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Windbreak trees for water-saving agriculture in Nile delta: are they effective?

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Measurements of sapflow and sapwood area of windbreak trees (Casuarina) in Nile delta allowed determination of transpiration. Relation between tree transpiration and characteristics of sample trees such as DBH or height, and detailed meteorology was examined. It was found that a good correlation exists between transpiration and vapor pressure deficit and downward short-wave radiation. Thus Penman-Monteith equa-tion was employed to estimate long-term transpiration. By applying results of previous studies on the performance of windbreak trees of various densities, an estimate was made on the effectiveness of windbreak tree for water saving in Nile delta farmland. The results shows that the transpiration of windbreak trees occupies only 0.28 % of the total evapotranspiration of the farmland, whereas evaporation reduction by the intro-duction of windbreak trees could be as large as 20-24% of the total evapotranspiration.

Keywords: Windbreak trees, Casuarina, sapflow measurements, Evaporation reduction