

Review for “Seasonal variability in evapotranspiration partitioning and its relationship with crop development and water use efficiency of winter wheat”

Abstract

Lines 21-22: Specify the definition of water use efficiency used in this study.

Lines 24-25: Not clear. What do you mean by ranging from 0.51 to 0.98? Seasonal variations of F_T for all different treatments?

Lines 31-32: How can you increase/decrease F_E during different periods? In addition, there should be an optimal range for F_E during different periods. I do not think increasing F_E will definitely result in higher WUE.

Introduction

Lines 54-55: You should also introduce several recently proposed ET partitioning methods, such as

Zhou, Sha, et al. "Partitioning evapotranspiration based on the concept of underlying water use efficiency." *Water Resources Research* 52.2 (2016): 1160-1175.

Scott, Russell L., and Joel A. Biederman. "Partitioning evapotranspiration using long-term carbon dioxide and water vapor fluxes." *Geophysical Research Letters* 44.13 (2017): 6833-6840.

Line 74: I do not agree with “precisely”. The isotope method is better suited to more arid environments with sparse vegetation, and large uncertainty may exist in agricultural systems, see

Griffis, Timothy J. "Tracing the flow of carbon dioxide and water vapor between the biosphere and atmosphere: A review of optical isotope techniques and their application." *Agricultural and Forest Meteorology* 174 (2013): 85-109.

Lines 100-101: What kinds of possibilities? Could you point out the possibilities more clearly and provide relevant references?

Lines 110-112: add reference

Lines 142-143: Have you applied the results to practices? Or do you mean the results can be applied to practices?

Methods

Line 220: Only one ET partitioning method was used.

Section 2.3: Did you apply the partitioning method based on isotopic composition of $d^{18}O$ only? I find you observed both dD and $d^{18}O$ in different water pools.

Results

Line 287: What is LMWL? I find this is the first appearance of the acronym, so you should add detailed explanation or definition.

Fig. 1. It is not clear in which experiment the data shown in Fig. 1 were observed. Do the results vary in different experiments?

Line 326 and other places: No Table 4 in this study. I suppose it is Table 3. Is 292.8mm the mean value across all treatments in both 2014 and 2015?

Lines 363-366: The linear correlation does not measure how strong T_{jf} contributes to variations in ET. Please use variance analysis instead.

Fig. 5: In which experiment do you get the F_T and LAI data? Does the relationship vary in different experiments?

Discussion

Line 435: scales

Lines 442-444: Could you explain more why high F_T exists even when LAI is low? Are there any mechanisms or some uncertainties in the observed data? Many studies show that the isotope method would obtain higher values of F_T than other ET partitioning methods.

Lines 496-500: I do not agree with “optimally” used here. The results just compared several different treatments in 2014 and 2015. Although grain yield and WUE are higher in the T1 treatment in 2015, it is not optimal since there would be better treatments that were not considered in this study. Since different treatments were used in 2014 and 2015, it is not clear to what extent the increase of grain yield and WUE is attributed to different treatment, since different environmental conditions also play a part in different years.

Lines 500-503: How can you control the wetting layer? It seems that the wetting layer is not controlled to 0-70cm in this study. So the irrigation scheme can be further improved? This also contradicts to the so-called optimal agricultural management practice.

Section 4.3: Please add more limitations of this study, especially ET estimation and retrieval of isotopes in agricultural ecosystems, see Griffis (2013). In addition, the section title “further scopes of this study” is not appropriate, use “limitations of this study”.