

SUPPLEMENTARY INFORMATIONS

Table S1. Dates of sowing and harvesting of durum wheat, and average values of the main climatic indicators recorded between sowing and harvesting dates in 2015-16 and 2016-17 growing seasons. Climatic data are from a Meteo-France weather station located at the INRAE station, 100m from the experimental fields.

Growing season	Sowing date	Harvesting date	Mean daily temperature (min to max) (°C) between sowing and harvesting	Rainfall (mm) between sowing and harvesting (n. of rainy days)	Potential evapotranspiration Penman (mm) between sowing and harvesting
2015-16	17 Nov. 2015	06 Jul. 2016	13.0 (-1.1 to +32.9)	223 (48 days)	590
2016-17	02 Dec. 2016	30 Jun. 2017	12.8 (-6.1 to +36.2)	282 (49 days)	551

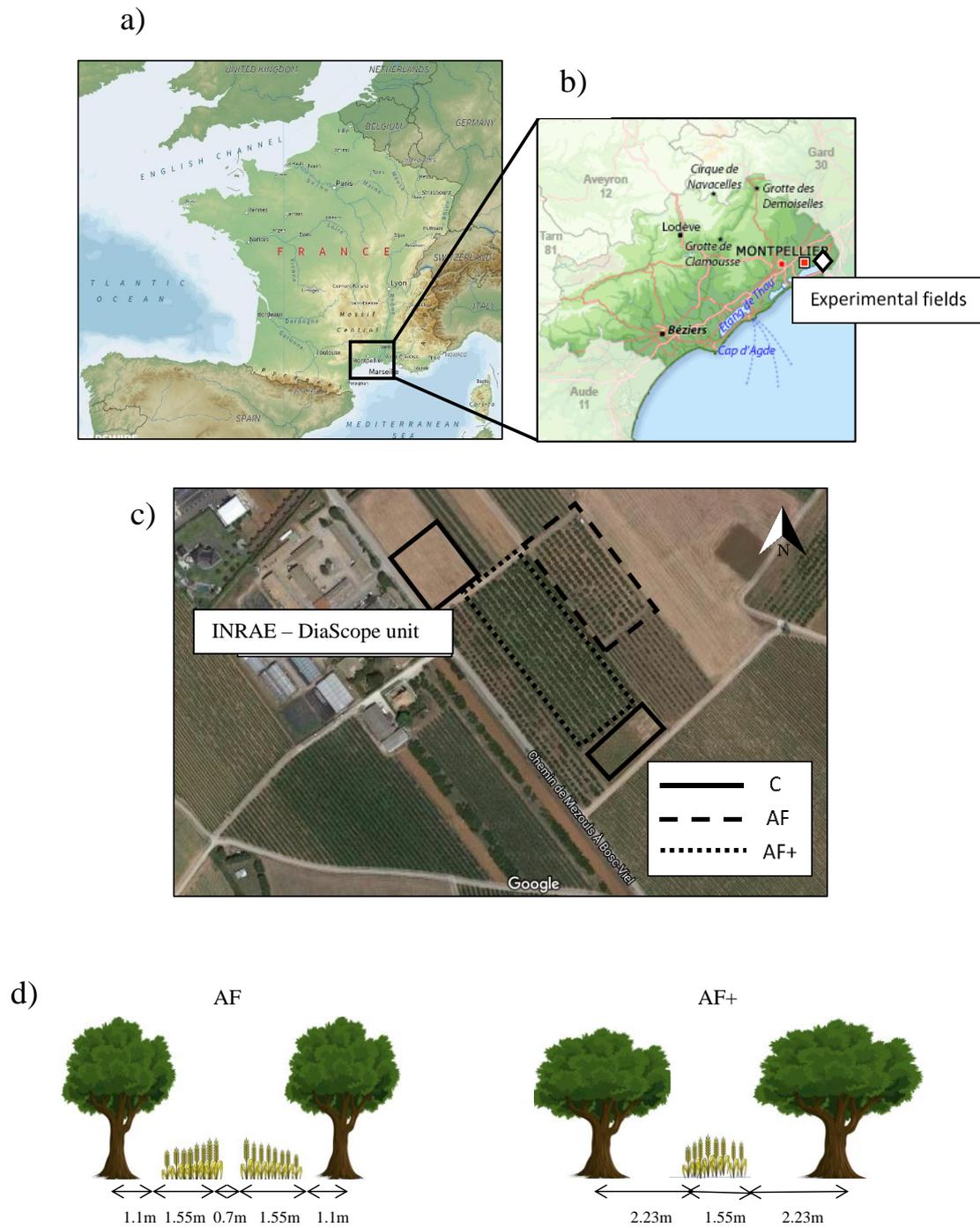


Table S2. Details of the sensors used for recording microclimatic and edaphic parameters in the 3 treatments (C, AF, and AF+) from wheat sowing to harvesting during 2015-16 and 2016-17 growing seasons.

Parameter	Sensors	Recording time and units
Global radiation	SKS 1110 PYRANOMETER Skye Instruments LTD, linearity error -0.2% Working range: 0 – 500 w/m ²	C: recorded hourly. AF and AF+: recorded every 5 seconds, then averaged every 15 minutes.
PAR	Pyranometer SP-LITE Campbell Scientific Ltd Linearity error <10% Working range: 0.4 - 1.1 μm	(Joule/cm ² in C; W/m ² in AF and AF+; converted to $\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$)
Air temperature (T °C) and relative humidity (RH)	HMP60 probes, through INTERCAP capacitive RH chip Working range T °C = -40° to 60°C Working range RH = 0 to 100%	C: recorded hourly. AF: recorded every 15 minutes, then averaged hourly. (Temperature: °C; Relative humidity: %)
Wind speed (mean and maximum)	3 cups anemometer Campbell Scientific Ltd Linearity error <1.5% Working range: 0 – 45m/s	C: recorded hourly. AF and AF+: recorded every 15 minutes. (m.s ⁻¹)
Soil water availability	WATERMARK Model 200SS IRROMETER company Working range: 0 – 239 kPa	Recorded every 15 minutes. (KPa)

Table S3. Average air temperature and relative humidity recorded in C and AF treatments within three times of the day (Time1= 12pm-5 am, Time2= 6am-12am, Time3= 1pm-11pm), during 2016-17 growing season at stem elongation, heading and anthesis, and maturity. Within the same wheat cycle period and time of the day, air temperature (°C) and relative humidity (%) are also expressed as difference between AF and C treatments. For each microclimate parameter, in a same line, different letters indicate significant difference according to the Tukey's HSD test ($P \leq 0.05$).

Cycle period	Time	Air temperature (°C)			Air relative humidity (%)		
		C	AF	Difference AF-C	C	AF	Difference AF-C
Stem elongation	Time 1	6.5 a	6.6 a	+0.1	85.5 a	83.0 a	-2.5
	Time 2	9.3 a	7.6 b	-1.7	76.4 a	78.7 b	+2.3
	Time 3	10.6 b	11.2 a	+0.6	73.6 b	68.2 a	-5.4
Heading and anthesis	Time 1	9.0 a	9.1 a	+0.1	82.8 a	81.6 a	-1.2
	Time 2	15.3 a	12.9 b	-2.4	62.9 a	68.2b	+5.3
	Time 3	15.3 b	16.9 a	+1.6	63.6 b	58.6 a	-5.0
Maturity	Time 1	16.7 a	16.1 a	-0.6	89.2 a	88.5 a	-0.7
	Time 2	24.2 a	21.6 b	-2.6	60.0 a	66.1 b	+6.1
	Time 3	22.7 b	24.2 a	+1.5	67.6 b	59.7 a	-7.9
Average	Time 1	9.2 a	9.3 a	+0.1	85.9 a	84.0 a	-1.9
	Time 2	13.7 a	11.8 b	-1.9	70.5 a	73.9 b	+3.4
	Time 3	14.1 b	15.3 a	+1.2	70.6 b	64.5 a	-6.1