

Title: The effect of different forms of water hyacinth (*Eichhornia crassipes*) organic fertilizers on leaf growth rate and yield of rape (*Brassica napus*)

Author: Masaka J., Ndhlovu S.

Abstract

Although on-farm crop residues and animal manures proved the most widely used organic materials for intensive small-scale vegetable production by resource-poor smallholder farmers in southern African countries their availability has become limited. In an effort to establish alternative sources of organic materials for vegetable gardeners a soil fertility study was conducted at Masvingo Teachers' College (30°52' E; 20°07' E, elev. >1100 m above sea level) about 5.5 km southeast of Masvingo city in Zimbabwe. The experimental plots were laid out in a Complete Randomized Design with four replicates, which were subjected to three hyacinth-based organic matter treatments in order to determine the effect of these alternatives to crop residues on leaf growth rate and yield of vegetable rape. Our research results have conclusively shown that the use of water hyacinth as organic fertilizer significantly improved vegetable rape leaf length and yield. Vegetable rape leaves growing on crop stover-free hyacinth matter were 12.3-12.8 mm longer and had about 11.5-67.3% higher rape leaf yield than those in crop stover-based hyacinth compost matter. A vegetable rape yield gain of 1.8 t ha⁻¹ was recorded in plots subjected to green hyacinth matter soil treatment compared with rape yield in plots treated with hyacinth compost matter. The use of hyacinth matter significantly retards initial vegetable rape leaf growth rate by about 1.47-5.9% compared with that in the zero organic fertilizer control plots. Laboratory analysis of the two organic materials has shown that hyacinth compost matter was nutritionally inferior to green hyacinth manure. Total N content in the water hyacinth compost was about 72.6% less than that in the green hyacinth. This study has shown that, green hyacinth matter, an obnoxious water weed that greatly reduces the aesthetic quality of public water bodies, is an effective alternative crop residue-free organic fertilizer for small-scale vegetable production..