Genetic Innovations in Tomato Development for Organic Agriculture

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California leads the nation in tomato production, making the adaptation of tomatoes to organic agriculture crucial for achieving higher yields that both support environmental sustainability and meet the demand for processed and fresh market tomatoes. Genetic improvement of tomatoes in low-input organic fields through breeding and selection is key to developing sustainable, high-yielding varieties with exceptional fruit quality that can thrive in the organic sector. Our research aims to create improved parental breeding lines to enhance organic tomato production in California. Organic tomato breeding lines were grown in the certified organic field at Spadra (Cal Poly Pomona, CA), with data collected since 2019 on total yield, marketable yield, fruit quality, and BRIX values. From 2020 to 2023, our data shows a consistent increase in the average total yield of CPP tomato lines, indicating that the genetics of these varieties are stabilizing. Continued performance evaluation, along with improving the broad-sense and narrow-sense heritability of desirable traits, is vital. Ultimately, our goal is to develop superior varieties that will contribute to the sustainability and competitiveness of California's organic tomato industry.