

How to produce seed of heterogeneous populations of inbred cereals

Problems

Organic cereal seed production of heterogeneous populations may appear simpler than uniform varieties, however to produce quality seed of locally adapted cereal population, skills and attention are needed.

Solutions

- Maintain the original source:** It's good practice to grow a plot of the original population large enough to ensure seed for a field. 1.000 m² should provide enough seed for 1 ha the following year. Within this nucleus carry out quality controls: remove plants of foreign species and carefully check for diseases. Take every precaution at harvest to avoid contamination with external seed (combine, thresher, etc.).
- Foster local adaptation:** Start off with the highest possible level of intra-population diversity, avoid excessive selective pressure during first crop cycles, keep a backup of last year's seed in case of severe reduction in yield. As seed is bulking up, move towards your target micro-environment and allow the crop to naturally evolve.
- Select new cultivars:** Select the best plants in the field but harvest only the top half of the ear to avoid removing genetics from the original source. Promising pure lines can be kept separate or mixed together to create multi-line mixtures.



Figure: ICARDA/SOLIBAM Floriddia bread wheat population, Peccioli, Italy 2017
(Photo: RSR)

Practical recommendations

- Keep a seed sample for each year
- Avoid practices that are too selective (i.e. removing small seeds at cleaning stage)
- Record crop performance and climate data in a field book

Further information

Murphy, et al. (2005). Breeding for organic and low-input farming systems: An evolutionary-participatory breeding method for inbred cereal grains. *Renewable Agriculture and Food Systems*, 20(1), 48-55. DOI: [10.1079/RAF200486](https://doi.org/10.1079/RAF200486)

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Date: May 2020

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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