UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

PhD Workshop 2018

Doctorate School in Agri-Food Sciences, Technologies and Bio-Technologies

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Innovative strategies and environmentally friendly management practices for the production of processing tomato (*Solanum lycopersicum* L.)

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Introduction

- ✓ **Tomato** (*Solanum lycopersicum* L.), after potato, is the **main cultivated horticultural crop** in the world (FAOSTAT, 2018).

- ✓ **Italy** is the **European leader** in the production of **processing tomato** (FAOSTAT, 2018).

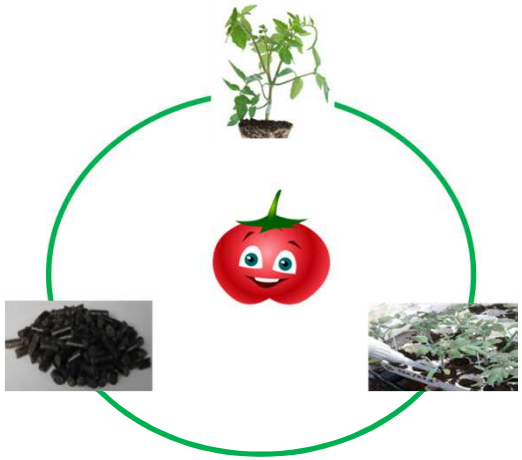
- ✓ One great challenge in the 21st century is to **increase yield reducing the ecological impacts** of the production chain on the environment.

Aims of Project

The present PhD project is focused on innovative strategies able to increase the sustainability of the processing tomato production reducing the use of external inputs.

The project aims to achieve these goals:

- ✓ to exploit the probiotic diversity of soil microbiota to enhance crop performance;
- ✓ to produce new processing tomato seedlings grafted and inoculated with microbial consortia;
- ✓ To assess the effect of innovative fertilizers (based on digestate) on processing tomato microbiota.

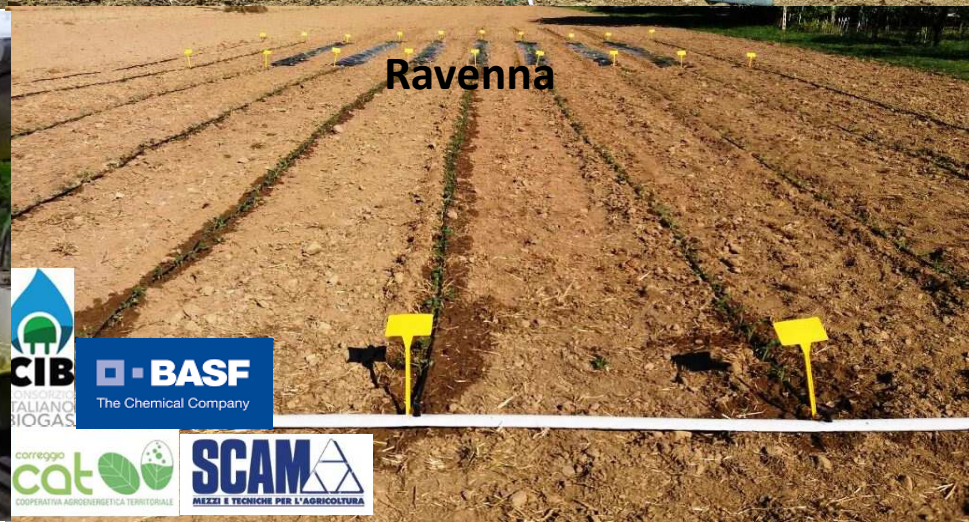


Activity


Fidenza


la COLLINA
Reggio Emilia
tomato colors
Soc. Coop.


Climatic chamber


Ravenna
CIB
BASF
The Chemical Company
cat
SCAM
MEZZI E TECNICHE PER L'AGRICOLTURA

Rootstock experiments

VS

Wild rootstock would seem to have **performed better** in comparison with the cherry one

Climatic chamber experiments

Seedlings at the end of chilling stress. A) Genotype Everton; B) Genotype H3402; C) Genotype Pearson. In each square, from left to right: CTRL, AFM, PGPR and AFM + PGPR

Arbuscular mycorrhizal fungus (AFM), plant growth promoting rhizobacterium (PGPR) and their consortium **effected chilling tolerance** in processing tomato seedlings

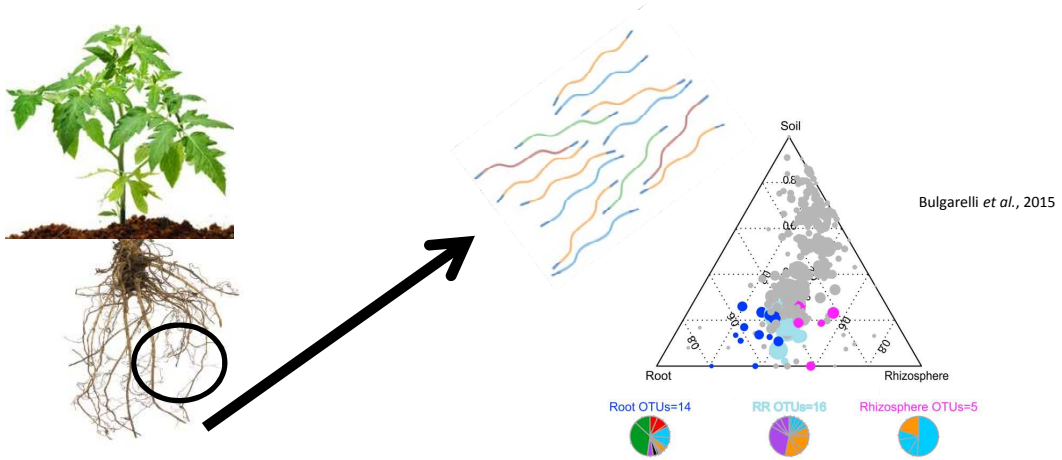
Caradonia et al. (submitted to Scientia Horticolturae)

Processing tomato microbiota

University of Dundee/James Hutton Institute collaboration

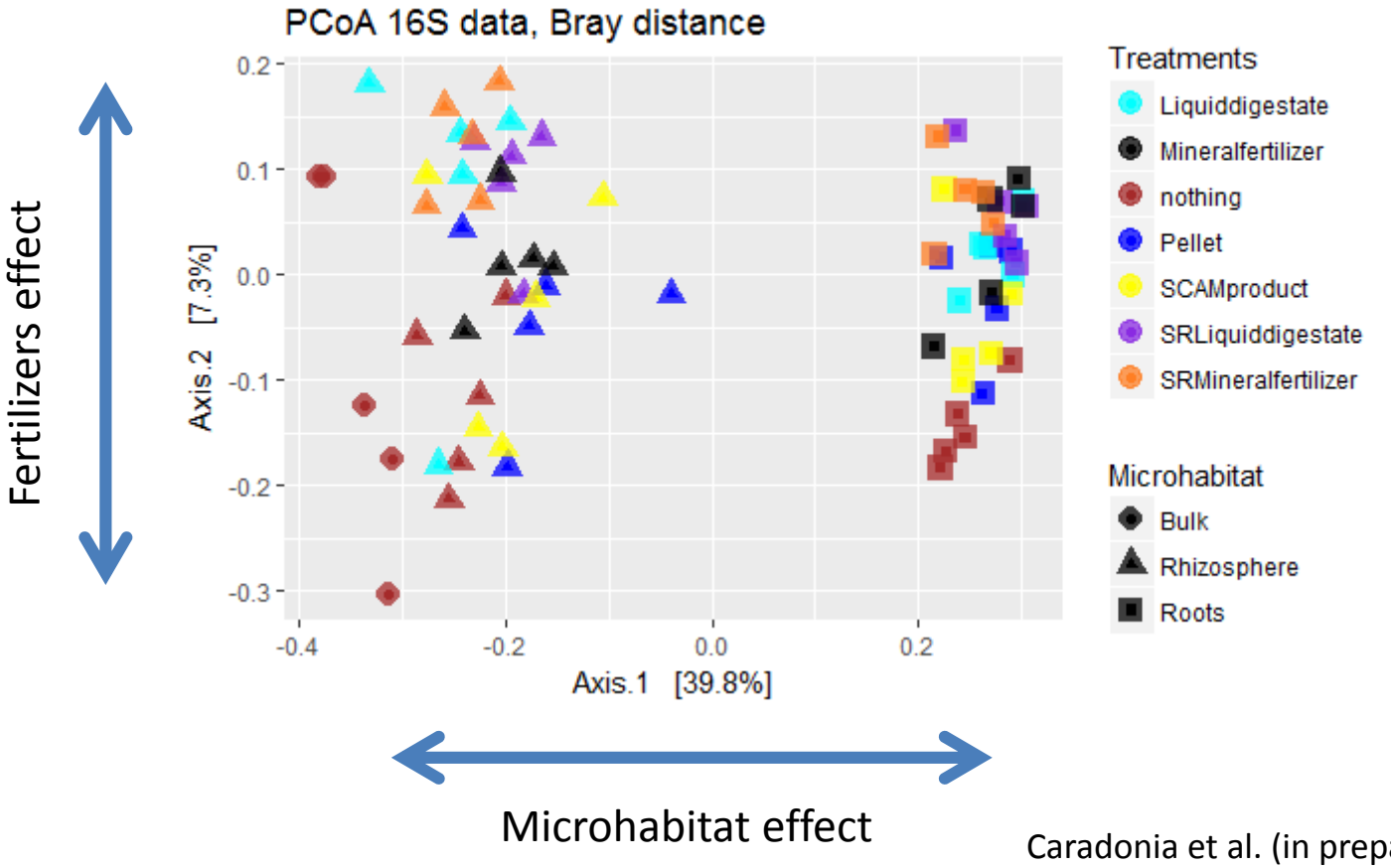
Bacterial composition of roots and rhizosphere of processing tomato plant

Effect of different forms of nitrogen on processing tomato microbiota



METAGENOMIC ANALYSIS

Processing tomato microbiota



Caradonia et al. (in preparation)

Conclusions and Prospectives

- ✓ **Beneficial microorganisms** present in the rhizosphere **could be used** to **increase crop tolerance** to abiotic stresses.

- ✓ Processing tomato microbiota is strongly influenced by **microhabitat (roots and rhizosphere)** and it is **quite resilient to external inputs.**

- ✓ **Further studies are necessary** :
  - ➢ to assess the activity of the microorganisms and their consortium on processing tomato performance on chilling stress, also in the open field, where environmental factors could influence microorganism activity;
  - ➢ to understand how to exploit the new information on structure and behavior of processing tomato microbiota.

Thank you for your attention….