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DESIGNING VARIETAL EVALUATION SYSTEMS FOR ORGANIC FARMING: A MULTI-ACTOR APPROACH

Laurence FONTAINE¹, Arnaud GAUFFRETEAU², Nathalie MOUTIER³,
Marie-Hélène BERNICOT¹

¹ GEVES,

² INRAE UMR 0211 Agronomie,

³ INRAE UMR 1349 IGEPP, France

laurence.fontaine@geves.fr; marie-helene.bernicot@geves.fr

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In a context of a significant development of organic farming (OF), the demand for varieties adapted to OF is increasing. To develop the supply, it is necessary to acquire varietal assessment tools adapted to OF, whether for breeding, for registration in the Catalogue or simply to provide reliable references to users. This condensed article gives an overview from the perspective of stakeholder collaboration on varietal evaluation systems for OF. It is mainly based on current reflection within GEVES and on analysis of results from the research programme ECoVAB (Fontaine *et al*, in press), which investigated for arable crops how to describe and evaluate a variety adapted to OF.

Several topics have been explored in ECoVAB. 1/ The expectations in terms of varieties of farmers and collectors in the organic sector were surveyed and compared with the current variety supply. 2/ Varietal results for soybean and wheat, acquired in OF and conventional farming (CF), were compared to assess their redundancy, complementarity, or specificity. 3/ Varietal response to limiting factors commonly encountered in OF was analysed: water stress for soybean; nitrogen stress for wheat. 4/ The suitability of varieties to intercropping has been studied in the case of wheat-legumes mixtures, by questioning whether the behavior of a variety grown in sole crop is predictive of its behavior in mixture. Finally, proposals have been made to design evaluation systems for varieties intended for organic farming.

The results confirm that 1/ the assessment of specific traits is expected in OF. In particular, the ability to compete with weeds, based on various criteria. Describing the canopy architecture and its dynamic development is also of interest for predicting behaviour in intercropping or in variety mixture. 2/ More generally, if the need for assessment in OF conditions is emphasised by organic users, this can be modulated: not all varietal traits need to be evaluated in this cropping management system. Indeed, there is a complementarity between varietal evaluation in OF and CF, which depends on the crop species, the criteria considered, the genotypes tested and the test conditions (level of input use, pedoclimate...), questioning the relevance of mixed systems. 3/ In view of the diversity of growing conditions (probably more prevalent

in OF because there is no possibility of adjusting through the use of chemical inputs), there is an interest in exploring variety ranges for diverse environments, rather than looking for a single ideotype. 4/ For some traits for pea (height at the end of cycle, yield), the values in sole crop did not seem to be predictive of those observed in mixture. Consequently, a specific evaluation of these traits in intercropping appears necessary (cf Moutier *et al.*, “Breeding for diversity” topic).

In view of these results and in relation to the involvement of actors, it appears that previous consultation is necessary between stakeholders (from farmers to consumers), advisors, researchers and breeders, to define which varieties are sought for OF. Consultation should participate to design the varietal evaluation systems by focusing on the expected qualities, and their translation into traits; on the growing conditions and their potential variability; on the possibility of extrapolating available data from CF or setting up tests in CF.

Although some results can be provided by data obtained in CF, collectors and farmers in surveys cite the importance of setting up varietal assessment platforms in OF, whatever the crop species. Those platforms are in fact privileged discussion forums where everyone can visually appreciate the varieties and share their experience. However, this raises questions about the type of such varietal platforms, given that they can be imagined at different levels, modulating (i) the implication of researchers and farmers (notably for notation), (ii) the trial location on a station or on-farm, (iii) the trial design (large band or small-plots with replication, protocols). Studies bringing together statisticians, practitioners and variety specialists would be useful to design new participatory evaluation systems combining these different types of trials and integrating farmers' references and knowledge in the assessment of varieties. In addition to the description of varieties, targeted communication on OF was clearly expected.

From breeding and variety registration phases to post-registration assessment, this requires a good coordination between research and development stakeholders, i.e. the implementation of dedicated consultation groups, institutional or not, questioning the level of participation, either consultative or collaborative (Probst *et al.*, 2003). This is consistent with the results of surveys showing that farmers are key actors with whom to collaborate, in addition to stakeholders in commodity chain, to establish knowledge needs on varieties and to guide breeders and assessors. It is necessary to continue to identify these needs at regular intervals of time, by comparing them with the available variety supply and the needs of the commodity chains, whether short or long.

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