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Seasonal Effect on the Regeneration of Avocado Roots

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In removing avocado trees from the nursery, a greater or less proportion of the roots, depending upon the size and age of the plant, are necessarily cut off. After the trees are transplanted, the pruned roots eventually give rise to new rootlets. The approximate time required between root pruning and regeneration was the subject of an investigation during 1944, when each month individual roots were pruned and their activities observed. The following report shows that, under coastal conditions, root regeneration was most rapid when pruning was done between March and October.

Included in the investigation were Guatemalan seedlings in their third year in the nursery and Fuerte and Nabal trees on Mexican rootstock in their seventh year in the orchard. Limited observations, due to scarcity of trees, were made on Topa Topa seedlings in their third year in the orchard and Fuerte and Nabal trees on Guatemalan rootstocks. All trees were located in the orchard of the College of Agriculture, University of California, Los Angeles. The soil is classed as Yolo loam. The number of roots pruned on each tree depended on chance findings. About 6 inches of the upper side of each root was exposed with the under side remaining in contact with the soil. Before replacing the soil, the root was covered with a piece of plate glass (cut from discarded automobile windshields) for the purpose of making periodic observations possible without disturbing the root.

Guatemalan seedlings included Benik, Lyon, Carlsbad, Kashlan and Taft. From 1 to 4 roots per seedling were pruned each month or a total of 20. The diameter of the roots varied from 3/16 to $^{1}/_{2}$ inches, their location from 6 to 12 inches below the soil surface and 4 to 8 inches from the trunk.

One Nabal and two Fuerte trees on Mexican stock were used each month and from 1 to 3 roots on each were pruned, a total of 36 for the Fuerte and 18 for the Nabal. Root diameter varied from 3/16 to 1¼ inches, depth 8 to 20 inches and distance from the trunk 2½ to 6 feet.

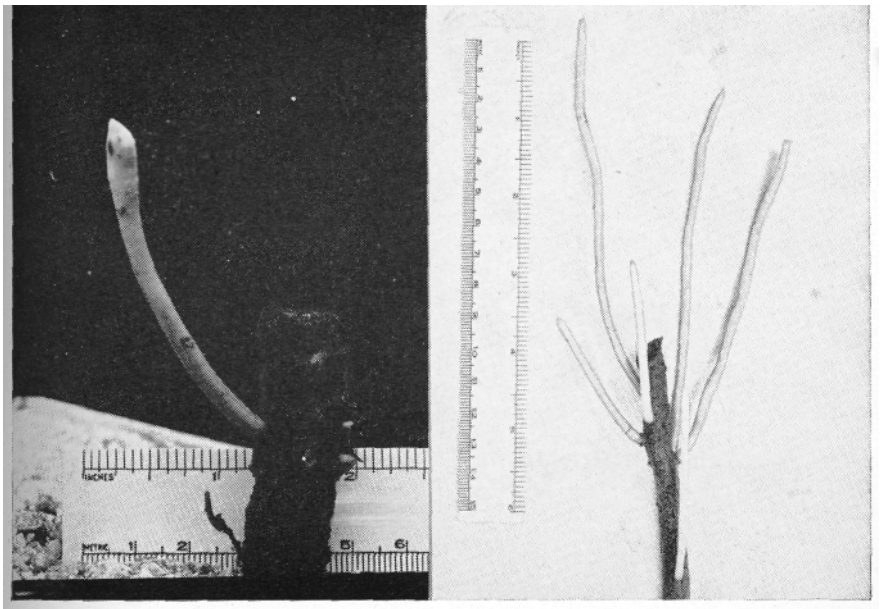

Fig. 1. Rootlets on root 6 months after it was pruned on January 12, 1944; rootlets up to ½ inch long were observed 3 months earlier.
Fig. 2. A close-up view of a rootlet.

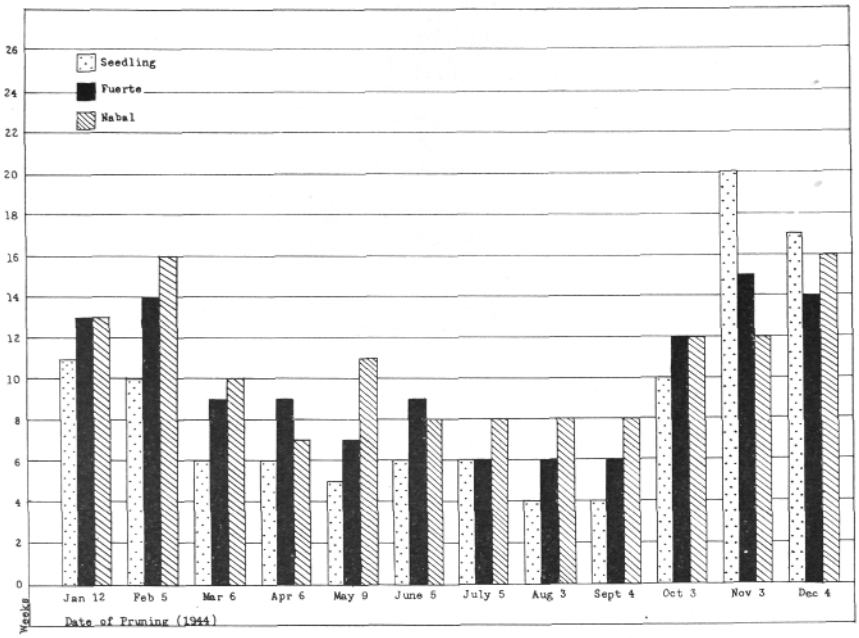

Fig. 3. Approximate number of weeks that elapsed between time of pruning and emergence of rootlets.

Figure 1 shows one of the roots 6 months after it was pruned on January 12, 1944; rootlets up to $^{1}/_{2}$ inch long were observed 3 months earlier. A close-up view of a rootlet on another pruned root can be seen in figure 2.

The approximate number of weeks that elapsed between time of pruning and

emergence of rootlets is given in figure 3. Where more than one root was pruned, the values represent averages. Only two roots, one on a Fuerte pruned in October and one on a Nabal pruned in December, failed to respond, at least as far as the visible portion (about 6 inches) was concerned.

Regeneration was most rapid when pruning was done between March and September. During this period the roots of the seedlings responded in less time (4-6 weeks) than those of the mature trees (6-11 weeks). In this connection it might be of interest to mention that pruned roots of young Citrus under Riverside conditions show a similar seasonal trend.[1]

The fact that root pruning between November and February merely delayed regeneration is in line with our observation to the effect that the transplanting of nursery trees during this period is not necessarily harmful. In the process of establishing rootstock trial plots, plantings made in November and January were as successful as those made in March, April and May.

Summary

Avocado roots, under coastal conditions, were found to regenerate new roots most rapidly when pruned between March and October. Pruning during other months caused no injury taut merely delayed new growth.

•Resigned July 1, 1946

1. Halma, F. F. Effect of season on the regeneration of sour orange roots. Calif. Citrograph 6, June 1921.