GRAFTED TOMATO IN VIETNAM, FROM 0 TO 7,000HA/YEAR

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VIET NAM

102-109 Longitude, 8.42-23.39 Latitude, 310,000 Km², 94,104,000 people
2 largest tomato areas

The Red River Delta Zone

The Central Highland Zone

# 20,000 ha
BACTERIAL WILT
(R. solanacearum)

DAMAGE 20-30%
MAYBE 100%
From 2002 to 2004, a group of researchers led by Dr. Ngo Quang Vinh studied grafting commercial varieties (scions) on Bacterial resistant varieties (rootstocks).

1/ HW7996 (AVRDC’s) is a variety highly tolerant to *Ralstonia solanacearum*.

2/ *Technique to graft*

From 2004, new technique was transfer to Lam Dong farmers.
LAM DONG PROVINCE
- 1200-1500 m/sea level, 22-27°C
- 6500-7000 ha tomato/year
TRAINING ON TOMATO GRAFTING
Number of tomato grafting was increased fast, providing enough to grafted tomato area, increasing from 0ha to 100, 1000, 3000, 5000, 6000 ha/year, year by year.
So far, in Lam Dong, about **80** tomato grafting farms have been set up, producing around 240 million grafted tomato seedlings, providing to **6500-7000** ha commercial tomato annually.
Tomato area grown by grafted seedlings by years
Profit and household incomes

- Yields from 40 tons/ha (non-grafted, before applied technique) to 60-80 tons/ha

- Total sales: 31,300 USD/ha for farmers using grafted tomato, compared to 11,534 USD/ha for non-grafted tomato.

- Revenues from grafted tomato: 15,751 USD/ha higher than non-grafted tomato.

- The benefit-cost ratio: 4.6 for grafted tomato and 3.5 for non-grafted tomato.

- An average 5000 m² seedling farm, producing 3-4 million grafted seedlings/year, gets 24,000 USD/year.
REWARDS

"The first prize in Contest of Creating Science & Technology of Ho Chi Minh City, 2004-2005" awarded by HCMC People Committee, 2005


"Technology Creating Medal" awarded by Labour Union of Vietnam 2005

With “Solution of controlling Bacterial wilt tomato by grafted seedlings and grafting technique in Tropical condition”, Dr. Vinh and his staff were rewarded noble rewards in National contests of “Creating Science and Technology”
Grafting technique
Grafted tomatoes (left) and non-grafted (right) in our experiment

Grafted tomato gave nearly 100% resistance to bacteria caused wilting. **HW7996 (AVRDC’s)**, a variety highly tolerant to *Ralstonia solanacearum* is used for rootstock.
Good seedlings, raising by good technique (in plastic houses) are used for grafting.
Rubber tube with 13mm long and 2mm inner diameter are used to graft. The tubes will hold firmly connecting sites and expand following the growth of plants.
Cut the rootstock above cotyledons at a 45 degree angle.

Cut the scion stem at 45 degree angle also, above the first true leaf.

Slide a rubber tube over the scion stem. Push the scion about halfway into the tube.
Slide the scion (now fitted with the rubber tube) over the rootstock seedling stem.

Gently push the scion and rootstock together.
During grafting duration, spray very fine drop water every 10-15 minutes on grafted seedlings until they are moved into shade room.
Immerse seedling tray into water before arrange on floor

Spraying very fine water drops for 2-3 times/day (3 days in here)
Grafted seedlings replaced into plastic house with shading for 4-5 days

Remove shading and care as normal seedling for 4-5 days
Grafted seedlings are ready for transplanting at 12-13 days after grafting
Experiences /lesson

1. Good and suitable technique
2. Good place to transfer technique
3. Low input-cost
4. Mechanization
1. Good and suitable technique

a/ Good organization of grafting farm

Functioning areas in a grafting farm
Functioning areas of a tomato grafting farm

- A: raising seedling for grafting
- B: doing grafting
- C: 3 day post-grafting house
- D: 9-10 day post-grafting
b/ Good and suitable technique

Good seedling for grafting

Doing grafting

Spray water every 15min.

Care and hardening grafted seedling

Care seedling in cool house
2. Good place to transfer technique

**Lam Dong:**
- 30,000 ha vegetables/year
- Largest tomato area in country (3500 ha tomato, 2003)
- Bacterial wilt is big problem
- Big potential for implementation (tomato area could be 7000-8000ha)
- Farmers have experience in seedling production
3. **Low input cost**

a/ Farming operators have low prices rootstock-seeds and rubber tubes for grafting
b/ Farmers produce themselves media for raising seedling
c/ Plastic house with low cost are used in seedling production
4. Mechanization in production