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"Solidarity in a competing world — fair use of resources"

Growth Response of Ethiopian Kale (*Brassica carinata*) and Spider Plant (*Gynandropsis gynandra*) to Mulching

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Abstract

Water shortage especially in the light of climate change is likely to limit crop production. Mitigation measures include growing crops that are adapted to low moisture such as African indigenous vegetables and use of water saving technologies such as mulching. Mulching reduces unproductive evaporation leading to reduced water loss and results in increased yields and quality of vegetables under limited moisture environment. A study was carried out from January to April 2016 in JKUAT farm in Juja, Kenya, to study the effect of mulching on growth and quality of Ethiopian kale and spider plant. Plants were grown under organic mulch, plastic mulch and no mulch replicated four times. Leaf length, plant height, shoot dry weight, root dry weight, leaf area index (LAI), leaf temperature and soil temperature measurements were measured. Data was subjected to analysis of variance and LSD used for means separation. Leaf expansion was characterised by an initial slow expansion rate followed by a fast expansion rate before leveling off with significant differences in effect of mulch for both vegetables ($p < 0.01$). There was a significant difference in plant height among the mulch type for Ethiopian kale ($p < 0.01$) and no significant difference for spider plant. The height of Ethiopian kale was 106 cm under organic mulch compared to 78 cm and 86 cm under polythene mulch and un-mulched respectively. The dry weights of shoots and roots, leaf area index and leaf temperature did not differ significantly among the mulch treatments in both vegetables. The soil temperature of organic mulch (22.7°C for kale and 24.1°C for spider plant) and plastic mulch (25.6°C and 27.9°C in Ethiopian kale and spider plant respectively) differed significantly ($p < 0.01$). The results showed that mulch type increases plants vegetative growth as a result of the temperature in the soil.

Keywords: Dry weight, leaf area index (LAI), leaf temperature, soil temperature, water

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