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To taste or not to taste: that is the question! Innovative approaches and instruments for tomato breeding

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Tomato (*Solanum lycopersicum L.*) is an important crop worldwide and the most important vegetable in Europe. During the last decade of selection breeders successfully focused on traits as plant yield, long-shelf-life and disease resistances, nonetheless final consumers are frequently not satisfied regarding the fruit quality and taste. Furthermore, from the breeders' point of view, the lack of phenotyping platforms and clear key traits that can efficiently identify individuals exhibiting rare, optimal genotypes from large populations is currently one of the major bottlenecks. To face this constraint, we promoted two different projects: I) Appreciation of simplification project with the aim to accelerate the development of new improved varieties thanks to the use of Field Book App and II) Taste it ISI with the objective to create a tool for the detection of the flavor components

in tomato directly into the field/greenhouse. In this study, 25 ISI Sementi commercial varieties including 5 testers were phenotypically characterized with all the DUS test traits in order to assess the genetic stability of the hybrids. Then, organoleptic properties of each variety were settled by a sensory analysis and MS: from mature fruits, 19 flavor traits (including L-glutamic acids that are demonstrated to be the main responsible of the peculiar umami taste in tomato) were determined and used to build specific calibrations with a micro-NIR spectrometer. These calibrations and the complete phenotypic characterization done are now successful instruments that are helping the breeders for making the right decision regarding the advancement of tasty tomato breeding lines or varieties.

Biography

Alice Brunazzi has completed her PhD in Agro biosciences, genomics and crop sciences from Sant'Anna University (Pisa, Italy) after several years working as a researcher and Junior Breeder around Europe. She currently is the fresh market tomato breeder of ISI Sementi in Italy, a premier Italian seed company. She has published several papers regarding phenotypic characterization both in cereals and different horticultural species.

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