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IMPACT OF SEASON AND ROOTING HORMONE ON PROPAGATED OLIVE CUTTINGS IN OREGON

Olive Production And The Potential For Nursery Container And Field Diseases And Management Challenges In Oregon

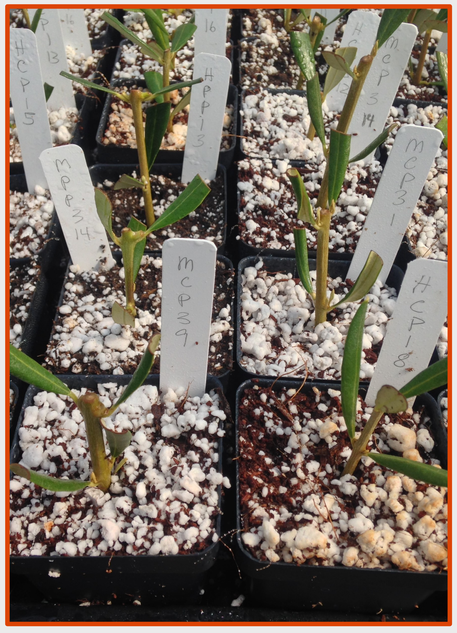
Background

Historically, the olive tree has been cultivated around the Mediterranean, where it can survive in arid conditions for long periods of time. Although generally a temperate climate, summers in western Oregon replicate semi-Mediterranean conditions conducive to growing olive trees. Within the state is an increased interest in growing olive trees, which could lead to new crop opportunities for Oregon's agriculture. Innovators within the industry are hoping to find a niche market for high quality and flavorful extra virgin olive oils in the state. However, techniques to improve orchard establishment need to be evaluated. Propagation techniques also need to be developed for our region to address plant cost for small farmers that want to propagate their own plants.

Methods

(PROPAGATION FOCUSED)

- Cuttings collected from "Arbequina" olives trees from a grower site.
- 2:1 peat-perlite media
- Automated mist and bottom heat
- Data collected 90 days later: combined root length, primary root number, and percentage rooted



Objectives

1. To evaluate transplanting and up-potting practices to assist with rapid orchard establishment by protecting potted plants during the winter
2. To identify propagation techniques in a greenhouse setting to determine best practices: media options, propagating season, hormone type and amount.

- Propagation season: Spring, Summer, Fall
- Hormone (Indole-3-butyric acid): 3000ppm IBA (referred to as "3H")
  8000ppm IBA ("8H")
  2000ppm IBA + 1000ppm NAA ("2D")
  4000ppm IBA + 2000ppm NAA ("4D")

Table 1. Effect of rooting hormone and rate combination on number of primary roots, total root length (cm) including all roots longer than 5mm, and rooting percentage for propagated Arbequina olive cuttings grown for 90 days under mist in a heated greenhouse, at the North Willamette Research and Extension Center, Aurora OR, spring 2019 (n = 96).

Treatments	No. of Primary Roots	Total Root Length (cm)	Rooting Percent %
Hormone x Rate[z]			
2D	2 ab	23 ab	54
4D	1 b	11 b	50
3H	4 a	35 a	83
8H	2 ab	20 b	71
Significance[x]			
Hormone-Rate	0.0192	0.005	NS

[Z] Hormone-rate combinations included: Dip n Grow 2000IBA + 1000NAA, Dip n Grow 4000IBA+2000NAA, Hormex 3000, and Hormex 8000.

[Y] Means followed by the same letter within the treatment or interaction are not significantly different ($P > 0.05$).

[X] P value provided unless nonsignificant (NS; $P > 0.05$.)

Table 1 shows results from 2019 spring propagation trial. Hormone rate shows significance in root number and root length. (graph by T. Barker)

Image shows the randomization of the cuttings. (photo by T. Barker)

Results

In 2018

- Single season show effect on root number and length significant in spring and fall (without misting).
- Seasonal evaluation shows interaction between season and hormone for root number and rooting percentage are significant.
- There is an importance in season and growing climate.

In Spring 2019 (shown in Table 1)

- Spring season show hormone rate effect on root number and root length.

Future Considerations

- Study is currently being repeated to verify results.
- After data analysis, season evaluations can be made to verify significance of growth season.
- Additional trial exploring the type and ratio of planting media with multiple cultivars can be made using results from season/hormone trial.

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Top image. Sticking olive hormone-fixed cuttings into varying ratios of peat-perlite media.
Middle image. Setting up olive cuttings on heated benches with overhead sprinklers.
Bottom image. Cuttings after root length and root number have been collected. Rooting percentage is subjectively calculated with analyzed data. (Top left is 3H, top right is 8H, bottom left is 2D, and bottom right is 4D)
(photos by T. Barker)

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