



Weekly News from Berry Science

Breeding Better Berries

Part 2 of 3



Centers for Disease Control and Prevention
National Cancer Institute
National Institutes of Health
(click on image)

Treat yourself to health!
Eating more colorful whole foods *really* matters!



highbush blueberries (*Vaccinium corymbosum* L.), among the most popular fruits in North America

for ***Part 1 on Breeding Black Raspberries***, *click!*

Berry Breeding History

- berries were among the last of all food crops to be domesticated
- although strawberries have been bred for hundreds of years, they received intense effort beginning only in the 1900s and are probably the most widely bred berry other than grape
- since we're only a few generations from wild berry species, berry breeders readily use selections from the wild for breeding programs. This is generally not possible in crops like corn which is far removed from its ancestors

Berry Breeding Strategies

- berries are bred in what professional breeders call "formalized" or "intensive" breeding programs
- the first step in any breeding program is to determine the objectives one hopes to accomplish (*taste, color, hardiness, disease resistance*) and assign priorities
- the parents of each berry selection are chosen so the weaknesses of one are matched by the strengths of the other, with the hope that a few of their offspring will have strengths of both parents and no weaknesses
- professional breeders see a great deal of diversity in berry families and are able to select new plants with the best attributes to breed with the next generation
- a stepwise evaluation program is used to winnow thousands of seedlings down to a few selections with the best characteristics



Muscadine grape (*Vitis rotundifolia*), the 'first' native grape of the United States and the richest source known among berries for [resveratrol](#) -- *click!*

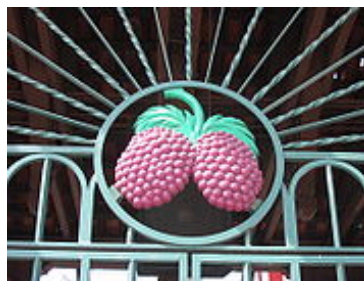
Successful Breeding **Requires Two Decades**

- in year 1, two plants with the desired features - "the cross" - are bred
- in year 2, the seedlings are planted, and they are evaluated in year 4 and the selections made; typically less than 1% of the seedlings are kept as selections
- the selections are propagated and planted in single observation plots in year 5
- the berries are then evaluated in years 7-9 and if appropriate the fruit is harvested to determine yield
- the most promising candidates are propagated, planted into replicated trials in year 10, and data accumulated in years 12-15
- if the decision is made to release a selection as a **cultivar** ("cultivated variety"), it still needs to be "cleaned up" of viruses and propagated in sufficient quantities by commercial nurseries before selling to berry farmers or the public. For optimal fruit production, this may take another 2-4 seasons
- well-screened breeding that yields high-production berries with sustainable characteristics therefore takes about 20 years!



Boysenberries (*Rubus idaeus x ursinus*), a cultivated cross between raspberries and blackberries.

Boysenberries are named after **Rudolph Boysen** (1895-1950), a horticulturalist who first crossed raspberries with blackberries.



Maybe you've seen it? The Boysenberry Gate at Knott's Berry Farm in Anaheim, California

Reference

- with thanks for this information to [Dr. Chad Finn, Berry Geneticist, US Department of Agriculture, Agricultural Research Service, Horticultural Crops Research Unit, Corvallis, Oregon](#)

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