

How to create diversified variety mixtures based on gene bank resources

Problems

More than one million accessions are kept in European gene banks. However most of these cultivars have a very low intrinsic genetic diversity. In contrast, many farmers are trying to create diversified populations suitable to organic agriculture, that are more adaptable and resilient.

Solutions

A simple but effective strategy to generate a diverse population of a crop is combining different cultivars into a mixture. Around 200 accessions of the chosen species are requested from European or international gene banks, these are multiplied and their agronomic features observed (e.g. lodging, earliness, disease resistances). After 2 to 4 years of multiplication, collectives of farmers can receive mixtures of these cultivars. The farmers can choose the characteristics of the mixtures they receive, based on the traits and qualities observed during the multiplication process.

Practical

- Mixing numerous varieties coming from gene banks compensates their low intra-varietal diversity
- Creating populations based on phenotypical and agronomical traits accelerates the selection process for farmers
- This method requires a multiplication and observation phase of the individual accessions on single plots for a period of 2 to 4 years. It can be done by farmers' associations and/or researchers both on-farm and in research stations.

Further information

1. Mobilisation of forgotten biodiversity via on-farm selection, on the example of rivet wheat (in French): <http://itab.asso.fr/publications/aa-biodiv-oubliee-poulard.php>
2. PA#57 Comparison of two breeding strategies for soft wheat populations
3. LIVESEED Booklet#1: "How to implement the organic regulation to increase production & use of organic seed" Part Three - Alternative sources of organic seed <https://www.liveseed.eu/tools-for-practitioners/booklets/>

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LIVESEED: Boosting organic seed and plant breeding across Europe. LIVESEED is based on the concept that cultivars adapted to organic systems are key for realising the full potential of organic agriculture in Europe. Research project 2017-2021.

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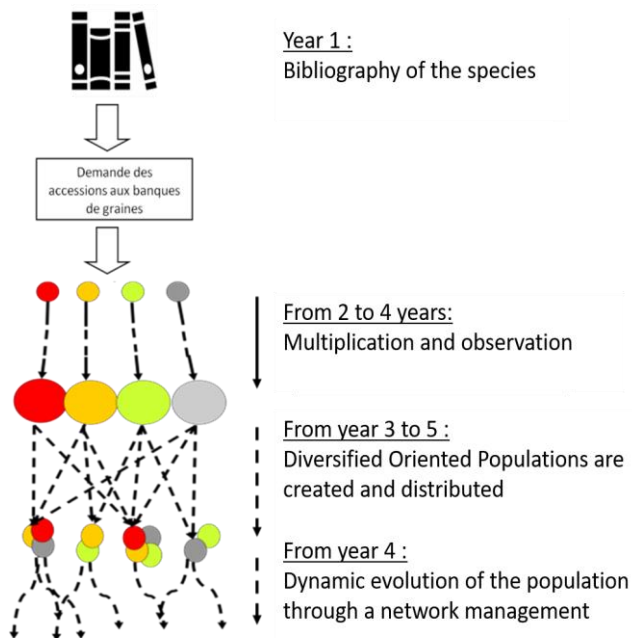


Figure: Different steps of the method

