

tropical fruit that we know to be good and liked by most people, what is the future of not only the fruit but of the people who will try to grow it for a livelihood?

With the methods now employed by propagators, the grower finds that he can acquire planting stock and have bearing trees on a larger scale, cutting the time element by several years and the cost for trees manifold. But the best part is that the trees of most good fruits are available.

Yes, we have many good fruits yet to come. As long as trees bloom and bees hum, we can expect at least a different fruit.

South Florida is blessed with a year-round equable climate which has permitted many of these introductions to become well established, and are today accepted as a part of the daily diet of not only Florida, but the entire United States.

Now that we have the planting stock available, a ready market for the fresh

fruit, with freezing, canning and preserving methods worked out for most of the over-ripe or fruit that will not bring top price; the big question is, where will we find land to plant a grove of tropical fruit?

There are thousands of acres in South Florida that are still not subdivided suited for growing tropical fruit. But let's go out into the rural area, leaving room between our grove and town for two pre-fab subdivisions. It is the opinion of the writer that the part-time grower with a small acreage who is using this for a supplement or hobby is now finding himself in a very profitable and interesting business.

With the enthusiasm that has been shown from coast to coast in South Florida, and many of the problems already worked out for the growers who now have many hundreds of acres planted in tropical fruits, it is the opinion of many who are interested that we are beginning to see a great industry unfold in South Florida.

THE PROPAGATION OF SUB-TROPICAL FRUIT PLANTS BY CUTTINGS, A PROGRESS REPORT

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Coral Gables

Citrus and other commercial sub-tropical fruit plants are usually propagated by budding or grafting a scion of a desired clone onto a seedling rootstock. Since seedlings may vary, these rootstocks are not uniform with respect to scion-rootstock union, vigor, disease resistance, and other factors (1, 7, 17). Uniform rootstocks, having known qualities of scion compatibilities, disease resistance, effect on scion, vigor, etc., can only be produced asexually; that is, by cuttings, marcottage, stooling, or other

method. It is also possible to grow varieties as own-rooted plants produced asexually by the same methods.

Much work has been done at East Malling and other research stations toward the development of clonal rootstocks for the apple and other deciduous fruits (7, 18). The citron was propagated by cuttings in Italy as early as the seventeenth century, and the lemon in California over sixty years ago (2). Recently, Halma (5), Swingle and his associates (15), and others (3, 4, 8, 16) have propagated citrus and other sub-tropical fruits by cuttings, with good to partial success.

The present investigation of the root-

ing problems at the University of Miami has resulted in the adaptation of the constant spray method (11, 13, 14) for use in full sunshine (4, 10). The purpose of the present series of experiments was to determine if cuttings of commercial subtropical fruit plants could be rooted in a satisfactory percentage, and, if so, the best procedure for so doing. The rooting of cuttings is the practical approach to both problems: clonal rootstocks and own-rooted varieties.

Previous experiments with the constant spray method at the University (4, 10) were attempted in metal pans filled with sand or organic compost. It was determined to attempt rooting of cuttings with constant spray in the open, exposed to full sunshine, since carbohydrate manufacture proceeds at a faster rate in more intense light (9). Also, the constant spray permits the cutting to retain its leaves, by reason of the constantly maintained high humidity.

Method

The cutting beds were built on the ground, and are eight inches deep, four feet wide, and twenty-five feet long. Continuous irrigation is furnished by fan shaped nozzles spaced at two foot intervals along the sides, regular city water being employed. Media used were coconut fiber compost and the by-product of the green sand method of water softening. The latter is composed of spheres 0.5 to 5.0 mm. in diameter, and are produced when Calcium Carbonate is precipitated around a green sand nucleus. The structure allows free drainage, but the pH of 8.5 offers a possible objectional feature.

Cuttings were made of hard, soft, and intermediate wood, all cuttings being approximately eight inches in length. Leaves were removed from the lower third of the cutting, leaving as much leaf surface as possible for maximum photosynthetic effect.

Attempts to bud and graft simultaneously with rooting of the stock (5, 6) were made. Buds, cleft grafts, tongue grafts, and other grafts were used, the stock cutting in all cases being Rangpur lime.

Results

Results indicate that a commercially satisfactory percentage of citrus cuttings can be strongly rooted in six to eight weeks. Cuttings of other commercial fruit plants have rooted in sufficient quantity to merit further experimentation.

Wood in the intermediate stage gave the best results, i.e.: that recently matured growth, which, in citrus, is that wood which is losing its angularity. Green, immature growth was very prone to rot; while the older hardwood either failed to callus, or dropped leaves excessively, and failed to root after producing a slight callus.

Most of the simultaneous grafts and rooting failed. Difficulty has been experienced in budding and grafting onto the Rangpur lime rootstock in the experimental plots, and it is felt that failure may be traceable to other causes than the method.

Results are given in tabular form. The large variations are due in part to the type of wood, time of year, and to the differences in rooting media.

It should be noted that, during the course of the experiment with avocados and mangos (except the Collins var.), the irrigation was interrupted for forty-eight hours, and all cuttings suffered severe to total leaf loss because of sunscald. All cuttings which rooted did so in the Calcium carbonate medium, coconut proving unsatisfactory. Of those which failed to root in the Calcium Carbonate medium, Litchi is the most notable, since the cuttings, without exception, formed a heavy callus, but failed to root, even after twelve

TABLE 1.
SIMULTANEOUS GRAFTING AND ROOTING.

Scion	Stock	Total	No. Rooted	Time
Idemore lime	Rangpur lime	30	1	6 weeks
Persian lime	Rangpur lime	30	4	8 weeks
Valencia orange	Rangpur lime	30	0	
Oneco tangerine	Rangpur lime	30	0	

TABLE 3.
OTHER SUB-TROPICAL FRUITS.

Variety	Total Cuttings	No. Rooted	Time
Idemore lime	21	11	6 weeks
	33	23	8 weeks
Persian lime	25	16	6 weeks
	33	23	8 weeks
Rangpur lime	52	9	6 weeks
	30	29	6 weeks
	30	19	8 weeks
	30	22	8 weeks
	30	30	6 weeks
	300	182	8 weeks
Oneco tangerine	12	0	
Valencia orange	16	0	
Rough lemon	59	58	6 weeks

TABLE 2
CITRUS CUTTINGS.

Variety	Total Cuttings	No. Rooted	Time
<i>Antidesma bunius</i>	137	92	8 weeks
Avocado, Costa Rican var.	78	0	
Litchi	67	0	
Avocado, Hawaiian var.	340	0	
<i>Malpighia puniceifolia</i>	121	0	
Mango, var. Alphonse			
Mango, var. Bennett	98	0	
Mango, var. Borsha	58	0	
Mango, var. Collins	47	11	6 weeks
Mango, var. Haden	60	0	
Mango, Julie	54	0	
Mango, var. Paheri	123	0	
Mango, var. Saigon	40	0	
<i>Myciaria jaboticaba</i>	78	1	8 weeks

weeks. Avocado behaved similarly in the compost medium. The failure of Oneco tangerine and Valencia orange to root points out the inadequacy of the material; young, angular wood only was available. As the technique of choosing the proper wood, and, perhaps, of making the proper cut, improves, doubtless the ratio of rooted to unrooted cuttings will continue to increase.

Summary

Research into the rooting problem has lead to the adaption of the constant spray method to full sunshine. This method appears to be a satisfactory method of rooting sub-tropical fruit plants if free drainage is provided in the medium. Cuttings give best results if only the bottom third of an eight inch cutting is stripped of its leaves. Promising results were obtained from citrus cuttings, while results with other fruits merit further experimentation.

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WEED CONTROL STUDIES AROUND YOUNG AVOCADO TREES

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Introduction

On the oolitic limestone soils of Dade County, newly planted avocado trees seldom grow as fast on old citrus land as on freshly scarified pineland. In some groves, the majority of the young

trees have failed to grow at all and have eventually died. However, after the trees are well established, they grow very well on the old citrus land.

This difficulty sometimes occurs after compensating for the minor element deficiencies of the soil. Raw pineland apparently contains enough magnesium to supply young avocado trees for at least a year or two, while land that has had orange or grapefruit groves is generally