

## AVOCADO ROOTSTOCKS RESISTANT TO PHYTOPHTHORA CINNAMOMI

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This is a progress report on the current status of a number of our field plots to test rootstocks for resistance to the avocado root rot fungus, *Phytophthora cinnamomi*. During the past five years, with the assistance of funds provided by the California Avocado Advisory Board under the avocado marketing order, we have established many field plots to test resistance, in all of the avocado producing counties. Over 5,000 trees are involved in this program.

These plots, ranging from 50 to 200 trees in size, have all been established in areas where the avocado trees have died or been removed because of *Phytophthora* root rot. In most cases a small area (usually 4 ft. by 4 ft.) around the new planting site was treated with a soil fumigant several months prior to replanting the new tree. This was to enable the young tree to become established before the root rot fungus re-invaded the site.

Most of the trees used in these plots were propagated by E. F. Frolich in the greenhouses on the Los Angeles campus of the University of California. The great majority of these were propagated as rooted cuttings, to establish the rootstock as a uniform clone.

The emphasis in these plots has been on the Duke seedlings (Duke 6 and Duke 7) that were selected a number of years ago by G. A. Zentmyer and have been propagated as

rooted cuttings. The other rootstocks listed in the tables are identified as follows: Duke Parent—from the Duke variety (originally from Oroville, California from seed collected in Mexico), Duke S—a Duke seedling from Fallbrook; Duke Grace—another Duke seedling from Fallbrook; G-22—a Guatemalan seedling brought in from north-central Guatemala by G. A. Zentmyer; Scott—Mexican rootstock of a Fuerte tree in Orange County; Huntalas—rootstock from a Fuerte tree in Vista; Topa Topa—seedlings from the Topa Topa variety, a commonly used rootstock in California, originally selected on the Topa Topa ranch in Ojai. We include Topa Topa in most of our rootstock trials as it is very susceptible to root rot, and provides a good control tree.

The following tables give the current status of a number of our plots in San Diego, Santa Barbara, and Ventura counties. We have additional plots in Riverside, Orange, Los Angeles, and Tulare counties; most of these have not been established as long as those listed here.

These data indicate, as has been a trend in our other plots, that the Duke 6 and 7 clones have at least moderate "field" resistance or tolerance to root rot, and that they have considerably more resistance than Topa Topa. There are indications of some similar resistance in G-22, although this collection has varied considerably in growth responses in different plots. Most of the Duke clones have some resistance, although the Duke S and Duke Grace do not generally have as much resistance as do Duke 6 and Duke 7.

Initial results with Huntalas look encouraging. We have more trees on this clone in more recent field plots so will have a better basis for assessing its resistance soon. Another new selection G6 from Guatemala, although not included in the plots summarized here, also is showing moderate resistance and considerable vigor in the initial field tests.

There is a disturbing trend in several of the plots, with the topworked trees in several instances apparently less resistant to root rot than the same rootstock not topworked. In other crops there are indications that the scion may have an effect on the resistance of a rootstock to disease. We are studying this aspect further.

PLOT 1—FALLBROOK—PLANTED SEPTEMBER 1969

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #6	45	3	93.3
Fuerte/Duke #6	45	15	66.6
Fuerte/Topa	18	16	11.1

*Planting sites treated with Mylone. Above trees were all topworked to Reed on March 16, 1976.*

PLOT 2—FALLBROOK—PLANTED MAY 1973

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #6	10	0	90
Duke #7	10	1	90
G-22	10	1	90
Hass/Duke Grace	10	4	60
Hass/Topa	10	8	20

*Planting site treated with Mylone.*

PLOT 3—FALLBROOK—PLANTED MARCH 1974

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Huntalas	10	1	90
Duke #7	10	3	70
G-22	10	4	60
Hass/G-22	10	3	70
Hass/Topa	10	9	10

*Planting site treated with Mylone.*

PLOT 4—FALLBROOK—PLANTED JUNE 1975

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #6	16	0	100
Duke #7	16	0	100
Hass/Huntalas	16	1	93.7
Hass/Topa	16	4	75

*Planting site treated with Mylone.*

PLOT 5—VISTA—PLANTED MAY 1974

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #6	25	8	68
Hass/Duke #6	25	9	64
Hass/Huntalas	25	8	68
Hass/Topa	15	13	13

*No pre-plant treatment for planting site.*

PLOT 6—SANTA PAULA—PLANTED SEPTEMBER 1970

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #6	15	0	100
Duke #7	15	0	100
Duke Parent	15	0	100
Duke S	15	0	100
G-22	15	2	86.6
Scott	15	2	86.6
Topa Seedling	15	9	40

*Planting site treated with Mylone. Trees topworked in 1975.*

PLOT 7—CAMARILLO—PLANTED SEPTEMBER 1971

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Hass/Duke #6	30	12	60
Duke #6	15	2	86.6
Duke #7	15	5	66.6
Duke Grace	15	4	73.3
Hass/Duke Parent	15	5	66.6
Topa Seedling	15	11	26.6

*Planting site treated with Mylone.*

PLOT 8—GOLETA—PLANTED SEPTEMBER 1974

Variety	Number Planted	Number with Root Rot Symptoms	Percent Healthy
Duke #7	15	3	80
Hass/Duke #7	15	0	100
Hass/Huntalas	15	1	93.3
*G-22	15	7	53.3
Hass/Topa	15	8	46.6

*\* This selection suffered from a freeze the first winter.  
Sites pre-plant treated with Vapam.*