

G2P-SOL Consortium

- Agenzia Nazionale per le Nuove Tecnologie, L'Energia e lo Sviluppo Economico Sostenibile (ENEA), Italy
- Wageningen University & Research, The Netherlands
- The James Hutton Institute, United Kingdom
- Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Germany
- Universitat Politècnica de Valencia, Spain
- Università degli Studi di Torino, Italy
- Institut National de la Recherche Agronomique (INRA), France
- Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria (CREA), Italy
- The Agricultural Research Organisation of Israel - The Volcani Centre, Israel
- Eurice - European Research and Project Office GmbH, Germany
- Instytut Hodowli i Aklimatyzacji Roslin Panstwowy Instytut Badawczy, Poland
- Centro Internacional de la Papa (CIP), Peru
- Phenome Networks LTD, Israel
- Ministry of Food Agriculture and Livestock, Turkey
- Maritsa Vegetable Crops Research Institute, Bulgaria
- The World Vegetable Center (AVRDC), Taiwan
- Blumen Group S.p.A., Italy
- Consorzio Sativa Società Cooperativa Agricola, Italy



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For more information, please visit our website:
www.g2p-sol.eu



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G2P-SOL

From Genotype to Phenotype:
Linking genetic resources, genomes and
phenotypes of Solanaceous crops

www.G2P-SOL.eu

About G2P-SOL

Solanaceous plants are of strategic importance for humankind all over the world. They include important food plants, such as potato, tomato, pepper or eggplant and other widely used plants like tobacco, petunia and belladonna.

During the domestication process, these plants went through a genetic bottleneck resulting in a reduction of the gene pool as well as an increased sensitivity to biotic and abiotic stress and rapid environmental changes.

G2P-SOL focuses on the four major Solanaceae food crops: Potato, tomato, pepper and eggplant - with the aim of restoring the complexity and richness of the original germplasm of these four crops. G2P-SOL will retrieve the genes that make these plants resistant to biotic and abiotic stress and provide good quality fruits and tubers.

To this end, the G2P-SOL project will harmonise the existing germplasm resources and perform sequence-based genotyping and phenotyping for traits of strategic importance for each crop.

These activities will lead to a significantly enhanced understanding of the variability held in the highly valuable collections, thus greatly increasing their utility in Solanaceous crop improvement. This will have downstream impacts on food security in the face of environmental challenges in the future.

The creation of global genotyping information and its linking with phenotypes, both within and across species, will enormously accelerate the discovery of the genetic basis of novel traits and their use in crop improvement.

By making this information accessible to end-users (geneticists, breeders and farmers), the use of novel genetic diversity in crop breeding programmes will be stimulated resulting in a diversification of agricultural and food production chains.

The information collected during the project will be housed in an open source software platform, allowing easy interfacing with existing platforms for germplasm cataloguing.



Prof. Giovanni Giuliano, ENEA
G2P-SOL Coordinator

“Genetic diversity is most efficiently preserved when the germplasm is well characterised, widely available and employed in agricultural practice. Thus, scientists, breeders and farmers need to become familiar with the tools used to preserve, catalogue and assess the germplasm, using publicly accessible information on its diversity and associating it with phenotypes and agronomic traits”.

Genotype is the complete heritable genetic identity of an individual.

Phenotype is the set of characteristics observable in an individual, such as morphology or development.

G2P-SOL Objectives

G2P-SOL will provide access to more comprehensive, uniform, and pertinent information on Solanaceous food crops and facilitate its transfer into crop improvement.

The objectives of this ambitious project are:

- Inventory and conservation of genetic resources: To better characterise germplasm available into European and international genebanks.
- Description and assessment: To immortalise and link together genotypes and phenotypes.
- Pre-breeding: To identify novel sources of variation and accelerate crop improvement.
- Dissemination, valorisation and training: To increase awareness on the value of genetic resources and to enhance informed transfer into breeding programmes.

Pre-breeding

Identification of valuable traits from cultivated and wild germoplasm.

Translation of these traits into breeding, variety development and farming practice.



G2P-SOL focuses on the four Solanaceous food crops: Potato, tomato, pepper, eggplant

- Staple food for millions of people
- 606 million tons world production per year
- 186 billion € economic value

G2P-SOL Gateway

The G2P-SOL partners will commonly establish a user-friendly database for the management of germplasm collections, storage and analysis of experimental data and identification of phenotype-to-genotype relations. These features will be available to end-users through the G2P-SOL gateway.

- Making information publicly available in a unified systemised and user-friendly way.
- Providing access to the worldwide Solanaceous germplasm.
- Sharing data on population structure, genomic composition, phenotypes, methods for data analysis