



UNIVERSITÀ
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Vegetable grafting and cultivation in Europe

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Vegetable grafting

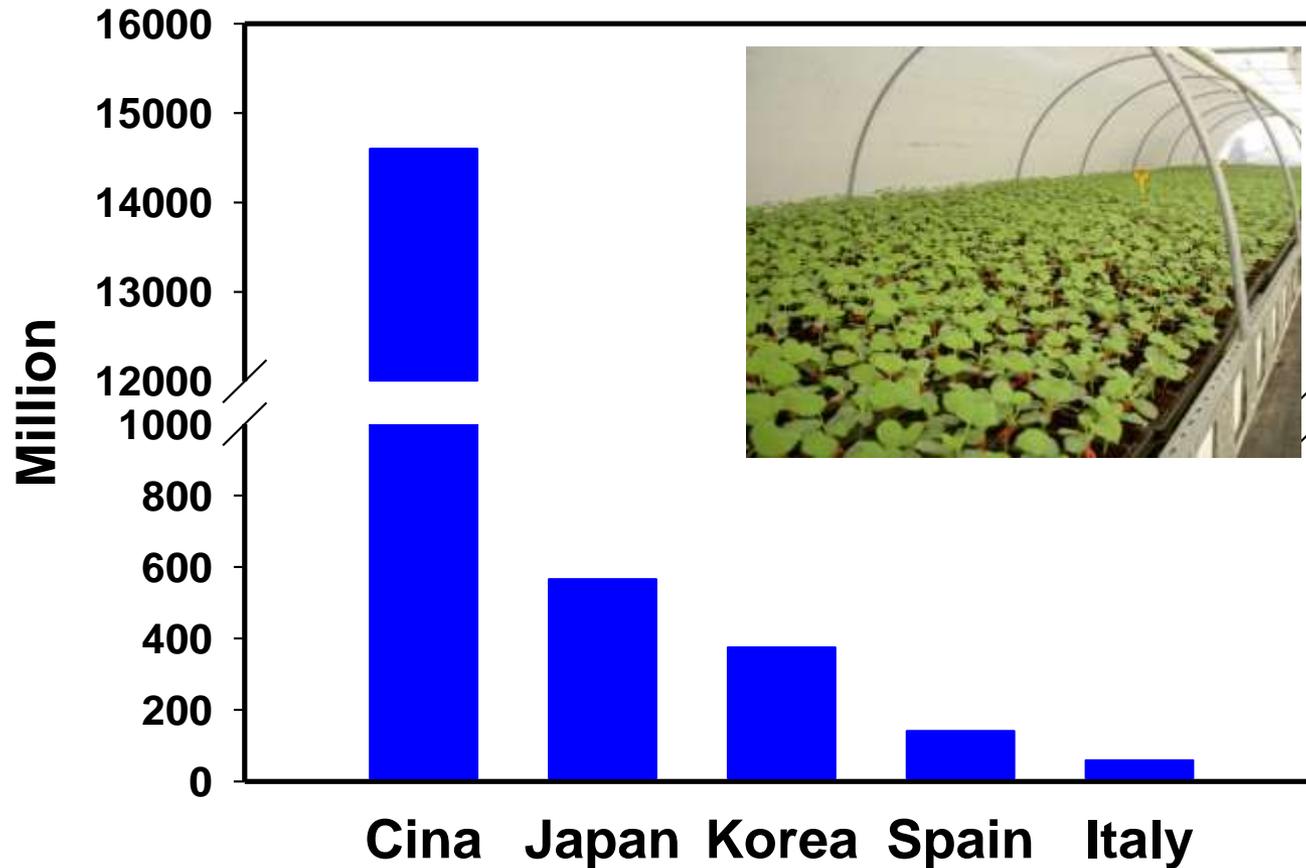
In European countries the cultivation of grafted plants was introduced in 1947 by the Dutch growers who started to graft cucumbers.

In In 1962 the first commercially grown grafted tomatoes appeared in Europe but only after the 1990 the use of grafted plants in *Cucurbitaceae* and *Solanaceae* crops increased significantly in many European Countries (Spain, Italy, Greece, France, Netherlands).



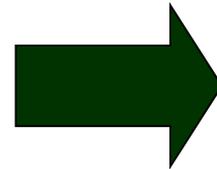
Diffusion:
- World

Production of vegetable grafted plants



(Lee et al., 2011 and other sources)

- Increase in the incidence of soilborne diseases due to the intensification of vegetable cropping systems
- Ban of methyl bromide and the restriction on the use of pesticides
- The growing interest of consumer on high quality vegetables and on environmentally-responsible production systems

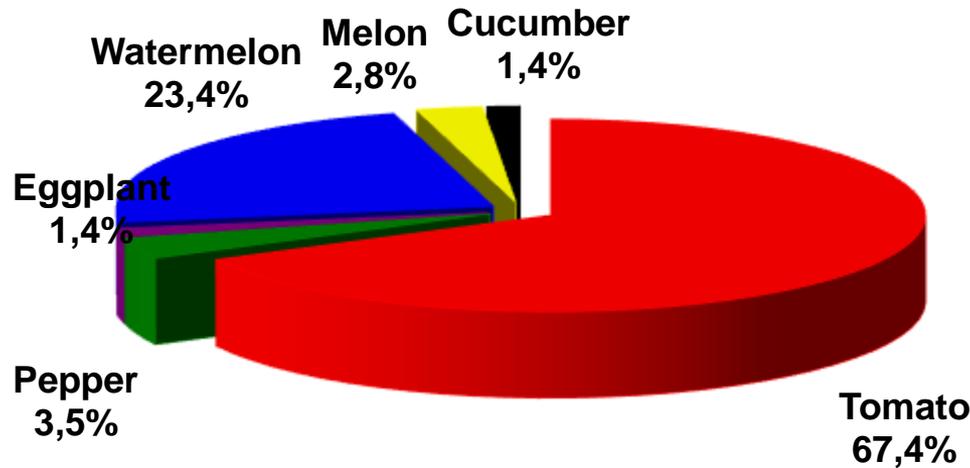


Diffusion:
- Spain



Total grafted plants produced

90 million (2005) → 140 million (2009)



70% of total grafted plants are used in Murcia and Almeria areas

Data provided by Alfocea Francisco-Perez

Diffusion:
- France



Production area using grafted plants

Melon: 100%

Cucumber: more than 80%

Tomato: 36% in 2006 to 80% in 2011

Eggplant: 10% in South-Est France



Data provide by Brachet Marie-Lisa

Diffusion:
- Greece



Production area using grafted plants

Early watermelons under low tunnels: 90-100%

Early melons under low tunnels: 70-80%

Cucumbers: 10-20%

Tomato and eggplant: 5-15%

Pepper: 1-3 %

Grafting of vegetables is getting popular especially in South West Peloponnese area.



Diffusion:
- Netherlands



Production area using grafted plants

Tomato: 97% is grafted and used in high tech greenhouses (1500 ha)



Data provide by Martijn Stee, van



**Genetic materials:
- rootstocks**

**Main rootstocks
for each vegetable crop**

Crop	Rootstock	
Watermelon	<i>Lagenaria siceraria</i>	<i>C. maxima</i> × <i>C. moschata</i>
Melon	<i>C. maxima</i> × <i>C. moschata</i>	<i>Cucumis melo</i>
Cucumber	<i>C. maxima</i> × <i>C. moschata</i>	<i>Cucumis sativus</i>
Tomato	<i>S. lycopersicum</i> × <i>S. habrochaites</i>	<i>S. lycopersicum</i>
Eggplant	<i>Solanum torvum</i>	<i>S. lycopersicum</i> × <i>S. habrochaites</i>
Pepper	<i>Capsicum annum</i>	

- *Conclusion and future prospects*

Grafting technique is a recent innovation in Europe and it is likely a strong increase in the use of grafted plants in the next years.

However, several critical issues must be solved to promote the wide use of vegetable grafting technique:

- the incomplete resistance of rootstocks to some biotic and abiotic stresses;
- the grafting incompatibility in some scion-rootstock combinations;
- the detrimental effects on fruit quality caused by some rootstocks;
- the high cost of grafted plants.