Vegetable Grafting

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What is Grafting?

- Scion
- Rootstock
- Grafting and graft union
- Compatibility of grafting

Grafting is an old technology!

- Grafting is an ancient technique, especially with fruit crops.--Dicots
- Vegetable grafting was recorded in a book from the 5th Century in China with *gourds*.
- Commercial grafting of vegetables was with watermelon in 1936, using squash as rootstock.
- Vegetable grafting is a common practice in Asia and some European countries.
- Veggie grafting has been increasing in the US, especially with tomatoes (Heirlooms).

Advantages of Veggie Grafting

- Resistance to Diseases, especially the soil-borne—The phase out of Methyl Bromide Fumigation:
  - Fusarium wilt: melon, cucumber and tomato
  - Bacterium wilt: tomato, eggplant.
  - Verticillium wilt: tomato.
- Resistance to root-knot nematodes: cucumber, melon, watermelon, tomato, eggplant.

Advantages of Veggie Grafting

- Grafting can transfer resistance against the carmine spider mite from *Lagenaria* rootstocks to *Cucurbita* scions.
- Moreover, some rootstocks can render grafted plants resistant to some viruses.

- To take advantage of the strong and cold-hardy or heat-resistant root systems; and to increase nutrient uptake.
- To adjust scion growth.
- To increase fruit size, yield and quality (tomato cracks).

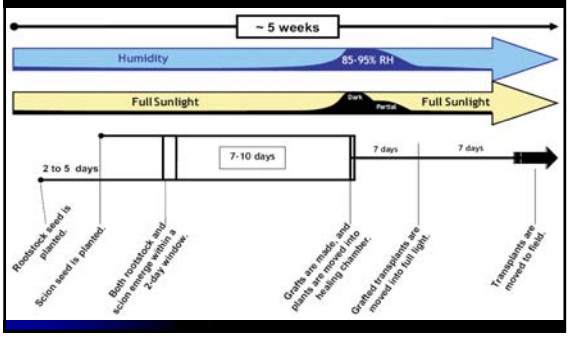
Disadvantages of Grafting

- **Cost**
  - Labor if manually (300-500 tomatoes/hour)
  - Cost for a Robot if automatically
  - Cost for rootstock: not cheap
- **Incompatibility**
- **Fruit quality could be down:** not all rootstocks are good!

Grafting Methods

- Vegetable grafting is relatively easy, as vegetables are herbaceous in nature.
- Grafting usually for high tunnels or other greenhouse—economic reasons.
- Grafting occurs with warm season vegetables for high profit—tomato, water melon, melon, cucumber.
- Heirloom scion varieties are encouraged for quality and profit.—Traditional reason?

Tomato grafting: a typical timeline

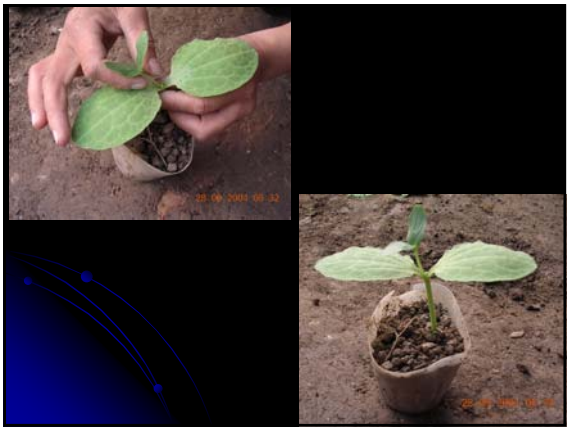


- Rootstocks
- Scions
- Razor blades
- Clips
- An “incubator”

Silicon tubes

Tomato: Tubing grafting method

Cucumber: Insertion Method

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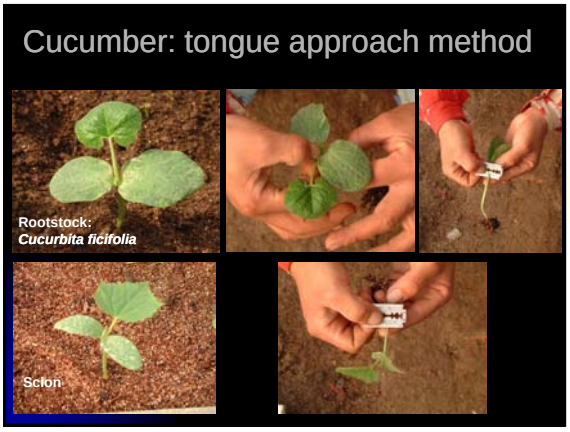
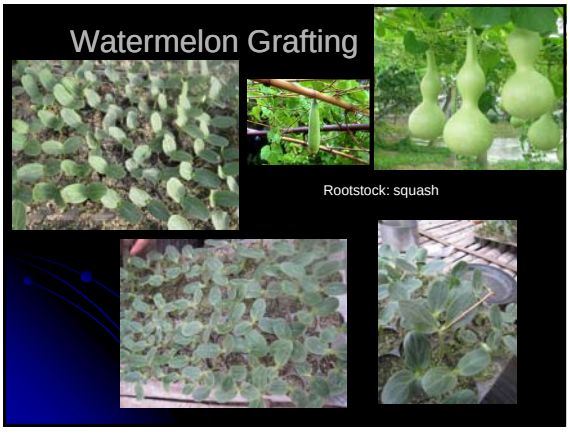

Cucumber: tongue approach method
Rootstock:
Cucurbita ficifolia
Scion


Rootstock
Scion

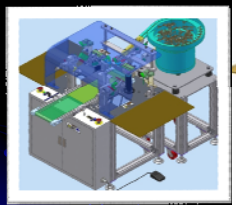

Watermelon Grafting
Rootstock: squash


Water melon seeds


Squash--
rootstocks

Eggplant: Cleft Method

Grafting Robot: watermelon and tomato



Questions!

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