Development of a standardized methodology for phenotypical characterizations in apple

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The description of phenotypic traits in apple cultivars is generally performed using internationally agreed descriptors such as UPOV guidelines, which defines for each trait several states of expression. However, it is not always possible to classify a cultivar unambiguously using those guidelines, because in practice the states are not clearly enough defined or the example varieties used to clarify the different states are not available in the collection. This work presents the results of a harmonization project performed by the teams responsible of the main apple germplasm collections in Spain. The objective was to develop a standardized method for the 57 traits included in the TG/14/9 UPOV guidelines for apple characterization, defining their states of expression in a clear and unambiguous way for Spanish germplasm. Phenotypic data collected for more than 1,600 accessions from Spanish collections was used and the method to define each state depended on the type of expression. For quantitative traits the number of states and their limits were defined according to the variability that exists within and between accessions. For qualitative traits, high-resolution images clearly depicting each state were selected. A standardized characterization protocol for the 57 traits of apple germplasm has been provided, enabling to comparing properly the phenotypes of Spanish genetic resources.

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