

Boron in Olives

Study Details

Research institution: Juan Vilar Consultores Estratégicos

Date: 2022

Location: Baeza, Jaén, Spain

Soil: Clayey loam; pH (CaCl₂) = 8.51

Fertilizers: *Solubor*[®]

Crop variety: Picual

Trial design: 1B: 0.3% stocking rate, 6l/olive, 1.8 kg/ha; 2B: 0.6% broth consumption, 6l/olive, 3.6 kg/ha; Control: Boron is not applied.

Results

Solubor treatment improves potassium levels in the olive tree, improving the morphology and weight of the fruit, as well as the fat yield of the same, therefore the production of the olive tree will be higher.



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Characteristics and location of the trial



2022	Municipal area	Designation	SIGPAC reference	Cultivation system	Planting density (olive trees/ha)	Water regime	Variety
OLIVE TREES	Baeza (Jaén)	Fuente del Olivar	23/9/25/359	Traditional	100	Rainfed	Picual



Soil type: Clayey loam

Soil pH (CaCl₂): 8.51

EC: 0.41 Ds/m

O.M: %: 1,3%

CEC : 29.11 Cmolc/kg soil

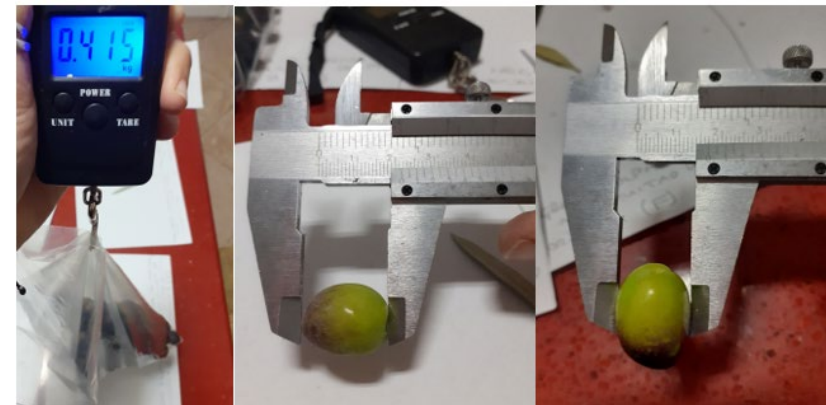
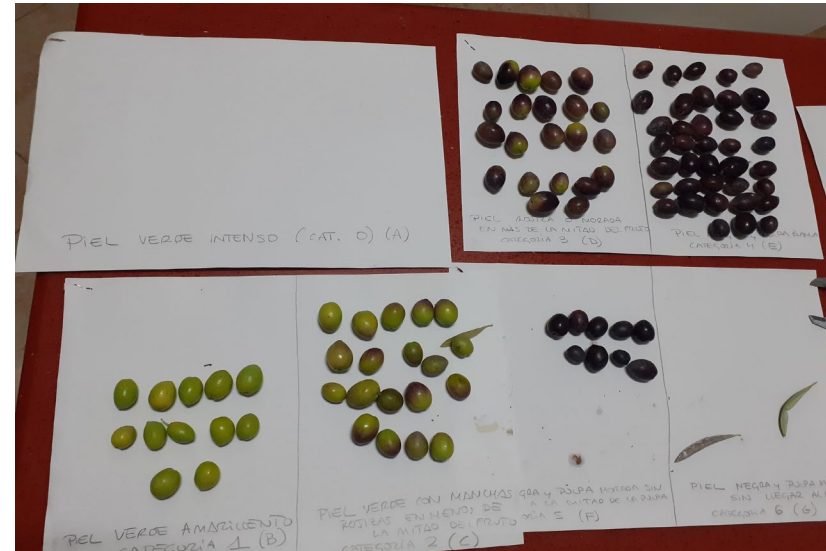
C/N 10.68

PSI 2.71%

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Test description

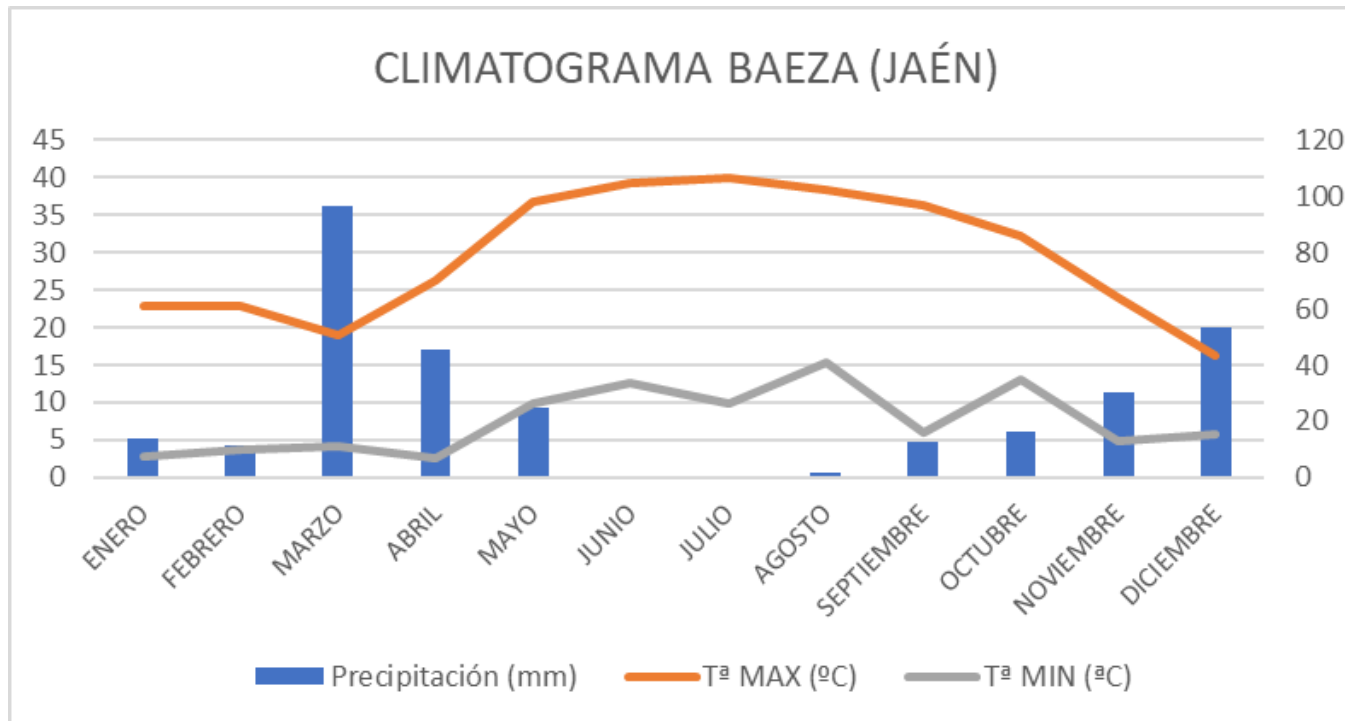
- Annual trial
- Parameters evaluated:
 - Micro and macro nutrients at foliar level
 - Fat yield
 - Physical characteristics of the fruit (weight/shape index and ripening index)
 - General behavior of the crop



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Climatology

- Continental Mediterranean climate, with hot summers with low rainfall and cold winters
- Low rainfalls
- Very high temperatures from May to October
- Very adverse conditions for cultivation



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Maturity index and fruit weight



2022	MATURITY INDEX			FRUIT WEIGHT (g)		
	1B	2B	Control	1B	2B	Control
Olive grove fountain	3.04	3.48	3.6	3.98	3.86	3.79

- Little high maturity index in olive trees treated with boron
- Fruit weight not evaluable due to harvest discrepancy of olive trees

Fruit size is a critical factor for the quality of olives, especially table or green olives. In the normal evolution of fruit growth, the tree load—ie, the number of olives—is possibly the main determinant of fruit size in a given environment and crop conditions. In other words, **the greater the number of fruit, the smaller the fruit size.**

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Analytical determination



Description	Essay	HUMIDITY	FAT ON WET MATTER (%)	THEORETICAL INDUSTRIAL YIELD (%)	FAT ON DRY MATTER (%)
Olive grove fountain	Control	41,59	16,17	13,17	27,68
	1B	43,69	21,74	18,74	38,61
	2B	43,06	16,43	13,43	28,86

These results show that the treatment with boron, based on *Solubor* applied to olive groves, not only improves the nutritional status of the plant, but also improves the fat yield of the olive, which has a direct impact on the profitability of the crop.

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Foliar analysis



Descripción	Ensayo	% N	% P	% K	% Ca	% Mg	% Na	ppm Mg	ppm Cu	ppm Zn	ppm B	ppm Fe
Fuente del olivar	1B	1,33	0,05	0,47	1,50	0,21	0,01	27,65	45,00	9,20	18,75	37,35
	2B	1,21	0,06	0,49	1,43	0,15	0,01	26,70	95,25	9,15	18,75	58,00
	Control	1,29	0,06	0,41	1,52	0,19	0,01	31,30	54,60	9,85	15,60	48,05

An improvement in potassium levels was found in boron-treated olive trees with respect to the control treatment.

The results indicate that treatment with boron at normal doses *a priori*, improves the level of this nutrient and therefore the availability of the same for the crop—improving its agronomic characteristics and its development, which is visually manifested by a greater growth of shoots

Although the olive tree can adapt to high boron concentrations as it is tolerant to excess boron, it lives in drought conditions where boron is usually less available to the plant.

One consideration is that there has been less presence of parthenocarpic fruits in the boron-treated olive trees.

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Conclusions



- Boron-treated olive trees show a lower maturity index than untreated ones. The olive remains in veraison for a longer period of time—allowing a greater harvesting supply.
- Regarding fat in dry matter: Boron treatment improves yield by up to 5.5%
- These results show that boron treatment applied to olive trees not only improves potassium levels in leaves, but also improves fruit morphology, providing the olive tree with heavier fruits and higher olive fat yield, which has a direct impact on the profitability of the crop.
- The treatment with boron, *Solubor*, has an effect on a lower presence of parthenocarpic fruits, which implies a better fruiting and ripening process

Finally, it could be stated and ratified that the treatment with *Solubor* exerts the following positive effects on the olive tree after its treatment: It improves the levels of potassium in the olive tree, improving the morphology and weight of the fruit, as well as the fat yield of the same, therefore the production of the olive tree will be higher. In this study, subject to future ratifications.