

Use of the rice husk as an alternative substrate for growing media on green walls drip irrigation

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In the last years, we have been looking for alternatives to traditional growing mediums for green walls. Commercially available systems for green walls are commonly made with Sphagnum, rock wool or polymers that are unsustainable materials. In the design of the green wall, local components such as agricultural by-products should be considered more often.

The objective of this research is to use alternative materials available in Andalusia that are suitable for use as a growing medium in green walls, using organic residues generated by agriculture as in this case the rice husk, compared to conventional and used materials as a growing media in green walls such as coconut fiber and rock wool. The physical-chemical characteristics of the water were analyzed through the collection of excess irrigation water, after passing through the prototypes of green walls, installed in the Rabanales Campus of the University of Córdoba between April and July 2016 and thus observe the feasibility of using rice husk as an alternative material. The 16 mm diameter irrigation pipes are at the top and middle of each module, with 12 adjustable drippers of 4 l/h for each module, 72 drippers in the whole experimental green wall prototype installed at every 15 centimeters of tube. Two different species of plant material (*Lampranthus spectabilis*) and (*Lavandula stoechas*), were selected, taking into account the solar exposition of the place of establishment of the prototype of the green wall and the easy acquisition of these plants in the region.

Water samples were collected every day twice a day for 10 weeks of the experiment, taking a sample of the surplus runoff water from six green wall prototypes. PH 40 - pH - conductivity - TDS - temperature, CRISON. Differences in pH, electrical conductivity, turbidity and total solids of the treatments were examined by ANOVA with the test of normality and homogeneity of variances.

It was observed that the substrates used in the prototypes of the experiment with rock wool and coconut fiber had a significant influence on the water characteristics, while the effect of the rice husk substrate was minimal. These results confirm that the rice husk is a valid substitute for the conventional substrates used in green walls. The use of rice husk as a growing medium material can replace less sustainable substrates such as Sphagnum moss and other polymers.