**Figure S1** : Evolution of the daily $ET_0$ and of LAI at the R3 site for the 2003 and 2013 seasons.
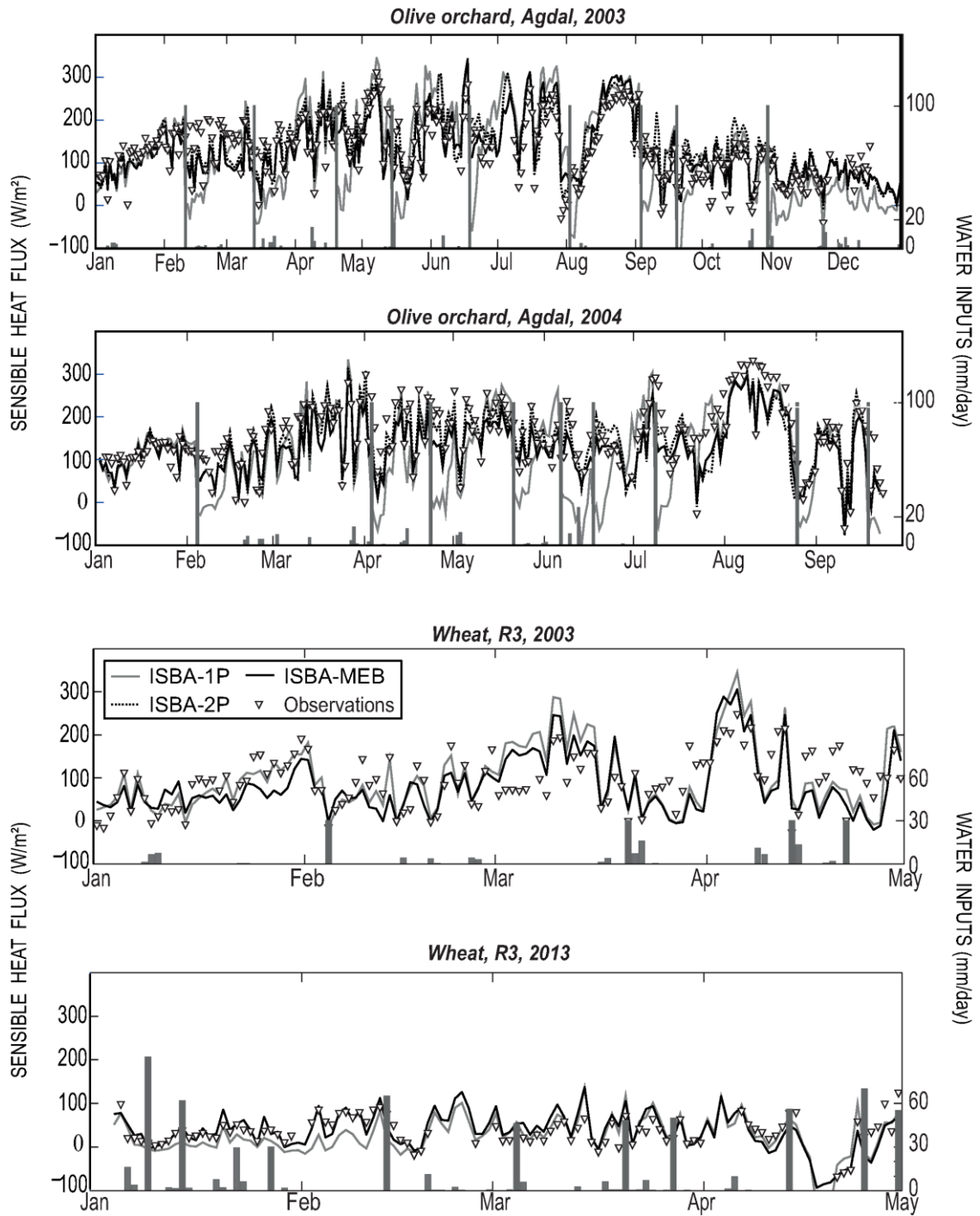
**Figure S2** : Time series of the simulated and measured sensible heat flux (H) for the Agdal site (2003 and 2004 seasons) and for the R3 site (2003 and 2013 seasons).
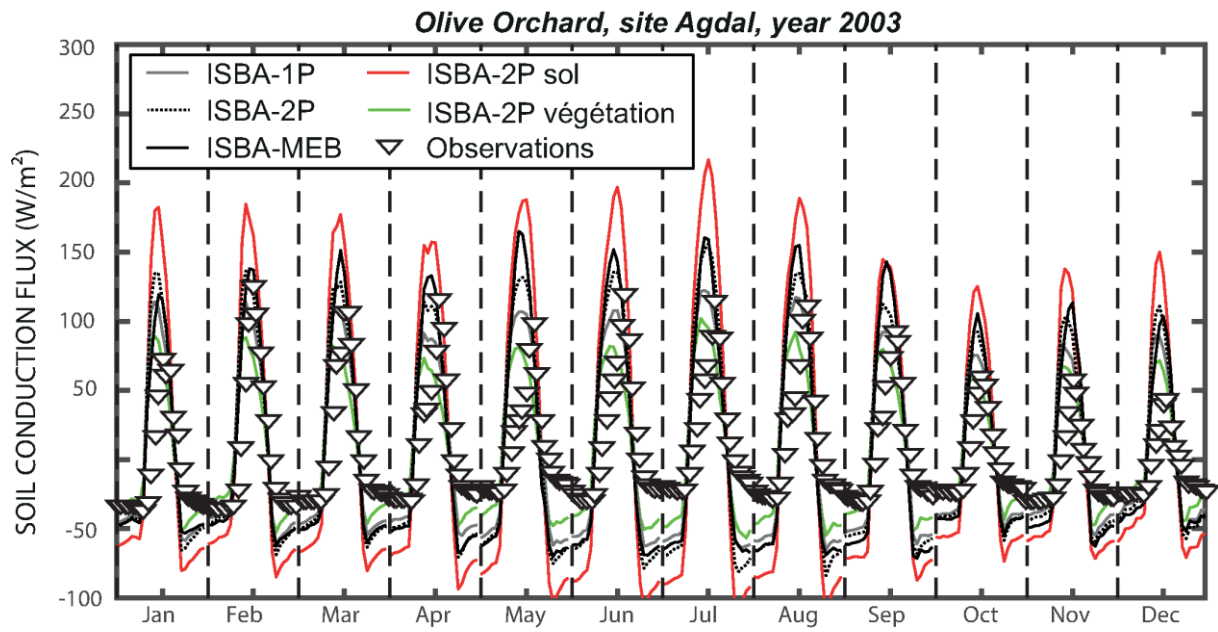
**Figure S3** : Monthly diurnal cycles of the ground heat flux (G) simulated by the three configurations with a distinction between the patch bare soil and the patch vegetation for the 2P configuration.
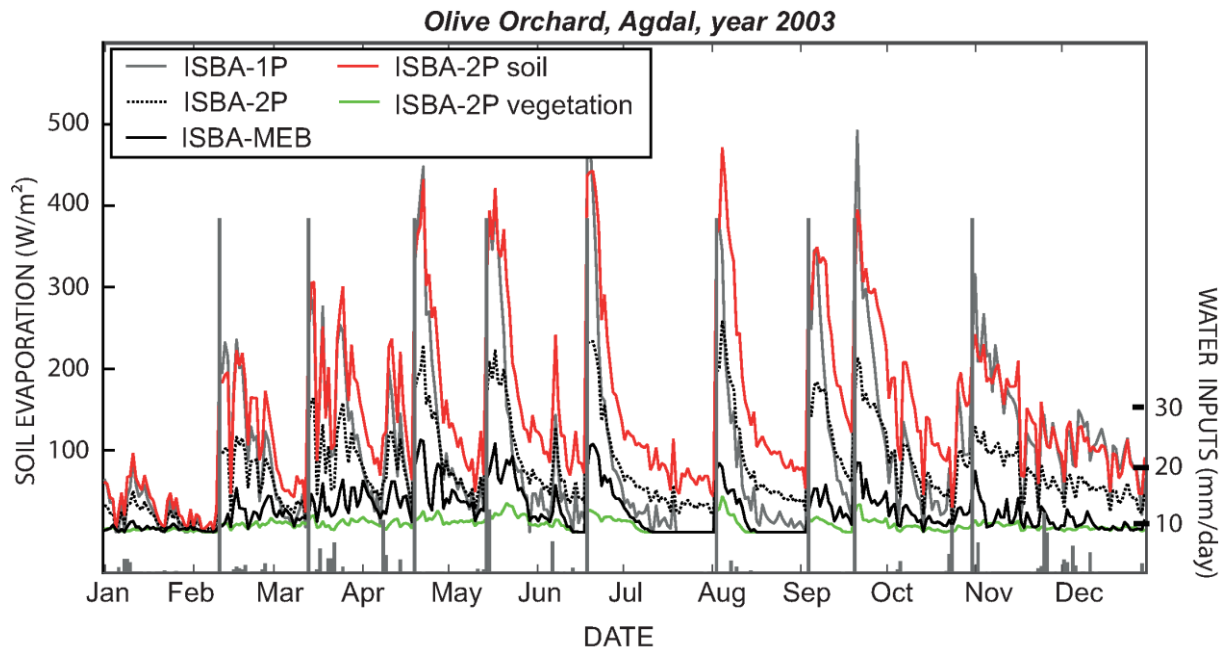
**Figure S4** : Time series of the soil evaporation simulated by the three configurations for the Agdal site (2003 season). The two patches of ISBA-2P "bare soil" and "vegetation" were added for comparison.