

## PRACTICE ABSTRACT 9

### Grafting tomato to increase seed production

Grafting of tomatoes has the potential to increase tomato seed production under organic conditions. Grafting means to combine the positive characteristics of a rootstock (e.g., increased vigour, resistances to soil-borne diseases) with the positive characteristics (e.g., fruit quality, taste) of the upper part of the plant (scion).

We compared the seed production of three tomato cultivars: 'Benisoda', 'Berner Rose' and 'Rosa de Barbastro', which were either non-grafted (NG), or grafted on 'Emperador' (Rijk Zwaan) or on a BRESOV rootstock (interspecific hybrid *S. glycopersicum* x *S. habrochaites* provided by UPV, Spain).

Plants were grown under organic conditions in the greenhouse at Terre d'Essais, Brittany, France. Fruit number and weight were measured throughout the season of 2021. Seed weight, number and Thousand Seed Weight (TSW) were assessed on the first two bunches. Overall seed production was extrapolated based on total fruit production.



Seed production trial with grafted and non-grafted plants at Terre d'essais (left) and grafted and ungrafted seedlings (right) (Hervé Floury, Terre d'Essais)

Yields varied between 8.1–20.0 kg/sqm and seed production between 30.6–98.0 g/sqm (Fig. 1 and Fig. 2). Grafting increased yield and therefore seed production, regardless of variety and rootstock tested. No differences were established between rootstocks. Grafting increased seed production by about 60%. The increase in seed production observed on grafted plants was related to the increase in yield, i.e., number of fruit and fruit weight, rather than the number of seeds per kg of fruit which was slightly reduced by grafting.

These results confirmed the interest of grafting which is already widely used by greenhouse tomato producers to increase plant vigour and resistance to soil borne diseases and pathogens. In addition of protecting plants against diseases or soil borne pests and pathogens, grafting usually leads to stronger plants with higher agronomic potential with more and bigger fruits, less blossom end rot and other waste fruits and an increased resistance to heat. Grafting can also extend plant lifetime, leading to a higher production of bunches, fruits and therefore seeds. We therefore recommend grafting for the seed production of population varieties.

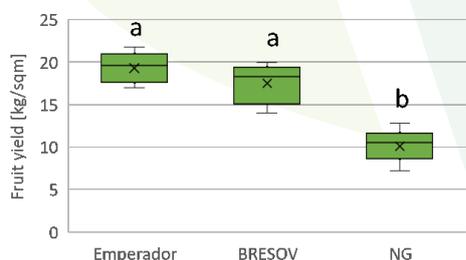


Fig. 1: Fruit yield [kg/sqm] in grafted and non-grafted (NG) lines.

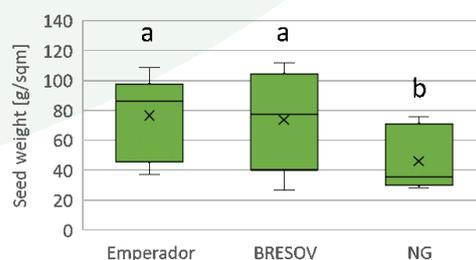


Fig. 2: Seed production [g/sqm] in grafted ('Emperador' and 'BRESOV') and non-grafted (NG) lines of fruits of the 1<sup>st</sup> and 2<sup>nd</sup> bunch.

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#### THE AUTHORS

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Thibault Nordey is an agronomist holding a doctoral degree in plant physiology. After ten years of research at the CIRAD on tropical vegetable productions, he has taken over the management of Terre d'Essais - SECL in 2020.

Amelie Detterbeck is an agronomist with a strong interest in seed sciences, holding a doctoral degree in plant physiology. After her studies she joined Euroseeds, the voice of the European seed sector, as a researcher for the BRESOV project.



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#### THE PROJECT

### BRESOV SHAPING THE FUTURE OF ORGANIC BREEDING & FARMING

BRESOV aims to tackle the nutritional challenges of a growing world population and changing climatic conditions by enhancing productivity of different vegetable crops in an organic and sustainable farming infrastructure. BRESOV works on broccoli, snap bean and tomato as those staple vegetable crops have significant roles in meeting our global food and nutritional security goal, and under organic conditions can contribute to storing carbon, introduce nitrogen and improve organic soil quality.

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