



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:
conflicts, controversies and resolutions”

Improving Yield and Carotenoids of African Leafy Vegetables by Use of Agricultural Nets

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Abstract

African leafy vegetables (ALV) are not only important sources of minerals but also have medicinal values. However in the open field production, crops suffers from insect pest and diseases and unfavourable weather that severely reduce yield and quality. The present study aimed to evaluate the impact of agricultural nets (agronets) on yield and quality of ALV to ensure livelihood and food security, especially for urban and rural farmers. The ALVs used in the study were vegetable amaranth (*Amaranthus cruentus* L.), Ethiopian kale (*Brassica carinata* A. Braun) and Spider plant (*Gynandropsis gynandra* L). The ALVs were harvested 8 weeks after planting. The experiment was laid in a randomised complete block design with three replications. The treatments include ALVs covered with agronets and open treatments (control). The following parameters were analysed: total carotenoids, lutein, lycopene, β -carotene, chlorophyll a, chlorophyll b, as well as dry weight, whole plant fresh weight and leaf weight, leaf number and plant height. The results revealed that ALVs grown under agronets had significantly better growth and yield as indicated by more leaves with higher leaf area. The whole plant weight and dry weight was also promoted by agronets. Furthermore, agronets significantly improved carotenoid and chlorophyll contents in the three studied AVLs. Vegetable amaranth grown under agronets resulted to 34 % increase in total carotenoids, while chlorophyll a and b increased by 29.5 %. In Ethiopian kale grown under agronets an increase in chlorophyll b (90 %) was observed, whereas in covered spider plants the chlorophyll a content increased by 62 %. These findings not only show great potential for using agronets in the production of ALVs but also for improving their quality compounds which may in turn contribute to enhance food security for urban and rural African farmers

Keywords: African leafy vegetables, agronets, amaranth, carotenoids, chlorophyll, crop yield, quality