

Evaluation of the performance of evaporation pans in greenhouse environment

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Abstract

The class A pan method has been one of the most popular methods due to its simplicity, relatively low cost, and producing daily evapotranspiration estimates. Because of the large area occupied by a class A pan, alternative methods have been sought to estimate ETo inside greenhouses. With the objective of evaluating the performance of evaporation pan in estimating the water consumption in greenhouse, one class A pan and one reduced pan installed inside the greenhouse and another class A pan was installed outside. In this research three drainage lysimeters indoor and three weighing microlysimeters for indoor and outdoor the greenhouse were used to determine the reference evapotranspiration. Coefficients of pans were obtained by comparing of the evaporation pans values with the data of the lysimeters. The results indicated the monthly evaporation values measured by the class A pan and reduced pan, (both inside the greenhouse) with the data of the lysimeters, R^2 was obtained 0.974 for the class A pan method, and 0.982 for the reduced pan method. Also with comparing between the monthly evaporation values measured by the class A pan outside the glasshouse and the data of the lysimeters inside, R^2 was obtained 0.756. Considering the high coefficients of correlation inside the glasshouse, it is possible to replace the class A pan outside with the class A pan and reduced pan inside to estimate ETo. Reduced pan has a low cost and is easy to use and also occupied a small area in the greenhouse, therefore it is recommend to replace instead of class A pan inside the greenhouse.

Keywords: Reference evapotranspiration, Pan coefficient, Greenhouse, Class A pan, Reduced pan.

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