

Resilience of berry breeding germplasm in Europe: One important task in the European BreedingValue project



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Introduction, context and objectives

Plant breeding is the key for providing high performance cultivars in a permanent adaptation process to cultivation systems, climate change, consumers' needs and industrial expectations. **BreedingValue** in the frame of Horizon2020 will build on a very wide European germplasm gene pool by using large living plant collections of strawberry, blueberry, and raspberry (cultivars, wild species, breeding material).

A wide range of all modern tools in molecular, metabolomic and phenotypic methods will be applied. The responsibility of work package 1 lays in the GenRes management, definition and selection of proper plant material, as well as establishing field trials and phenotyping.

Material & Methods

Steps of the material identification were

1. Preliminary information collection from partners (rough estimates of accessions available),
2. Creation of plant categories (passport information, importance for pedigrees and market importance at its time, year of release, main characteristics (which are relevant for use in other WPs for specific experiments))
3. Collection of material information collection from partners (in categories with year of first mention and main characteristics)
4. Material selected for specific tasks (molecular, metabolomic and phenotypic methods)

Field trials and maintenance

1. ECPGR concept is used and made available, living plant collections of partners included
2. On-farm/ Ex situ / In vitro conservation
3. Establishment of plantations in all kinds of cultivation systems

Conclusions and perspectives

The Horizon2020 project **BreedingValue** (title: "Pre-breeding strategies for obtaining new resilient and added value berries") needs proper plant material to apply modern tools in molecular, metabolomic and phenotypic methods to strawberry, blueberry and raspberry. The material was selected by all partners, assigned to different plant categories and will serve as the base tasks and subtasks of the work packages in the project. Plantations in different cultivation systems serve as the base to deliver material and data for genetical, volatile and nonvolatile analysis and all kinds of phenotypical evaluations. An allelic diversity study in strawberry is performed with specifically selected material to shed light on the breeding history and to evaluate the resilience of the European breeding material for the future.

Results: Definition of plant material and maintenance

Plant category 1 Old cv. (until 1960)	Plant category 2 Modern cv. (1960-2005)	Plant category 3 Newest (released) cv. (2005 till now)	Plant category 4 Pre-breeding (advanced selections or selections in new breeding directions)	Plant category 5 Species	Plant category 6 Populations

Fig. 1 Definition of the main plant categories on example of strawberry

Based on year of introduction, market importance, breeding background, and availability six plant categories are defined for strawberry, raspberry, and blueberry. A seventh category was created to collect genotypes of selfing pedigrees. In summary, 1510 genotypes for strawberry, 86 for raspberry, and 81 for blueberry are potentially available for the project. Additionally, existing data from over projects will be included in the data management. Selected material of these categories were propagated, planted in different cultivation systems and currently used in experiments.