

Development of Fresh Market and Processing Tomatoes at Penn State

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The Penn State Tomato Genetics and Breeding Program has developed improved germplasm for producing fresh-market and processing tomato breeding lines and cultivars, mainly suitable for production in the northeast. Of particular interest has been development of short-season and mid-season tomatoes with high yield, good fruit quality (e.g. high lycopene) and disease resistance (e.g. resistance to early blight and late blight). Genes for desirable traits have been introgressed, mainly from the redfruited wild species *Solanum pimpinellifolium*. In the fresh market tomato background, we have developed new inbred lines of plum (Roma type), cherry and grape tomatoes. Inbred lines of large and medium size round tomatoes are in the pipeline. We have developed a series of experimental hybrids from crosses among our inbred lines as well as with a few inbred lines from the NC State Tomato Breeding Program. These hybrids were evaluated in the field during summer 2007 and a subset will be showcased for industry review in summer 2008. Most of our current fresh market inbred lines and hybrids are high yielding tomatoes with exceptional fruit lycopene content and good foliage and fruit disease resistance. We expect that we will have available inbred lines of processing tomato background within a few years. Many of our recent efforts have focused on incorporating late blight (LB) resistance genes into our germplasm. Progress is being made in incorporating *Ph-2* and *Ph-3* into our fresh market and processing tomatoes. Simultaneously we are incorporating *Ph-5*, a new LB resistance gene discovered at Penn State, into our genetic materials. A goal is to pyramid *Ph-2*, *Ph-3* and *Ph-5* in our breeding lines and hybrids.