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## Influence of different oyster mushroom (*Pleurotus ostreatus*) substrates on the establishment and growth of three selected vegetables

Z E Nkosi and K Ramachela

North West University, South Africa

Spent mushroom substrate is the by-product of a growth media leftover after a mushroom crop has been harvested. It has the potential to improve the soil structure and nutrient content when used as compost. A pot experiment was carried out with an objective to investigate growth response of each of the 3 selected vegetable types to 4 types of oyster mushroom spent substrates. The experiment was laid out in a 4×1 single factor experiment per each vegetable namely: Carrot ( $V_1$ ), spinach ( $V_2$ ) and beetroot ( $V_3$ ), using a complete randomized design with 4 replicates. The 4 treatments were as follows: Liverseed grass ( $S_1$ ), maize straw ( $S_2$ ), maize cob ( $S_3$ ) and 100% soil ( $S_0$ ). Soil amendment was carried out in the proportion of 70% substrate:30% soil for each of the respective substrates. Seedlings growth response was evaluated with respect to emergency, number of leaves per plant, plant height and chlorophyll content index. First emergency for spinach ( $V_2$ ) and beetroot ( $V_3$ ) was observed on the 4th day after planting in all 4 growth media. Maize straw ( $S_2$ ) gave the highest emergency rate at 100% for the 2 vegetables and the lowest was observed in soil at 68% on day 14 after planting. Emergency of carrots was observed on the 2nd week after planting at a rate of 31% on all 4 growth media. Full emergency of 100% was recorded on the 4th week for only  $S_2$  followed by  $S_3$  at 94% and  $S_1$  at 81 and the lowest was recorded at 56% in  $S_0$  (control). As for plant height, 30 cm was recorded as the highest plant height for carrots growing in  $S_2$  and the lowest was recorded in soil at 6 cm long after 134 days. Furthermore, the highest plant height was observed on spinach planted in  $S_2$  at 19 cm in length and the lowest was 7.4 cm in soil after 155 days of growth. A similar trend was observed on beetroot grown in  $S_2$  with the highest height being 21 cm and the lowest was recorded in soil at 6 cm after 148 days of maturing. The highest number of leaves recorded per plant on spinach was 10. On beetroot 11 leaves per plant was recorded as the highest. The chlorophyll content of leaves is dependent on a number of factors; such as light intensity, temperature, age of leaf, availability of N, Fe, and Mg. An increase in chlorophyll content index means there is an increase or release of such trace elements in the soil by the substrates and these nutrients released are then taken up the plant for growth. A deficiency in either one of the above mentioned elements will cause a drastic decline in chlorophyll content index. Maximum chlorophyll content index for carrots was recorded at 3.8  $\mu\text{mol per m}_2$  of leaf in week 2 on  $S_3$  and the lowest was 1.8  $\mu\text{mol per m}_2$  in week 3 on  $S_2$ . 12.0  $\mu\text{mol per m}_2$  was the highest chlorophyll content recorded on spinach planted in  $S_3$  in week 1 and 4.4  $\mu\text{mol per m}_2$  was recorded as lowest on  $S_1$  in week 4. Furthermore, beetroot's highest chlorophyll content recorded was at 21  $\mu\text{mol per m}_2$  in week 1 on  $S_3$  and the lowest was 7.6  $\mu\text{mol per m}_2$  on liverseed grass ( $S_1$ ) in week 4.

### Biography

Z E Nkosi has completed her BSc in Crop Science in 2014. She currently enrolled for a Master's degree in Crop Science which she is expected to graduate in October 2016 at North West University. She also holds a Diploma in Plant Production which she obtained at Lowveld College of Agriculture in Mpumalanga. She has been in the agricultural field for about 8 years, hence her goal is to contribute at large in the Agricultural sector after she completes her studies. In addition, she is a student assistant at North West University where she carries out trials and helps in proposal and article writing for publication purposes.

[zuziwe.nkosil@gmail.com](mailto:zuziwe.nkosil@gmail.com)

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