

# Avocado Rootstocks

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Subtropical Horticulture

# Rootstocks in California

- Commercial avocados are not grown from seedlings...all are grafted onto rootstocks that have been selected for some characteristic
- In California, all rootstocks are from the Mexican or Guatemalan race, the West Indian is too sensitive to cold
- Most rootstocks are 'Topa-Topa' or 'Zutano' because they germinate uniformly in the nursery and provide thick stems for tip-grafting
- Both are susceptible to root-rot fungus and salinity

# The Program to Select a Rootstock

- Started by Dr. George Zentmyer at UC Riverside in the early 1950's
- Screened seed from Central America and Mexico, collected seed from 'escape' trees in California
- Starting in 1990 Dr. John Menge crossed these trees in 'isolation' blocks and tested these seed
- Duke 7, G 1033, G6, G755, Barr Duke, Thomas, Zentmyer, Uzi and Steddom, and breeding material for the future
- Imported Dusa from S. Africa

# What about other Horticultural Characteristics?

- High yield, salt tolerance etc?
- G755 was highly tolerant to root rot, but gave the Hass top almost no production in the first five years, very little after that
- Now we are testing salt-tolerant West Indian selections from Israel, and Dusa looks good for salt-tolerance and root rot tolerance
- See Table 1 (p. 47) - Characteristics

# Things to do to Assure Success During Replanting

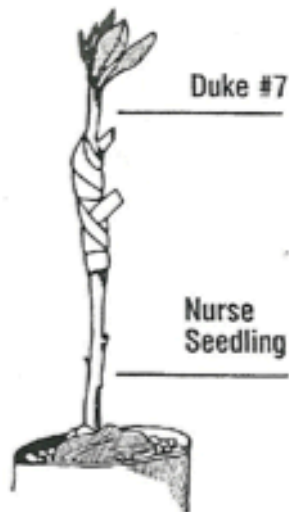
- Drench the root-ball with a solution of buffered phosphorous acid, plant in a mound to increase drainage, mulch with wood chips, apply gypsum (calcium sulfate)
- Water correctly (can be tricky!)

# Cloning Rootstocks

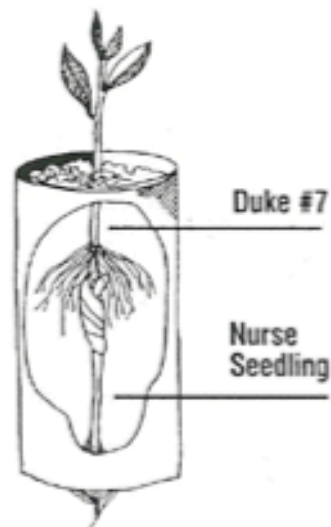
- Root rot tolerance usually does not pass through to the seedling from the mother tree
- Avocado cuttings will not root
- **Cloning process:** budwood from Duke 7 is grafted onto a seedling rootstock
- After 6-8 weeks, young plant is placed into a dark greenhouse for 10 days
- Etiolation of young shoot occurs, rooting hormone applied to young shoot, re-potted so bottom of Duke 7 is buried, placed into light
- Hass grafted onto Duke 7
- Constriction ring placed around Duke 7 to eventually constrict off roots



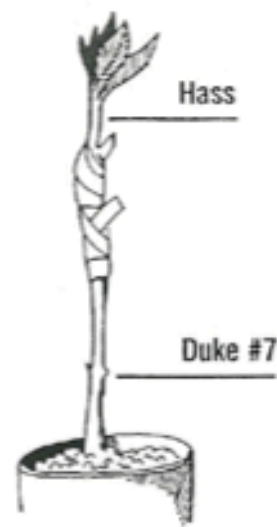
We start by growing a seedling that will be used as the 'nurse'.



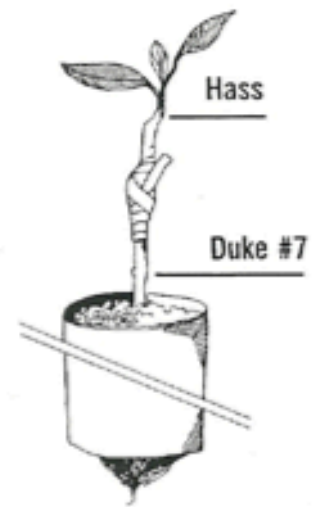
Bud-bearing tissue from cloned rootstock is grafted to the 'nurse'.



Roots are forced to grow from the clonal rootstock.



Fruiting scion (Hass, etc.) is grafted onto the clonal rootstock.



The original 'nurse' is disconnected from the clonal rootstock.

# Highest Yielding Rootstocks

- See Figure 1, p. 49
- Borchard and Duke 7 highest yielding
- G755, Thomas, G1033 lowest yielding
- Dusa was not included in the trial



# Somatic Hybrids

- Protoplasts to Embryos from avocado can be created on a Petri plate with the proper solution
- Protoplasts to Embryos can also be created from wild avocados (*Persea borbonia* for instance)
- And the two protoplasts can be combined
- But they are having trouble bringing these back to a tree

*The Goal: Persea americana x Persea borbonia*

