, five weeks after sowing. With the seed method, a second crop could be obtained within the trial period. However, by ratooning three crops were harvested, resulting in a considerably higher yield. Differences in total yield were not significant for potassium rates (Fig. 1). Average dry matter content was also not significantly influenced by potassium rates, nor were the mass ratios of leaves to stems, the number stems per plant, the number of leaves per plant, or the number of leaves per stem.

Average potassium content of leaf-blades and of stems plus petioles was significantly influenced by potassium rates at both cropping methods. For the ratoon crop the average potassium content in dry matter increased from 770 mmol kg⁻¹ at the lowest fertilization level to 1530 mmol kg⁻¹ at the highest level. With the seed method, an increase was found from 825 mmol kg⁻¹ at the lowest level to 1440 mmol kg⁻¹ at the highest level. The potassium content of stems plus petioles was more than twice as high as the potassium content of leaf-blades.

Conclusions. Of the plant characteristics measured, potassium rates did not have a significant effect on yield components of kangkong, but only on the potassium content of the plant material. Higher potassium rates gave higher contents in stems and leaves. Potassium contents of stems plus petioles were more than twice as high as the contents of leaf-blades. Hence, the increase in potassium contents of plant ma-

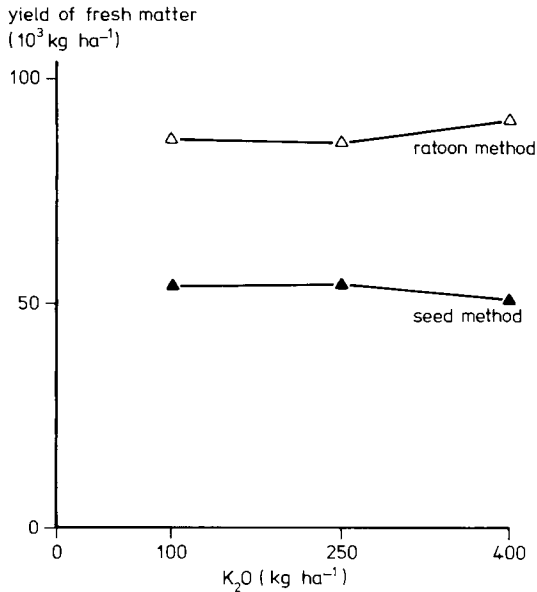


Fig. 1. Yield of fresh matter (10^3 kg ha^{-1}) for potassium rates (kg ha^{-1}) after 9 weeks for the seed method and after 12 weeks for the ratoon method.

terial at potassium rates above 100 kg ha^{-1} were so-called luxury consumption by the kangkong plants.

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