

EVALUATION OF WEST-EUROPEAN ONION LANDRACES WITH HIGHEST POTENTIAL FOR ORGANIC FARMING

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Commercial onion breeders focus almost exclusively on conventional farming. This raises the demand for certain well known varieties, but lowers the general diversity available on the mainstream market. Therefore, organic farmers become increasingly dependent upon hybrid onion varieties. A way to preserve natural order and retain the equilibrium of biodiversity is to breed more open-pollinated plants. Through their distinct aroma and flavor, these plants are again drawing the interest of farmers and consumers alike, making them a viable alternative to commercial hybrids.

The objective of this study was to characterize the yield stability, morphological and quality parameters, including the concentration of health-promoting compounds, in nine open-pollinated landraces grown under organic conditions. In order to identify the most promising onion varieties they were compared with two commercial, well-established control accessions.

The research was conducted over three years, from 2014 to 2016, at the experimental station for organic farming of the University of Hohenheim (Stuttgart, Germany). Fresh edible parts of onion bulbs were harvested and used to determine the content of pyruvic acid, carbohydrates, total soluble solids and dry matter, as well as their antioxidant capacity.

Principal component analysis (PCA) showed that most of the onion varieties follow a very close distribution pattern. Only two of the landraces stood out significantly ($p < 0.05$). Compared to the average values of the other onion landraces, the variety “Birnförmige” performed best because it demonstrated high content of dry matter, as well as fructan and pyruvic acid, both known to have curative and medicinal properties. In strong contrast, the variety “Jaune des Cévennes” demonstrated poor quality and in agricultural terms a higher than average bolting percentage.

Qualitative and quantitative differences that were found among the studied eleven varieties enabled us to identify “Birnförmige” as the most promising onion landrace for organic production in terms of quality and health-promoting compounds.