

## Supplementary Material

### **Effects of conservation tillage, controlled traffic and regulated deficit irrigation on soil CO<sub>2</sub> emissions in a maize-based system in Mediterranean conditions**

*Authors:* Carlos Salamanca-Fresno<sup>a</sup>, María-Auxiliadora Soriano<sup>b</sup>, Luca Testi<sup>a</sup>,  
Helena Gómez-Macpherson<sup>a\*</sup>

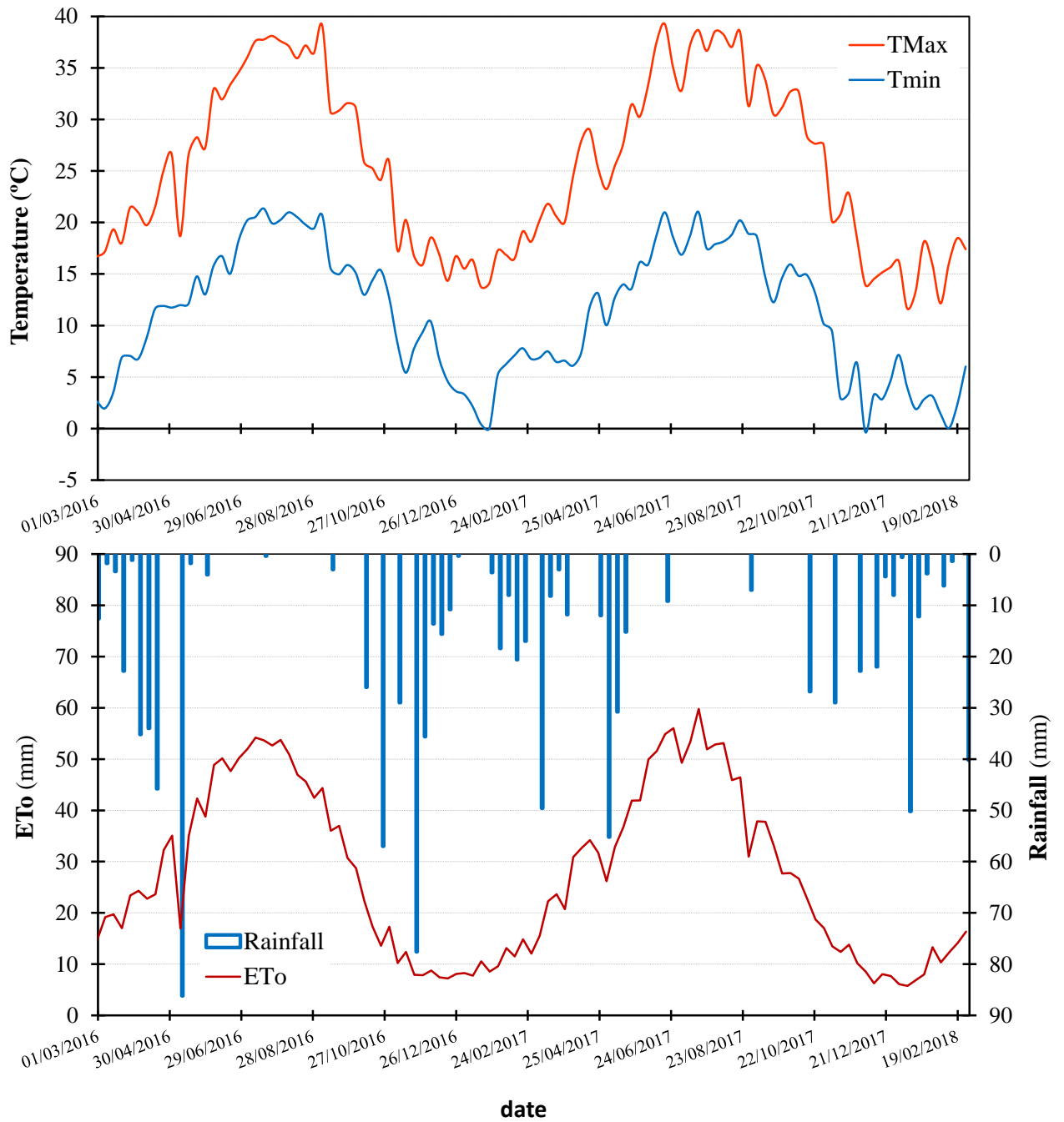
<sup>a</sup> Agronomy Department, Institute for Sustainable Agriculture (IAS-CSIC), Campus Alameda del Obispo, Córdoba, Spain

<sup>b</sup> Agronomy Department, Escuela Técnica Superior de Ingeniería Agronómica y de Montes, Campus Rabanales, Universidad de Córdoba, Spain

\*Author for correspondence ([helena.gomez@ias.csic.es](mailto:helena.gomez@ias.csic.es))

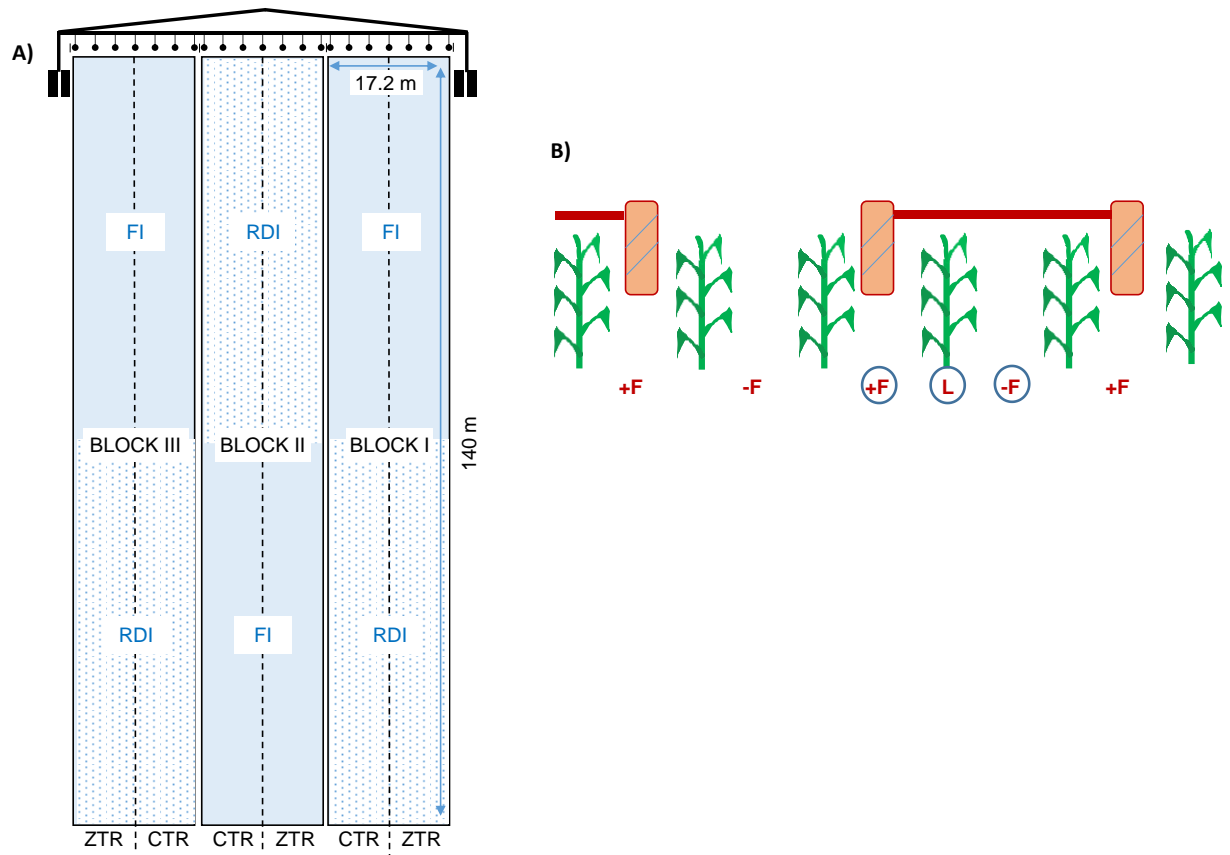
## 2. Materials and methods

### 2.1 Experimental site



**Figure S1.** Weekly average of maximum and minimum daily temperatures ( $^{\circ}\text{C}$ ) and weekly-accumulated rainfall and ETo (mm) during the two agricultural seasons of this study (2016/17-2017/18) at the experimental site.

## 2.2 Treatments and farming operations



**Figure S2.**

A) Scheme of the experimental design, showing the distribution of tillage system (CTR and ZTR) and irrigation strategy (FI and RDI) treatments in each block.

B) Arrangement of the three consecutive PVC collars in an elementary plot. Each group of three collars [+F, L, -F] in consecutive positions constitutes a measuring site, or unit of measure, for the two main factors (tillage system and irrigation strategy).

**Table S1.** Number of irrigations and fortnight irrigation amount for FI and RDI treatments during the 2016 and 2017 irrigation seasons.

watering period	2016 irrigation season (May 6th - August 18th)			2017 irrigation season (April 18th - August 10th)		
	number of watering	irrigation amount (mm)		number of watering	irrigation amount (mm)	
		FI	RDI		FI	RDI
April 16-30	---	---	---	2	17.0	17.0
May 1-15	1	14.2	14.2	---	---	---
May 16-31	1	5.7	5.7	3	37.4	37.4
June 1-15	3	85.4	65.5	3	89.0	66.8
June 16-30	4	132.9	116.3	4	124.4	116.0
July 1-15	4	123.3	108.2	3	83.9	71.2
July 16-31	3	104.4	78.3	4	129.9	97.5
August 1-15	4	99.9	75.0	3	101.5	76.1
August 16-31	1	22.8	17.1	---	---	---
<b>Total</b>	<b>21</b>	<b>589</b>	<b>480</b>	<b>22</b>	<b>583</b>	<b>482</b>

### 3.4 Diurnal patterns and seasonal soil CO<sub>2</sub> emissions

**Table S2.** Daily mean, and minimum and maximum diurnal soil C-CO<sub>2</sub> effluxes (mg m<sup>-2</sup> h<sup>-1</sup>) measured during the three diurnal cycles in the CTR and ZTR tillage systems, and relative difference in relation to the 24-h mean for the minimum and maximum diurnal values (%; negative value = underestimation; positive values = overestimation). CV = coefficient of variation (%)

Date	Ortho – Sunset (GMT)*	Measurement start – end (GMT)	Tillage system	C-CO <sub>2</sub> efflux (mg m <sup>-2</sup> h <sup>-1</sup> )		Relative Difference (from 24-h mean)	
				24-h mean (CV)	Min – Max value	Min (%)	Max (%)
June 2, 2016	5:05 – 19:33	4:50 – 21:00	CTR	651 (24.3)	578 – 720	-11.1	10.6
			ZTR	550 (3.2)	447 – 622	-18.7	13.1
Oct 27, 2016	7:03 – 17:35	6:05 – 18:30	CTR	393 (32.4)	319 – 462	-18.8	17.5
			ZTR	346 (30.4)	329 – 364	-4.8	5.0
July 31, 2017	5:20 – 19:18	5:10 – 19:45	CTR	222 (7.1)	193 – 257	-13.3	15.7
			ZTR	211 (9.3)	190 – 237	-9.7	12.1

\* GMT = local time –2-h