

Vegetable Success Stories through Plant Breeding and Research

Modern Plant Breeding Tools

- ◆ **Disease and pest resistance:** key targets for vegetable breeders and the most effective way to control pests and minimize pesticide use
- ◆ **Increased yield:** almost every type of vegetable grown has seen significant increase in yields. Identifying genes for hybrid vigor to increase that trend in processing tomatoes
- ◆ **Hybrid seed systems:** cytoplasmic male sterility in crops such as peppers and broccoli means increased seed production efficiency and improved seed quality
- ◆ **Market changing traits for producers:** determinate melons requiring less pickings, mechanically harvestable peppers and broccoli with higher heads to facilitate picking help meet producer needs
- ◆ **Improved nutritional values:** high carotene carrots, high lutein spinach and tomatoes, high glucosinolates in broccoli
- ◆ **Attractive to consumers of all ages:** sweet lettuces, mild sweet onions, multi-colored carrot sticks, snack sized seedless cucumbers, nutritious kale without bitterness, sweet grape tomatoes and seedless watermelon
- ◆ **Convenience to consumers:** baby cut and peeled carrots, ready to eat salads, personal sized watermelons, and ready to eat baby leaf spinach

Examples of Research at the Forefront

- ◆ **Staying ahead of Downy Mildew in spinach**
 - New races of Downy Mildew develop on spinach every 2-3 years
 - Breeders must identify new resistances to keep ahead of the changes in the disease-causing bacteria
- ◆ **Overcoming disease in peppers**
 - Global problem for a \$30 billion industry
 - Through gene discovery, identify resistance gene(s) in peppers that can be broadly utilized in a wide range of pepper types
- ◆ **Improved flavor and color in tomatoes for greater consumer appeal**
 - Identification of gene(s) in wild tomatoes that can be used in commercial tomato hybrids
- ◆ **Improved nutrition in broccoli**
 - Identification of gene(s) to increase glucosinolate levels

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