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ARE THE TRAITS OF WHEAT AND PEA CULTIVARS IN SOLE CROP PREDICTIVE OF THEIR BEHAVIOR IN MIXTURES? CONSEQUENCES FOR ADVISORS AND BREEDERS

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Abstract: In France, areas cultivated with cereals-legumes mixtures have been steadily increasing for 10 years, mainly in organic farming systems. For this management, little advice is available for varietal choice and there is almost no specific varietal selection. Farmers based their varietal choice on the traits of cultivars grown in sole crop, cultivars that have been selected for the dominant sole crop system. In these conditions, we can wonder if the traits observed in monoculture are predictive of those observed in mixture.

Our study focused on eleven varietal traits and performances of wheat and pea, in sole crop and in mixture.

Our results show that only half of the traits measured in sole crop are predictive of the traits in mixture and that the other traits such as yield cannot be predicted correctly by the values in sole crop.

Varietal advice for mixtures cannot therefore be based only on the known cultivars traits grown in sole crop. Specific assessments must then be carried out in mixture in order to 1) specify the varietal key traits necessary for the success of a mixture, according to the objectives targeted by the farmer, and 2) to develop, in the future, selection programs specific to mixtures.

Keywords: breeding, cereals, genotype x management interaction, interspecific mixtures, Legumes, varietal choice