Session 5: Grapevine Breeding

Keynote lecture

Grapevine breeding: progress, innovation and opportunity

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Abstract

Thanks to the thoughtful, enthusiastic, informed, assiduous, and dedicated work of grapevine breeders, our grape and wine industry enjoys sustained benefits in improved plant material—new fruiting varieties, clones or selections, and rootstocks. We recognize the important substantial and meaningful improvements that make large, noticeable changes for the better in the way that grapevines are grown and in the products that consumers worldwide value wholeheartedly. For example, the Sunpreme grape variety dries into raisins without cane cutting and the raisins themselves may be harvested by machine directly from the vine, vastly reducing the labor requirement for raisin production. This variety is now in commercial production and shows how new grapevine varieties can radically change the traditional approach to cultivation, since typical practices for raisin production have very high requirements for hand labor, even when partly mechanized. Presently there is exciting and impactful progress being made in the breeding, validation, and commercialization of fruiting varieties that are meaningfully resistant to important diseases, especially downy mildew, powdery mildew, and Pierce's diseases. In some cases, the genetic sources of resistance are newly discovered and in other cases the resistance is derived from well-recognized sources. The important progress now being made is greater in magnitude and scope from the past for several reasons, including international cooperation among researchers, discovery, development, and implementation of molecular markers which help predict resistance phenotypes among the members of segregating populations, vastly improved grape and wine chemical analysis, and important technical advances in small scale research winemaking and grape quality assessment. Recently several seedless table grapes varieties have been commercialized with exceptional flavors and the origin of these flavors is *Vitis labrusca*. Through horticulture, post-harvest physiology and handling, and marketing and advertising, these special grapes can be targeted to appreciative consumers, meeting the diverse expectations and desires of grape consumers thanks to an expanding palette of grape flavors. Discoveries from the germplasm and from genetics populations provides exciting opportunities for future grape breeding. The discovery of genetic resistance against grapevine fanleaf virus, combined with our understanding of phylloxera and nematode resistance in germplasm, enables the breeding of new rootstock varieties with complete resistance against phylloxera and functional resistance against fanleaf degeneration, one of the leading virus disease of grapevine and a serious and persistent threat to viticulture worldwide. Important, useful resistance against other diseases and pests and meaningful improvements in quality and horticultural attributes will continue to distinguish newly-bred grapevine varieties, ensuring both consumer delight and the vitality of our grape and wine industry.