A short history of tomato grafting in the greenhouse industry
My history, my grandfather

- Established his greenhouse business in the early 50’s.
- Concrete structures with glass in tar.
- Manual climate control.

- Course in pest and disease control 1961
Greenhouses 1960’s

Oostvoorne, The Netherlands

Crops:
- Grapes
- Lettuce
- Field vegetables
Grafting 1960’s

- Gutter connect greenhouses offered the possibility to grow larger areas of the same crop under glass.

- Soil fatigue - Production crops such as tomatoes in soil, in the greenhouse, year after year, led to nutrient deficiencies and recurrence of disease. These were the early years of actual greenhouse production in the Netherlands.

- Diseases such as Corky root, Verticillium, Fusarium and the lack of resistant varieties at that time.

- The first grafting method used on a “commercial scale” for the greenhouse industry in The Netherlands was the “Brielse method”.

- Grafting happened at the greenhouses as propagators had not been established yet.
My history, my father

Built his first greenhouse in 1963.

This first greenhouse was heated with kerosene heaters.

Switched to hot water heating using heavy oil early 70’s.

Produced tomatoes, lettuce, cucumbers and french beans.
“Brielse Method” or Approach grafting

In this image:

- Rootstock is on the right.
- Scion is on the left.
- Plants are transplanted side by side.

Rootstock is cut from top down.
Scion is cut from bottom up.
Stems are combined and taped.
Once the wound has healed top is removed from the rootstock.

A few days later the root of the scion is cut. Often a piece was removed to avoid re-growth.
1970’s and 1980’s

The need for grafting diminished due to:

- Improved varieties: Resistant to Corky Root, Fusarium
- Use of Methyl Bromide and Vapam to prevent Corky Root and Fusarium.
- The ability to now steam greenhouse soils.
- Increased use of crop rotation.
- Transition from soil production to hydroponic production during the late 1970’s
The late 1990’s

Grafting is re-introduced to the greenhouse industry due to:

- The constant drive to produce more kilo’s per square meter.
- High wire systems using one planting per year, with plants 15 meters in length by the end of the crop, requiring a better root system.
- Improved fruit quality.
- The ability to influence the vegetative/generative habits of a variety.
- The rapid introduction of new varieties.
Japanese method or Tube Grafting

Disadvantages
- Precision work, plants are ideally grafted at 12-14 days after seeding.
- Excellent climate and crop management are required for the first five to seven days after grafting.
- The need to produce rootstock and scion seedlings that are close to the same in diameter.

Advantages
- Less labour intensive compared to the Brielse Method.
- Success rate is known within days after grafting.
- No grafting related actions required after the actual grafting.
- Lower risk of the development of advantageous roots out of the graft area.
Current Process to produce a grafted and pinched tomato plant.

**Steps:**

1) Seeding of rootstock  
2) Seeding of scion  
3) Grading of rootstock  
4) Grafting  
5) Transplanting  
6) Pinching  
7) Sticking  
8) Spacing  
9) Clipping  
10) Shipping
Seeding of rootstock and scion

- Drum seeder
- Vermiculite covering
- Optional watering pre and post vermiculite.
Germination Area

For the greenhouse industry seeds are sown using primarily rockwool kiemplugs.
Rootstock Grading

To generate trays of rootstock seedlings that are consistent in size.
Grafting

- Manually grafted at 250-300/hour.
- Placed into tents for 4 to 7 days.
- Gradual climatization.
- Extreme hygiene protocol in place.
Automatic Grafting

Full automatic except for scion placement in machine.

Possible continuous hygiene actions.

Proven robotics.

Single person operated for 1000 grafts/hour.
Grafted plant for field production
Grafted plant for Organic production.

Ellepot plug filled with organic media.
Transplanting
High graft vs Low graft
Pinching

45 day
Spaced
Ready to ship
Thank you