YIELD IMPROVEMENT OF CAULIFLOWER GROWN IN SOILLESS CULTURE OF COCONUT COIR DUST

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Introduction

The coconut coir dust (CD), a biowaste from the coconut factory has been used commercially for horticultural crop production worldwide. Unlike peat, utilization of this material is considered environmental friendly and sustainable. In Holland, coconut dust is used as substitute for rockwool and peat culture due to the environmental problem created by the latter. The physical and chemical properties were reported suitable as the soilless culture material for crop production (Evans et al. 1996; Yahya and Mohd Razi, 1996). There is, however, limitation when only coconut coir dust used as growing substrate due to low organic matter. In practice, large volume of water and nutrient need to be added to the media particularly, at early establishment of crops. The objective of the investigation was to determine organic material source for incorporation into the cultivation slab of CD for yield improvement of cauliflower plants grown under lowland environment.

Materials and Methods

Local commercially produced coconut dust was used in the investigation. This coconut coir dust into a cultivation slab. Five different sources of organic matter were incorporated with the coconut dust in the cultivation slab to form 5 different media combination. The organic material used are i., composted rice straw, composted oil palm empty fruit bunch, animal wastes from slaughter house (AWSH), Rosameal^{Tr} mixed with coconut coir dust and compared with the used of coconut dust without additive. Cauliflower (*Brassica oleracea* var bortytis) seedlings were grown on each of the cultivation slab containing different media. The experiment was conducted in a completely randomised design with four replication. Growth, physiological processes and yield of plants grown in the treatments were recorded.

Results and Discussion

Fresh weight of curd was increased with incorporation of organic material, except for Rosameal ^{Tr} to the coconut dust. There was delayed in curd initiation of plants grown in CD mix with Rosameal^{Tr} due to the imbalance of dry matter partitioning between vegetative and reproductive parts of the plant. Leaf area formation was vigorous CD+Rosameal ^{TR} combination compared to other mixtures. Flowering was enhanced by 10 days when plants were grown in composted rice straw and EFB mix with CD as compared to the CD without additives. There was an increased in diameter of curd formed on plants grown in CD with additives of composted rice straw, EFB and AWSH. Adding AWSH , composted rice straw and EFB increased yield by 78%, 70% and 60% respectively, compared to the plants grown in CD without additives. Yield improvement for plants grown in CD with additives could be attributed to improved physical and chemical properties of the substrates. pH of the substrates was improved by adding additives to the CD. Similarly, improvement of crop growth can be attributed to better plant water status indicated by the stomatal conductance by adding additive to the CD measured throughout the growing period. Incorporation of composted organic wastes exhibited similar responses as observed by adding processed peat to CD (Mohd Razi et al. 1997). This substitution for peat can reduce production cost in cultivation of vegetables using soilless culture system.

Conclusions

This result suggests that growth and yield of cauliflower plants grown under lowland environment in Malaysia can be improved by adding additives to the CD soilless substrate. The benefit of incorporation of composted organic wastes includes improve water relation and plant nutrition.

References

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