

Response of Petunia to wood fibre amended peat substrate under ebb-and-flow irrigation

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The choice of substrate and irrigation play a pivotal role in determining the success of plant growth. Commonly used peat substrates have gained popularity for their excellent water retention and relatively good aeration properties. However, the peat substrate is a non-renewable and limited resource. Peat extraction from bog wetlands also causes several environmental concerns. As a result, recent research has focused on replacing peat by wood fibres. Yet, wood fibres are known to have a lower water storage capacity compared to peat which may need modifications in irrigation strategy.

The main objective of this study was to identify possible necessary changes to the irrigation strategy in Petunia production due to the use of wood fibres. An experimental plantation was carried out to investigate the impacts of substrate type, irrigation water level and the interaction between the two main factors. The experimental design comprised nine subplots, each with 30 plants: three soilless substrates (pure white peat, 50% untreated wood fibre x 50% peat, and 50% thermally treated wood fibre x 50% peat, and three ebb-flow water level treatments (1, 2, and 3cm irrigation depth).

Water level, substrate type and their interactions did not show significant effects on fresh weight and dry weight of the plants. Also, there was no significant effect of substrate type on plant height and flower number. However, the water level was statistically significant with respect to the plant height (3cm irrigation depth showed the highest plants) and the number of flowers (2cm irrigation depth showed the largest number of plant flowers).

In conclusion, the two and three-cm water levels (which is standard in ebb-and-flow irrigation) showed better performance than the one-cm treatment. Moreover, the addition of 50% wood fibre to peat had no negative effect on petunia production despite the different physical properties compared to peat.