Selecting Barbera Grapevine Clones to Improve Yield and Quality

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Barbera clonal research in California

- What are grapevine clones?
- How can clonal selection benefit growers?
- What Barbera clones are available in California?
- Which clones have been tested, and how do they differ?

Species, cultivars, and clones

- California's wine industry based on a single species of grape, *Vitis vinifera* L.
- Most wines made from traditional (old) varieties of *V. vinifera*, such as Barbera
- Old varieties can accumulate many 'clones' due to mistaken identity, mutation, or both
- Variation among clones may be exploited to improve grapevine yield and quality

What is a grapevine clone?

- A population of vines propagated asexually (e.g., by cuttings) from a single mother vine.
- Virtually all propagated grapevines are technically ‘clones’
- Of particular interest are clones or ‘selections’ having distinctive beneficial characteristics

How can clonal selection research benefit growers?

- Nurseries offer many different clones of a given cultivar
- These may differ with respect to yield, yield components, fruit composition, and susceptibility to pests and diseases
- The performance of a given clone may depend on the climatic region where it is grown

Barbera in California

- Important wine grape in Italy, particularly the Piedmont region
- Good qualities include high yields and high acidity
- Now planted around the world
- 7,500 acres in California; 90% in SJV
- Mostly a blending variety in SJV, increasingly popular varietal wines

Barbera clones

- 7 registered Barbera clones in CA (FPS 2-8)
- FPS 1 was only registered selection from 70s through 90s and is the most widely planted in SJV
- In 1990s, FPS 2 became available, but FPS eliminated 1 due to leafroll, so 2 became the only registered selection

Barbera clones

- Work by LPC showed that FPS 2 had larger berries, was later ripening, and more susceptible to sour rot, than FPS 1
- A clean source of FPS 1 was identified and reintroduced as FPS 6
- Clones 3,4, and 5 (Torino clones) also became available
- FPS 3 and 5 were two cuttings from the same vine

Barbera clones

Clone	Source
2	Rauscedo, Italy
3	Torino, Italy, CVT 171
4	Torino, Italy, CVT 84
5	Torino, Italy, CVT 171
6	Marshall (32 V7), previously Clone 1

Objective

- Evaluate the performance of five Barbera selections in the San Joaquin Valley

Materials and methods

- Barbera grapevine cuttings planted in 2000
- Bilateral cordons, spur pruned, vertical two-wire trellis,7.5’ x 10’ spacing
- Ten single-vine replicates, RCBD
- Harvested annually, 2003-2006
- Within a year, all clones harvested on the same day

Cluster characteristics

Clone	Clusters / vine	Cluster wt. (kg)	Yield / vine
2	73 c	0.31 ab	21.7 b
3	80 a	0.32 a	25.4 a
4	74 bc	0.29 b	21.5 b
5	79 ab	0.31 a	24.4 a
6	74 bc	0.26 c	18.6 c

Berry characteristics

Clone	Berries / cluster	Berry wt (g)
2	105 c	3.06 a
3	127 a	2.59 b
4	115 b	2.57 b
5	122 ab	2.61 b
6	108 c	2.47 c

Fruit composition

Clone	Brix	pH	TA (g/L)
2	23.4 b	3.43 c	0.845 a
3	23.5 b	3.44 bc	0.828 a
4	23.9 ab	3.48 b	0.778 b
5	23.5 b	3.43 c	0.817 a
6	24.3 a	3.55 a	0.744 c

Sour rot incidence

Clone	Sour rot incidence (%)
2	40 a
3	29 b
4	25 b
5	26 b
6	19 c

Summary

- FPS 2: moderate yields, large berries, late maturing, most susceptible to sour rot. Clearly the worst choice.
- FPS 3 and 5: Highest yields, biggest clusters, medium sized berries, late maturing, excessive (but not the worst) sour rot, performed identically. Use where high yields are desired and sour rot not a problem.

Summary

- FPS 4: moderate yields, moderate numbers of berries/cluster and berry size, good fruit composition, excessive (but not the worst) sour rot. Probably the best "Torino" clone.
- FPS 6: lowest yields (15-25% less than others), few and small berries, much less susceptible to rot than others. Could be the best choice.

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