

# Tools to identify genetically heterogeneous cultivars 1: constitution

## Problems

In a variety, one individual plant can represent the whole plant grouping, making univocal identification possible, whereas in organic heterogeneous material (OHM) an individual plant cannot represent the population, and therefore a range of description and identification metrics is needed. Hence, seed registration and certification of OHM relies on information on the constitution, traceability and description of the OHM seed.

## Solutions

A temporary experiment on the marketing of genetically diverse populations of wheat, barley, oats and maize was granted under the EU implementing decision 2014/150/EU, where tools to identify and describe genetically diverse populations were tested. Tools to document the **constitution** of population were set out as (i) the breeding goal, (ii) the breeding method and (iii) the parent varieties. A SWOT analysis of these tools was performed to inform future developments of the legality of OHM (Table 1).

**Table 1: SWOT analysis conducted on tools documenting the constitution of populations in 2014/150/EU: 'Breeding goal' ; 'Breeding method' ; 'Parent Varieties'**

STRENGTHS – Information on constitution can:	WEAKNESSES – Information on constitution can:
<ul style="list-style-type: none"> <li>● give an overview of the intended purpose of the population as <b>breeding goal</b></li> <li>● provide full and transparent information on the origin and genetic history of a population as <b>breeding method</b> and <b>parent varieties</b></li> <li>● prevent breeders from registering varieties with off-types or variety mixtures as populations</li> </ul>	<ul style="list-style-type: none"> <li>● as a <b>breeding goal</b>, be hard to translate into reality</li> <li>● provide a <b>breeding goal</b> insufficiently detailed on end-use, or be too generic, without a quantifiable/qualifiable target</li> <li>● insufficiently document <b>parent varieties</b>, especially for progenies of heterogeneous parents e.g. landraces</li> </ul>
OPPORTUNITIES – Information on constitution might:	THREATS – Information on constitution might:
<ul style="list-style-type: none"> <li>● be verified in respective performance trials and also provide information on intended use, if the <b>breeding goal</b> is precisely defined</li> <li>● inform end-users, that want to ensure the seed they use complies with their standards in terms of <b>breeding methods</b> and <b>parent varieties</b></li> <li>● provide information about a population's change over time, if description of '<b>breeding methods</b>' includes a description of selection environments and multiplication methods/conditions</li> </ul>	<ul style="list-style-type: none"> <li>● be misleading to end-users, if they assume that <b>breeding goal</b> is identical to the performance characteristics of the population</li> <li>● be too limiting if only registered varieties are allowed as a population's <b>parent varieties</b></li> <li>● encounter breeders' unwillingness to declare <b>breeding methods</b></li> </ul>

## Practical recommendations

- For breeders: it is good practice to clearly outline the intended use of a population as a breeding goal.
- A measurable/verifiable breeding goal it can help in identification and performance testing.
- For OHM, which sits under the Organic Regulation, information on parent varieties and breeding methods are key tools to prove compliance with organic standards

## Further information

1. [Text of the Commission Implementing Decision 2014/150/EU](#)
2. [Main outcomes and SWOT of experiences from marketing populations under the Temporary Experiment into the commercialisation of heterogeneous populations in the European Union](#)

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