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Università di Catania



Breeding for Resilient, Efficient and Sustainable Organic Vegetable production

KER 1: Genetic and phenotypic characterization of plant genetic resources (PGR) for broccoli, snap bean and tomato including crop wild relatives and segregating populations.

KER Presentation

- 🌱 Peter Walley, University of Liverpool
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KER characterisation

Problem

- Most commercially available ‘improved germplasm’ used for cultivation of vegetables corresponds to varieties developed for conventional high input agriculture.
- Typically, genetic variation in current breeding programmes will not be sufficient to react to new and emerging pests and disease and increasing frequency of abiotic stress.
- Genebanks do not have the capacity to perform targeted assessment of large collections

Solution

- Assemble and characterize larger structured core collections.
- Targeted phenotyping and genotyping
- Early identification of beneficial material for immediate use and development
- Make information and material accessible to breeders/ growers/ farmers

KER characterisation

What we did

- Assembled large structured collections for brassicas, bean, and tomato
- Core collections can be maintained and added to
- Rich source of genetic variation
- Rich source of phenotypic variation
- Selections of CWRs and landraces with resilience
- New crosses to generate breeding lines for one or more traits of interest
- Improved lines, hybrids and heterogeneous populations

BRESOV innovation

- Genetic and phenotypic data for crop wild relatives and landraces
- Unique sources of variation identified early
- Crosses established to define the genetic basis of unique resilience/ tolerance.
- Catalogue of traits defining variation for organoleptic quality
- Defined phytochemical variation for added value

KER characterisation

Who will benefit from our results?

- Organic farmers and associations
- Seed companies (breeding programmes)
- Researchers and other organic breeding projects
- Improving crop heterogeneity
- Conservation schemes
- Genebanks
- Conventional agriculture
- The consumer!

What do we plan for the future?

- Germplasm in the core collection represents a unique screening resource that can be used for multiple traits in the future, requiring suitable recognition of the resource.
- Exploitation routes applicable to the source material, e.g.,
 - Registration of new cultivars for direct exploitation by partners or for licensing to seed companies and breeders
 - Publications describing new sources of variation, breeding materials and/or new cultivars
 - Evaluation of materials by potential users (farmers, seed companies)
 - Identification of the genetic control of organic farming-related traits

Impact of the KER in 3-years time

- Base collections with accompanying genotype and phenotype data assembled in a usable database enabling selection of optimal combinations.
- Opportunity to screen for other traits.
- Information sent back to Genebanks.
- National and international grants from programmes aimed at exploitation of research results, particularly those involving a combination of public and private sectors



Thank you for your attention!

Whom to
contact in case
of interest?

- Dr Peter Glen Walley
- University of Liverpool
- Peter.walley@Liverpool.ac.uk



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