ABSTRACT:

Agriculture in developing countries faces a number of pressing challenges including population growth, widespread poverty and food insecurity. Widespread poverty persists, contributing to severe malnutrition. This intolerable situation can be remedied in great measure by increasing production and consumption of traditional leafy vegetables (TLVs). The most commonly consumed TLVs in Kenya and most developing countries include the Amaranthus spp. (Pig weed), Vigna unguiculata (Cowpea leaves), Solanum nigrum (Black nightshade), Cleome gynandra (Cat’s whiskers), Cucurbita spp. (Pumpkin leaves) and Corchorus spp. (Jute). A market survey carried out in 31 major supermarkets and green grocers’ stores in the city of Nairobi found that the demand for TLVs was high. Of the TLVs, vegetable amaranth was the most preferred but had problems of a short shelf life and negative image of poor production practices. The distance from production sites to markets of the vegetables sold in Nairobi ranged between 20 and 40 km. These vegetables were found to contain reasonable amounts of proteins, ascorbic acid, zinc and iron. The levels of nitrates, oxalates and lead found in these vegetables were within safe limits allowed for human consumption, hence are of no public health concern. From the field experiments, Amaranthus hypochondriacus yields were significantly increased when N was supplied by a chemical fertilizer diammonium phosphate (DAP) but not when cattle manure was used. The yield increased with increasing levels of N from 0 – 40 kg N ha\(^{-1}\) but decreased at 60 kg N ha\(^{-1}\). However, leaf nitrate content increased between 0 – 60 kg N ha\(^{-1}\) with the highest amounts being recorded at the highest level of N in DAP. In addition, DAP at 60 kg N ha\(^{-1}\) led to the highest levels of beta carotene but with reduced ascorbic acid and total phenolic contents when compared to the other levels of N. DAP at 20 kg N ha\(^{-1}\) and use of cattle manure led to high amounts of ascorbic acid and total phenolic contents. During storage, the quality of the vegetables in terms of ascorbic acid, beta-carotene and total phenolics is maintained when stored at 4\(^{\circ}\)C for a period of 4 days. Gross margins calculated
using the yield obtained at 8 weeks after planting from both manure (40 kg N ha\(^{-1}\)) and DAP treated plots that received 40 kg N ha\(^{-1}\) demonstrated the feasibility of production of *A. hypochondriacus* as a commercial enterprise for small scale farmers. These gross margins were based on the small-scale farmers’ economic model of what they consider as ‘free’ resources. Overall the study shows that traditional leafy vegetables are sold in major supermarkets and green grocers in the city of Nairobi and are free of lead contamination hence safe for human consumption. It also demonstrates that *A. hypochondriacus* yields can be increased by using DAP fertilizer at 40 kg N ha\(^{-1}\). The vegetable is a valuable source of nutrients therefore can be used to reduce the malnutrition problems facing developing countries. As a commercial enterprise, *A. hypochondriacus* can be used to generate income that can be used to reduce poverty and food insecurity problems facing developing countries.

**KEYWORDS:** Traditional leafy vegetables, Amaranth, diammonium phosphate, manure, yields, nutrients, antinutrients, phenolics, oxalates, small-scale farmers, Kenya