

EFFECT OF NITROGEN APPLICATION AND HARVESTING METHODS ON PLANT
GROWTH AND LEAF YIELD AND QUALITY OF VEGETABLE AMARANTH
(*Amaranthus hypochondriacus* L.). "

BY

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ABSTRACT

Two trials were carried out, one between March and May and the other between June and September, 1993, at the Field Station of the Faculty of Agriculture, Kabete Campus, University of Nairobi, to study the effect of nitrogen application on early plant growth and nitrogen application and harvesting methods on leaf yield and nutritional quality of vegetable amaranth (*Amaranthus hypochondriacus* L.). The amaranth plants were grown at nitrogen fertiliser levels of 0, 26, 52 and 78 kgN/ha and harvested either once-over by uprooting or fortnightly by cutting the tops at heights of 20 or 30 cm above the ground for eight weeks. Each trial was laid out in a split plot experimental design with three replicates. The main plots were nitrogen levels while subplots were the harvesting methods. Once-over harvesting was done 5 and 8 weeks after sowing in the first and second trials respectively. At the same time, the initial harvesting for the fortnightly harvesting was started.

Results showed that in early plant growing stages, plant height and number of leaves per plant in the first trial and number of primary branches per plant in the second trial were significantly increased by nitrogen application. In both trials, nitrogen application did not significantly affect leaf yield at once-over harvesting stage. In the fortnightly harvesting, cumulative leaf yield was significantly increased by nitrogen application in the first trial only. Harvesting

heights did not affect either leaf yield at each harvest or cumulative leaf yield in both trials. The interaction between nitrogen application and harvesting heights was not significant for either leaf yield at each harvest or cumulative leaf yield in both trials.

Nitrogen application did not affect leaf nutritive quality at once-over harvesting stage in both trials. However, results showed that in the fortnightly harvesting, harvesting heights, and not nitrogen application, significantly affected leaf levels of crude protein determined 7 and 11 weeks after sowing in the first trial and 10 and 14 weeks after sowing in the second trial, without showing any clearly defined response. Leaf fibre and soluble oxalates content determined at 12 weeks after sowing in the second trial were, however, significantly increased by harvesting heights. Harvesting heights significantly affected leaf levels of total phenolic compounds determined 7 weeks after sowing in the first trial, and in the second trial: nitrate-nitrogen and total phenolic compounds determined 14 weeks after sowing, also without any clearly defined response. The interaction between nitrogen application and harvesting heights was only significant for nitrate-nitrogen in leaves harvested 9 weeks after sowing in the first trial. Nitrate contents varied with nitrogen application rates but depended on the harvesting heights used.