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MINERAL NUTRIENT COMPOSITION OF LEAVES AND FRUITS OF BLACK TABLE OLIVE CV. GEMLIK

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Abstract

A comparative study on mineral composition of the olive trees was made to see the changes in the content of the nutrient elements in the component (leaf and fruit) parts. Differences between the leaf and fruit mean concentrations of the whole elements examined were found to be statistically significant. Potassium and boron concentrations in the fruits were higher than that of the leaves. But, the concentration of the rest of the elements in the fruits was lower than the leaves.

Due to the unique nutritional and gastronomic properties of olive (*Oleaeuropaea* L.) oil, world demand for it has increased dramatically in the last decade. This trend together with the introduction of intensive management practices, including irrigation has led to increase tree nutrient demands in olive orchards (Zipori*et al.* 2011). Mineral fertilization has been reported to influence olive yield and quality (Fernández-Escobar *et al.* 2006).

The Marmara region is the prime producer of table olives in Turkey. However, there are some problems with yield, quality and alternate bearing in the olive orchards. The study was conducted in 64 orchards with cv. Gemlik table olive trees in towns of İznik, Orhangazi, Gemlik, Mudanya and Nilüfer of Bursa province.

The leaf samples were collected, prepared and analyzed for the macro-and micronutrients contents as described by (Kacar and İnal 2008). All the analysis were carried out in duplicates and the results were statistically analyzed using t-test.

Percentage of the leaves containing macro- and micronutrients below the normal levels were 39, 6, 100, 11 and 56 of samples for N, P, K, Ca and Mg, respectively and 13, 86, 31, 8 and 100 for Fe, Zn, Mn, Cu and B, respectively. As a result, no examined nutrients were found to be sufficient according to sufficiency ranges proposed by Jones *et al.* (1991).

Percentage of the fruits containing micro-nutrients below those normal values were 87 and 39 of fruit samples for Fe and Zn, respectively (Table 1). The rest of the macro and micro-nutrients in the fruits were sufficiently higher than the normal values according to Güceyü and Başoğlu (2010)

The concentrations of all elements determined in the leaves were dramatically higher than that in the fruit except K and B (Table 1). These differences also proved to be statistically significant. Partitioning pattern of the elements in the component parts is very important for the diagnosing nutrient deficiency. Therefore, both fruit and leaf analysis should be individually proposed for evaluations of sufficiency status of K and B in the olive trees.

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Table 1 . Concentrations of the elements in inorganic elements.

	mg / kg									
	N	P	K	Ca	Mg	B	Fe	Zn	Cu	Mn
Leaf	15200 a	1200a	4300b	12300a	1900a	7.42b	118.67a	12.56a	32.42a	32.67a
Fruit	7000b	1100b	14000a	700b	600b	15.76a	10.84b	8.78b	10.54b	4.60b
t ratio	26.74	4.19	–34.85	51.16	32.35	–6.93	16.96	6.05	6.23	18.96
Significance	**	**	**	**	**	**	**	**	**	**

The means are averages of 64 groves. p > 0,01. **p > 0,05. *n.s. not significant.

Leaf K concentrations regularly declines from the beginning of growing season and translocates to the fruits as the season progress. Therefore, K concentration sharply decreases in the leaves (Table 1) due to a large K accumulation in the fruits (Deidda 1968). Higher B concentrations in fruits than that of the leaves could be due to translocation of B from leaves to developing tissues (Delgado *et al.* 1994).

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