

Breeding for organic agriculture: the example of winter wheat in Austria

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Abstract Breeding for organic agriculture (BFOA) is a strategy for a commercial breeding company based on the exploitation of the frequently observed high correlation for many traits between conventional, low input (LI) and organic agriculture (ORG). Indirect selection under LI can be useful to roughly divide the germplasm into the genotypes better adapted to high input and those better adapted to LI or ORG conditions. BFOA is an evolving process, in which two methods are currently applied: early generations are either selected following the pedigree system under LI, or grown as bulk populations on ORG fields. In the latter case the system switches to LI after individual ear selection under ORG

conditions. In both methods, the first replicated yield trial is grown parallel under ORG and LI. Subsequently, the genotypes are grouped into conventional or ORG advanced trial series. The BFOA strategy allows that the larger genetic variability of both the organic and conventional gene pool can be exploited in the selection for ORG. Hitherto, seven winter wheat varieties were released in Austria after exclusive organic VCU testing.

Keywords Breeding strategy · DUS · Indirect selection · Low input · *Triticum aestivum* · VCU

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Abbreviations

BFOA Breeding for organic agriculture
DUS Distinctness, uniformity and stability
HI (Conventional) high input agriculture
LI (Conventional) low input agriculture
N Nitrogen
ORG Organic agriculture
VCU Value for cultivation and use

Introduction

In the last decade growing environmental concern and decreasing prices stimulated an increasing number of European farmers to favour agricultural systems with lower input levels. Especially organic farming has