

ABSTRACT

EVALUATION OF LYSIMETER APPLICATION TO ESTIMATE STANDARD EVAPOTRANSPIRATION AND CROPS EVAPOTRANSPIRATION OF SOYBEAN (*Glycine max* (L) Merrill)

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The purpose of this research was to evaluate estimating method of standard evapotranspiration and crops evapotranspiration using lysimeter then be compared with estimation result of evaporimeter pan and Penman – Monteith model who recommended by FAO. Standard evapotranspiration was estimated using reference crops and crops evapotranspiration was estimated using soybean Kaba variety which planted in lysimeters. Rainfall data and standard evapotranspiration of evaporimeter pan be obtained from Agroclimate stations of Masgar in Pesawaran distric in Lampung, and evapotranspiration Penman – Monteith model was estimated by CROPWAT using climate data during 2007 – 2011 from Agroclimate stations of Masgar.

The estimating result of standard evapotranspiration and crops evapotranspiration using lysimeter was higher than evaporimeter pan and model. The estimation results of standard evapotranspiration and crop evapotranspiration of Lysimeter was higher than the estimation evaporimeter pan and model. The average of standard evapotranspiration during nine dasarian is 6.14 mm/day, average of crop evapotranspiration is 7.54 mm/day, while the standard evapotranspiration of evaporimeter pan is 3.55 mm / day, and standard evapotranspiration estimation results with CROPWAT for November to February are 3.27; 3.20; 3.63; 3.51 mm/day. Crop coefficient (Kc) estimation results of each phase was 0.96 in the initial phase, 1.16 in the development phase, 1.67 in the mid season phase, and 1.18 at the end season phase. Crop coefficient (Kc) Soybean lysimeter estimation results are higher than FAO Crop coefficient recommendation. However observed from the growth and yield of soybean plants seen their best with 10.73 gr of 100 seeds of yield. So that suggested for further research with direct ET_o measurement method can be applied with modification or regenerated of lysimeter specifications and construction to consider other parameters of water balance in lysimeter.

keywords : standard evapotranspiration, crops evapotranspiration, lysimeter, soybean

ABSTRAK

EVALUASI PENGGUNAAN LYSIMETER UNTUK MENDUGA EVAPOTRANSPIRASI STANDAR DAN EVAPOTRANSPIRASI TANAMAN KEDELAI (*Glycine max L. Merrill*)

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Penelitian ini bertujuan mengevaluasi metode pendugaan evapotranspirasi standar (ET_o) dan evapotranspirasi tanaman (ET_c) kedelai menggunakan lysimeter dibandingkan dengan hasil pendugaan panci evaporasi dan dengan rumus *Penman – Monteith* yang direkomendasikan oleh FAO. Nilai ET_o diduga menggunakan lysimeter dengan tanaman acuan sedangkan Nilai ET_c lysimeter dengan kedelai varietas Kaba. Data curah hujan, dan evapotranspirasi panci didapat dari stasiun Klimatologi Pertanian BMKG Masgar, dan data evapotranspirasi rumus *Penman – Monteith* diduga dengan CROPWAT menggunakan data iklim tahun 2007 – 2011 dari stasiun Klimatologi Pertanian BMKG Masgar.

Hasil pendugaan ET_o dan ET_c Lysimeter lebih tinggi daripada hasil pendugaan Panci dan Rumus. Rata-rata ET_o selama sembilan dasarian adalah 6,14 mm/hari, rata-rata ET_c 7,54 mm/hari, sedangkan ET_o panci 3,55 mm/hari, dan ET_o hasil pendugaan dengan CROPWAT untuk November sampai dengan Februari yaitu 3,27; 3,20; 3,63; 3,51 mm/hari. Nilai Koefisien Tanaman (K_c) hasil pendugaan tiap fase adalah 0,96 pada fase *initial*, 1,16 pada fase *development*, 1,67 pada fase *mid season*, dan 1,18 pada fase *end season*. Koefisien Tanaman (K_c) Kedelai hasil pendugaan lysimeter lebih tinggi daripada K_c yang direkomendasikan FAO. Namun dilihat dari pertumbuhan dan hasil panen tanaman kedelai terlihat optimal dengan hasil panen 10,73 gr perseratus biji. Sehingga disarankan untuk penelitian selanjutnya dengan metode pengukuran ET_o secara langsung dilakukan dengan modifikasi spesifikasi dan konstruksi lysimeter yang diperbarui dengan memperhitungkan parameter lain dalam neraca air lysimeter.

Kata kunci : evapotranspirasi standar, evapotranspirasi tanaman, lysimeter, kedelai