HortScience 26(5):605. 1991.

Rooting of Olive Cuttings with Fruit Attached Following Killing of the Seed

Carmen del Rio
Departamento de Olivicultura y Arboriculture Frutal, Centro de Investigación y Desarrollo Agrario, Alameda del Obispo, Apartado 240, Córdoba 14080, Spain

Luis Rallo
Departamento de Agronomia, Escuela Técnica Superior de Ingenieros Agrónomos, Universidad de Córdoba, Apartado 3048, Córdoba 14080, Spain

Additional index words. Olea europaea, propagation, greenhouse, mist

The development of seeded fruit attached to olive cuttings during the rooting period competes for assimilates and prevents rooting, even in a CO_2-enriched environment (del Rio, 1988). We determined whether the seed itself has a role in the inhibition of rooting in olive cuttings with fruit attached.

Cuttings were taken from the middle part of fruit-bearing l-year-old wood of 'Picual' olive trees, 60 days after full bloom. There were three treatments: cuttings with 1) fruit removed (FR); 2) two intact-seed fruit attached (IS); and 3) two killed-seed fruit attached (KS). Seed were killed by puncturing the fruit through the distal end (Stutte and Martin, 1986) before the cuttings were placed in the rooting medium. Cuttings, 14 to 16 cm long, with four leaves attached at the distal end, were treated with a 3000-ppm solution of indole-3-butyric acid and rooted in perlite held at 20 to 22C in a mist greenhouse (25 to 30C and 80% to 90% relative humidity). Observation of fruit diameter growth showed that seed were killed in 96% of the punctured fruits. There were four replications of 15 cuttings each in a randomized block design. After 2 months of rooting, the percentages of rooted and callused cuttings were recorded. Data were angular-transformed for analysis. In addition, 24 cuttings per treatment were prepared at the time of planting the cuttings. They were divided into three groups of eight cuttings each. The fruit and 3-cm basal section of each cutting were removed, dried (80C, 24 h), and weighed. Another 24 cuttings per treatment were randomly taken from the rooting experiment and treated as stated above to determine the distribution of dry matter at the end of rooting.

Killing the seed did not appear to affect the dry matter accumulation in the fruit during the rooting period, as final fruit dry weight was similar in KS and IS cuttings (Table 1). In addition, both types of cuttings showed a similar dry matter decrease in their bases relative to cuttings with fruit removed (Table 1), presumably due to the competitive effect of the growing fruit when it was attached to the cuttings. Therefore, partitioning of dry matter in KS and IS cuttings does not seem to explain the observed difference in their total rooting response. In KS cuttings, the percentage of rooted plus callused cuttings was higher than in IS cuttings, but lower than in FR cuttings (Table 2), suggesting an inhibitory influence of the intact seed on the total rooting response of the fruit-bearing cuttings not explained by the demand of assimilates by the fruit.

Table 1. Dry weight of bases and/or fruits of cuttings before and after the rooting period for cuttings with fruit removed (FR), intact seed (IS), or killed seed (KS).

Time of determination and type of cutting	Dry wt (g)[z]	
	Fruit	Base
Before rooting	3.97 ± 0.08	0.92 ± 0.06
After rooting		
FR	---	1.26 ± 0.11
IS	6.04 ± 0.47	0.66 ± 0.05
KS	6.47 ± 0.25	0.79 ± 0.10

[z]Mean ± SD of three groups of eight cuttings for each treatment.

Table 2. Effect of fruit with an intact (IS) or killed seed (KS) on the rooting of olive cuttings.

Type of cutting	Rooting response (%)		
	Rooted	Callused	Total
Fruit removed	26.2 A[z]	22.5 a	48.7 A
IS	0 B	1.4 b	1.4 C
KS	5.3 B	16.1 a	21.4 B

[z]Mean separation within columns by Duncan's multiple range test, lowercase letters (P = 0.05), uppercase letters (P = 0.01).

Received for publication 6 Jan. 1990. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.

Literature Cited

del Rio, C. 1988. Influencia de los hidratos de carbono y de la presencia del fruto en el enraizamiento de olivo por estaquillado semileñoso. PhD Diss., Univ. of Córdoba, Spain.

Stutte, G.W. and G.C. Martin. 1986. Effect of killing the seed on return bloom of olive. Sci. Hort. 29:107–113.