

Regulated deficit irrigation in table olive trees during a sensitive period.

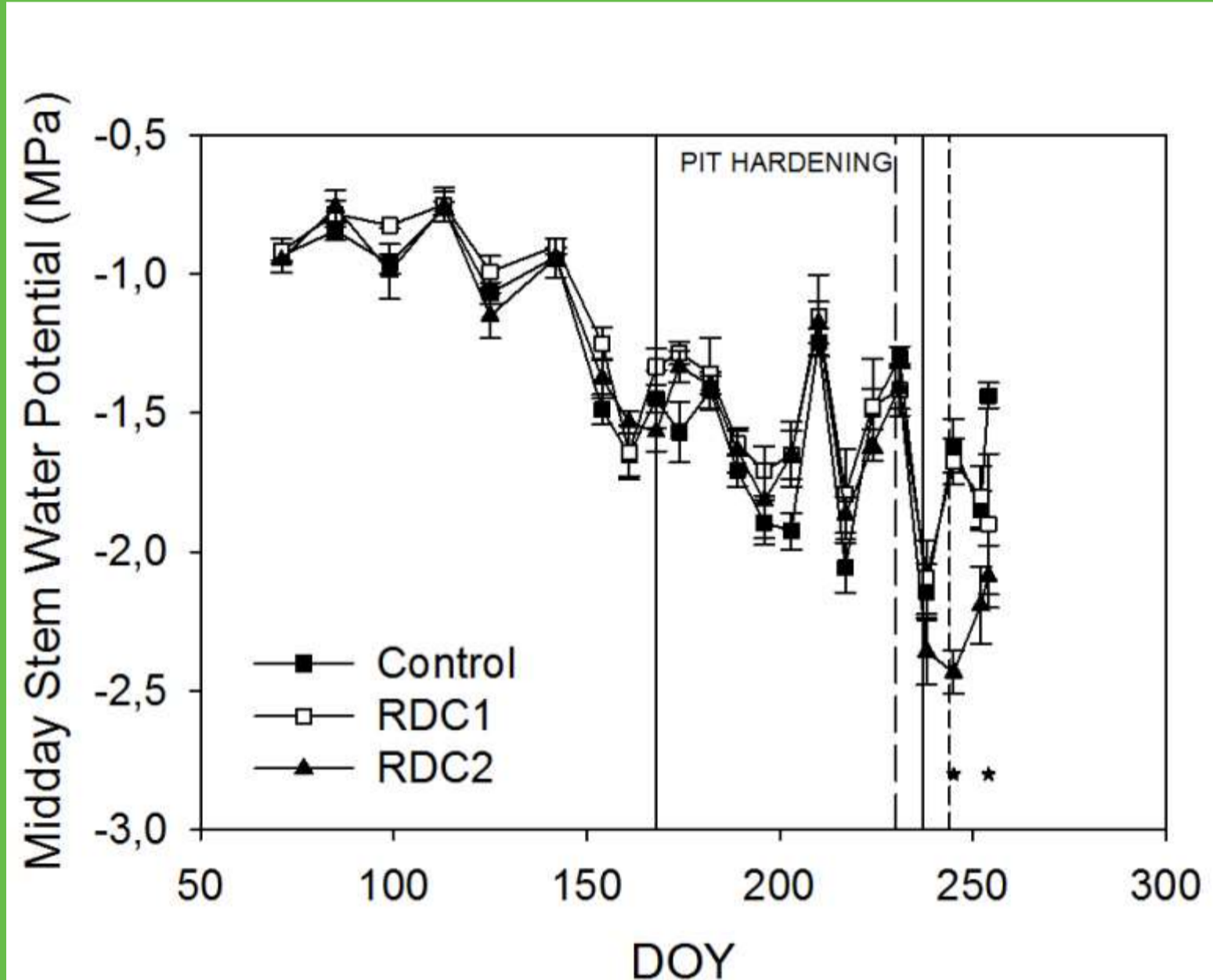
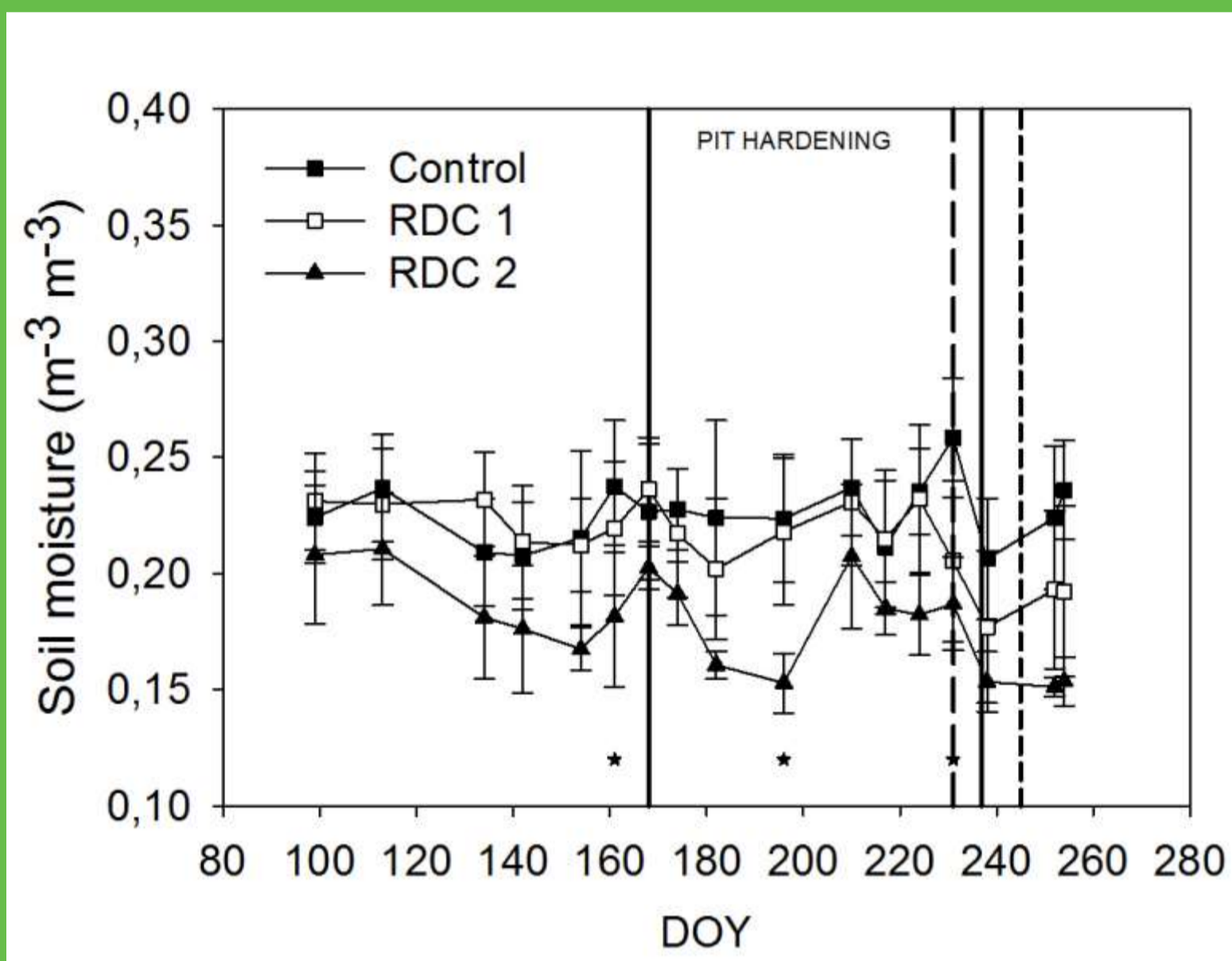
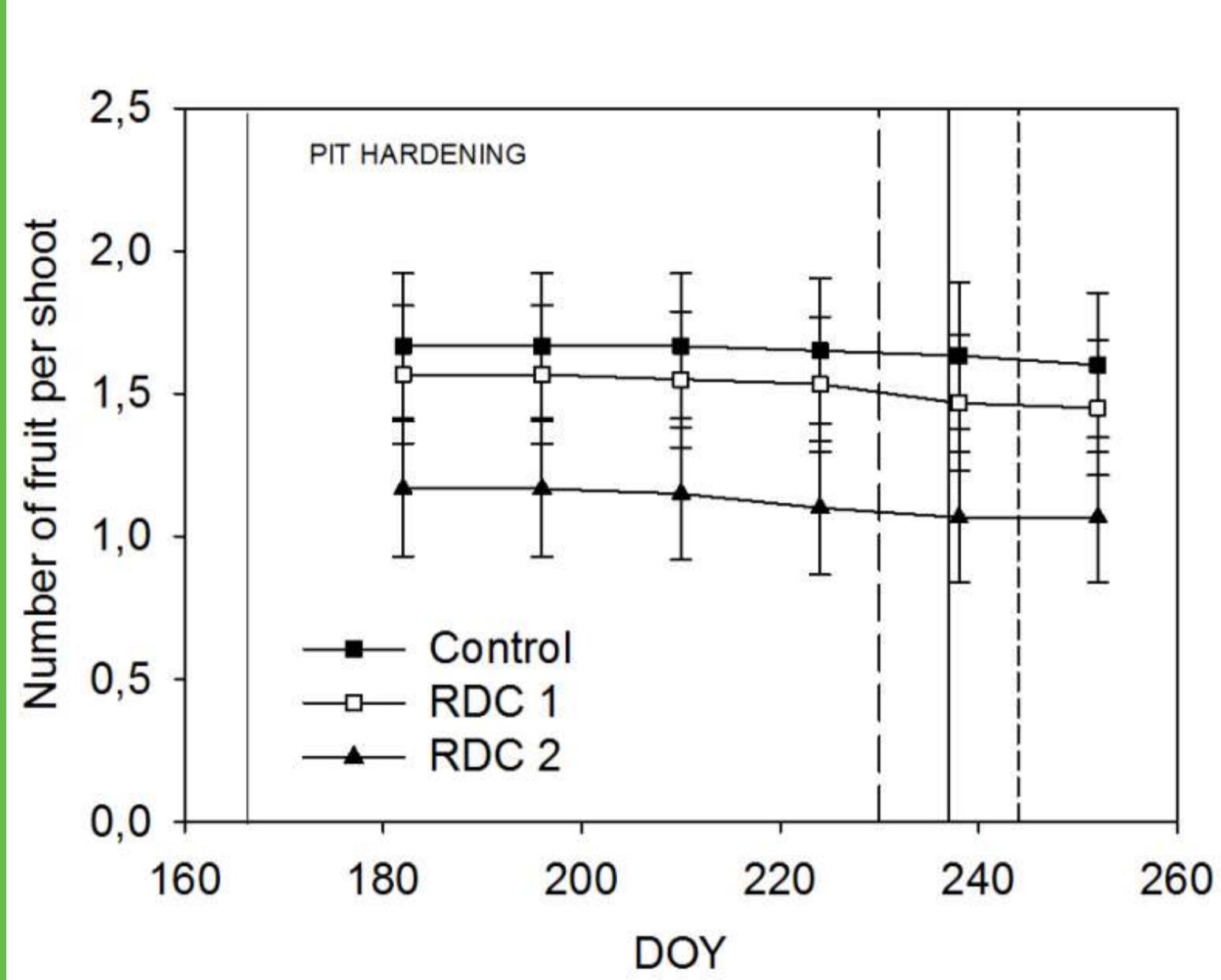
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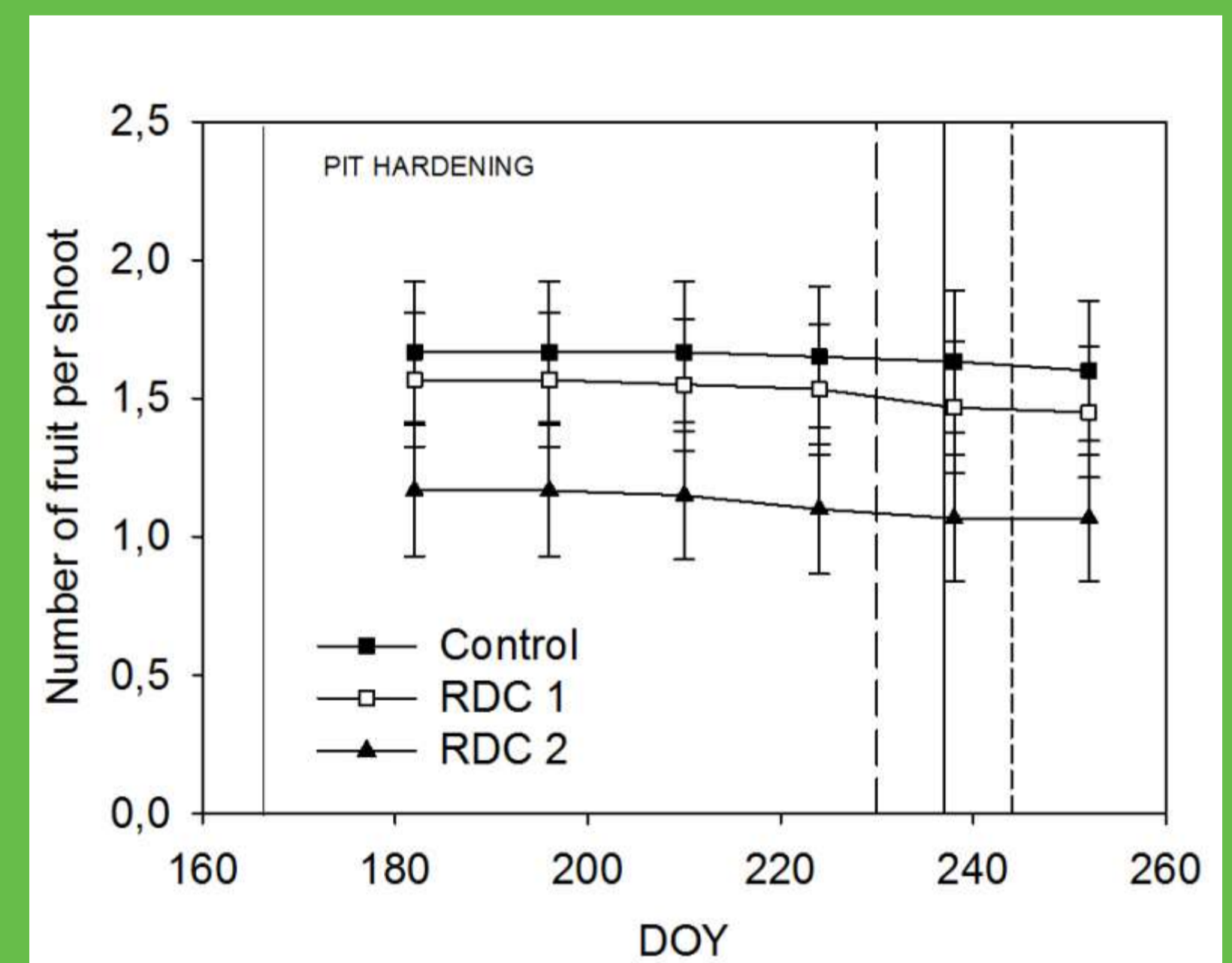
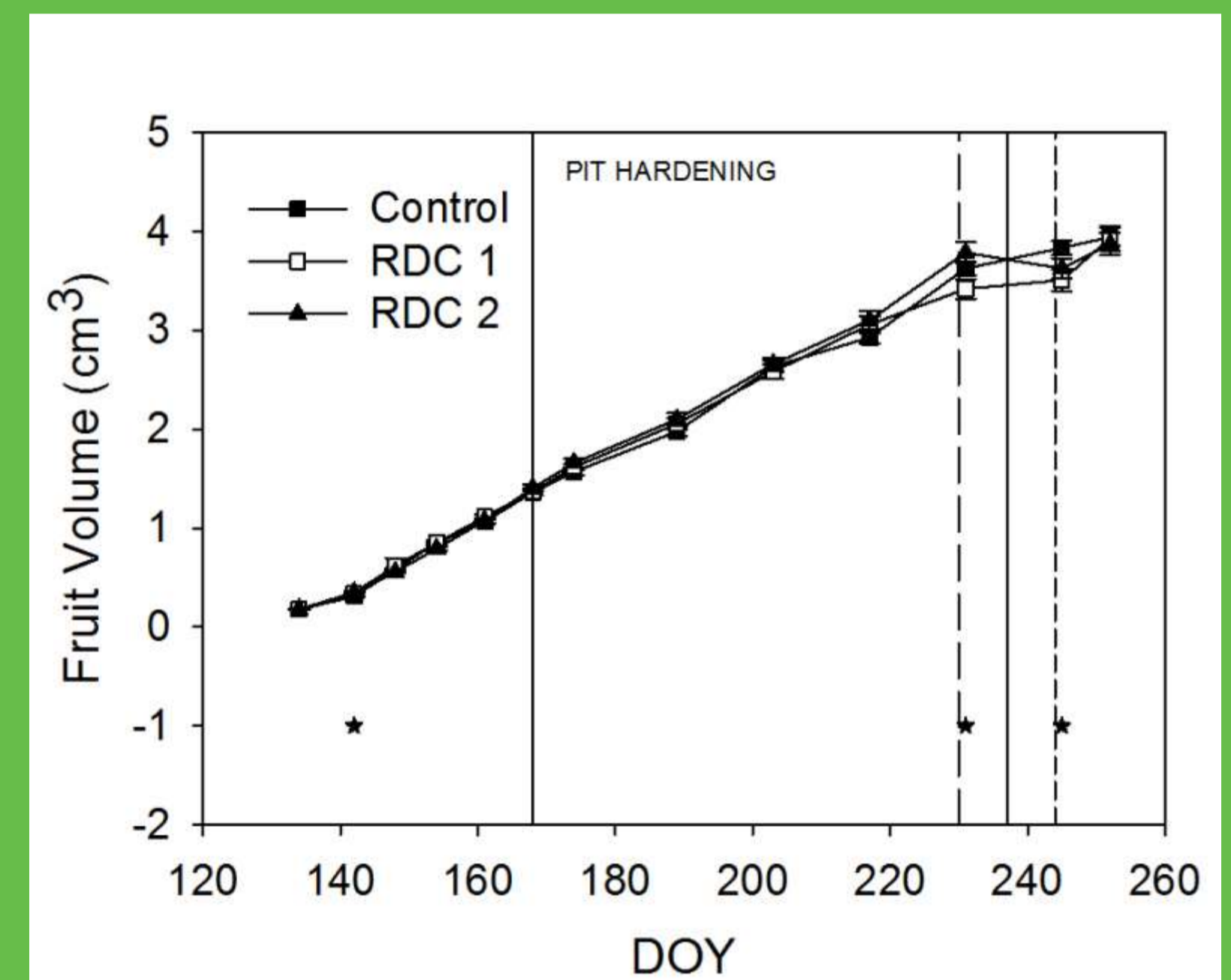
A) Water applied; B) Soil moisture; c) Midday stem water potential. Vertical bars represent the standard error. Vertical Dashed lines indicate the beginning period of water deficit.

Olive tree is one of the most important irrigated fruit at Spain (around 400.000 ha). The water needs in olive orchard are greater than the water availability. Therefore, deficit conditions are common at the field. The aim of this work is to study a regulated deficit irrigation (RDI) scheduling based on midday stem water potential (Ψ) that limits irrigation before harvest. The experiment was performed at La Hampa experimental farm (Coria del río, Seville, Spain) in 45 years-old olive (cv Manzanillo). Three irrigation treatments in a complete randomized block design were performed during 2014.

- Control trees were irrigated in order to maintain Ψ with higher values than -1,2 MPa before pit hardening and -1,4 MPa until harvest.
- RDI 1 and RDI 2 were irrigated as Control until 2 and 4 weeks, respectively, before harvest when water was withheld until -2,5 MPa.

Water status parameters suggest moderate water stress level. In such conditions the number of fruit and inflorescent per shoot were not significantly affected. However, fruit volume and the number of fruit per Kg at harvest tended to lower values, with significant differences, in RDI 1 and 2 than Control. Yield and quality parameters were not significantly affected, though Control tended to superior values.

The RDCs confirm previous works that suggest a threshold value of -2 MPa as a water level which fruit volume is not affected. The water stress level obtained in the experiment could be adequate since the water saving was likely higher than no significant adverse effects.



A) Pattern of fruit volume during the experiment. Vertical bars represent the standard error. Vertical Dashed lines indicate the beginning period of water deficit.



A) Experimental orchard view; B) pressure chamber; C) typical manual harvest in seville table olives; D) harvest; E) first five maturity index in olive (0, 1, 2, 3 and 4 respectively).

Harvest and quality parameters: Yield (metric tons per hectare, MT ha⁻¹), soil cover (SC, %), number of fruit per kilogram (Fruit kg⁻¹), maturity index (MI), pulp-stone fresh ratio (PS fresh ratio), pulp-stone dry ratio (PS dry ratio), Water applied (WA, mm) and water-use efficiency (WUE, EUA, Kg mm⁻¹).

	Yield	SC	Fruit kg ⁻¹	MI	PS fresh ratio	PS dry ratio	WA	WUE
Control	14,7±1,6	49,0± 5,2	244±9	0,82±0,03	4,6± 0,1	2,1± 0,1	278± 22 a	51,9± 2,9
RDC 1	12,2±2,4	37,6± 4,5	261±21	0,98±0,09	4,6± 0,2	2,2± 0,1	242± 54 ab	52,1±10,4
RDC 2	12,0±2,4	43,0± 4,3	275±15	0,78±0,08	4,4± 0,2	2,2± 0,1	143± 13 b	88,3±16,7