



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

The nutrient composition of leaves from multiple defoliated grain amaranth (*Amaranthus cruentus*)

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Abstract

Amaranthus spp. is an indigenous African vegetable with health promoting components that can be successfully cultivated for leaf or grain. A significant amount of work has been done on developing food products from grain amaranth. However, the leaves from the same plants remain an untapped resource as far as high value food products are concerned. In a dual-use production system where there is utilization of the leaves as well as seeds, nutritional and economic value can be enhanced. The aim of this study was to determine the nutrient and health promoting compound composition of the leaves from grain amaranth plants (*Amaranthus cruentus*) that had undergone multiple defoliation as is practised in a dual-use system. The study is part of the project “Inclusive nutrition-sensitive value chains in Kenya and Uganda – Upgrading strategies for underutilised horticultural crops (InNuSens)” which is funded by the German Federal Ministry of Education and Research (BMBF) and the German Academic Exchange Service (DAAD). *A. cruentus* seeds were grown under field conditions in Luwero district, Uganda in a randomized complete block design with four blocks. Treatments were based on timing and frequency of defoliation of leaves. Plants were defoliated by removing 50% of the leaves once at 3, 5, 7 and 9 weeks after sowing as well as defoliated twice consecutively using the same leaf harvest intensity at 5, 7 and 9 weeks after sowing. After harvesting, fresh leaves were analysed for β -carotene, total chlorophyll, protein, iron, zinc and calcium and furthermore for health promoting compounds such as phenolics and flavonoids contents. Plant height, dried plant biomass and grain yield at harvest were also measured. Results showed that the β -carotene content significantly increased with maturity stage while multiple defoliation had no significant effect on the same. The protein content remained stable regardless of defoliation frequency. Plant height and grain yield were not significantly affected by the timing and frequency of defoliation. Further results will be discussed in detail.

Keywords: *Amaranthus* spp., defoliation, dual-use, nutrient, phenolics