



BOOSTING FUNCTIONAL BIODIVERSITY TO MAXIMIZE ECOSYSTEM SERVICES FOR MEDITERRANEAN CROP PRODUCTION

NUE hybrids from promising pure lines of tomato and eggplant tested in greenhouse and field conditions by UNIRC

Starting from January 2025, three different trials in pots and greenhouse were conducted on tomato and eggplant at two different locations in Sicily and Calabria. In detail, a greenhouse experiment was set up and monitored in collaboration with a private company (SATA srl) at Rosolini (RG) location and a field experiment at ARSAC (Agenzia Regionale Sviluppo Agricolo Calabria) experimental field in San Marco Argentano (CS). The analysis of correlation (between hydroponic/growth chamber vs. greenhouse/field conditions) of plant reactions (not only in terms of crop production but also for key genes expression during stress) to N limited condition are actually under evaluation.



Figure 1. Different tomato genotypes grown under two different N supply (High N and Low N) were evaluated in pots under greenhouse at Rosolini (RG) location.



Figure 2. One of the performant tomato genotypes under low N condition, showing a high Nitrogen Use Efficiency



Figure 3. Eggplant genotypes performance evaluation under low and high N in greenhouse experiment at Rosolini (RG) location.

The best performant eggplant genotypes for tolerance to low N condition were also analyzed for salt tolerance at Marsala (TP) location in pots under greenhouse A very large experiment, including the best eggplant genotypes for NUE, were conducted under two different salt levels (30 mM vs. 120mM). The eggplant production performances were analyzed and a Salt Tolerance Index were calculated based on this formula

$$STI = (DM_s/DM_c)/(ADM_s/ADM_c)$$

where DM_s and DM_c are the dry weights of each genotype, and ADM_s and ADM_c are the average values of dry weights of shoot, leaves and fruits of all genotypes under salt and control conditions, respectively.



Figure 4. The effect of salt on eggplant young leaves.



Figure 5. A comparison of eggplant genotype treated with 30 and 120 mM of NaCl.

3rd ECOBOOST Meeting has been held at the University of Gottingen in Germany

The third ECOBOOST meeting, hosted by Prof. Michael Rostas and his team, took place from 1.-4. June 2025. During the event the consortium presented the latest research findings and discussed collaboration strategies across the working groups.



Figure 6. 3rd ECOBOOST Meeting at the University of Gottingen

During the meeting the Consortium decided to organize the last meeting of the project in Rabat (Morocco) hosted by prof. Laila Sbabou and her team in February 2026



Figure 7. next ECOBOOST Meeting will be held in Rabat

summer school on “chemical ecology” organized by BPI

A summer school organized and hosted by BPI. on July 7–10. Ten MSc and PhD students from five different universities were trained in key aspects of insect chemical ecology through lectures and hands-on sessions: 1) Collection of volatile organic compounds; 2) Electroantennography (EAG); 3) Insect behavioral bioassays. The program concluded with a visit to the project’s tomato pilot field for live demonstrations of agroecological practices.



Figure 8. summer school on “chemical ecology” organized by BPI

Living Lab and demonstration activity carried out by IUAS

Within the scope of the Living Lab activities, harmful insects found in greenhouses and their natural enemies were reared under laboratory conditions, in order to demonstrate the process to stakeholders and provide them with information on these topics. For this purpose, harmful insects such as the pea aphid (*Aphis fabae*), peach aphid (*Myzus persicae*), and cotton mealybug (*Phenacoccus solenopsis*) were reared. Beneficial insects such as *Hippodamia convergens* and *Adalia bipunctata*, which feed on aphids, and *Cryptolaemus montrouzieri*, the most important predator of mealybugs, were also reared.



In addition, tomato, pepper, and eggplant production plots were established in the Plant Protection Department's trial area. In each trial plot, strips of dill (*Anethum graveolens*) were grown as companion plants to attract beneficial insects. In addition, yellow, blue, and yellow sticky traps were placed in these trial areas for each plant species. Greenhouse producers who came to the Plant Protection Department for training were first given theoretical presentations on Biological Control. Then, information was provided by showing harmful and beneficial insects produced in the laboratory. Finally, the developments in the trial plots were conveyed to the growers, the beneficial insects that came to the companion plants were shown, and information was provided about the insects caught in the sticky traps.



Finally, brochures prepared for the growers were distributed.



Demonstration activities organized by DUTH

On July 24th, DUTH organized a Demonstration Day to present key activities of the ECOBOOST project. The event started with an overview of the project's aims and research directions, followed by short presentations on innovative approaches for improving crop protection. After the introductory session, participants visited the greenhouse facilities, where they observed the pilot experiments in action. Practical training on seed coating and the use of plant volatiles was also provided, giving attendees the chance to gain hands-on experience. The day concluded with an open discussion, encouraging the exchange of ideas and feedback.



UFMC1 Advances on Tomato Salinity Tolerance

Over the past months, UFMC1 researchers have been investigating the physiological and biochemical responses of tomato plants exposed to salinity. Germination and seedling growth trials across five genotypes revealed striking variability in tolerance, especially in biochemical traits. The team is now moving forward with ion content analysis (Na^+ , K^+ , Ca^{2+}) and enzymatic assays, which will provide deeper insights into the mechanisms of resilience.



UFMC1 Field Investigations into Morphological and Biochemical Traits

Complementing this work, a field study launched in late May is evaluating multiple tomato genotypes under natural open-field conditions. By combining morphological and biochemical assessments, the study is uncovering notable differences in growth and stress responses. Such results not only shed light on the adaptive potential of tomato but also lay the foundation for selecting promising lines for future breeding and improvement programs.



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