ASEV/ES 27th Annual Meeting

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Cabernet franc: Viticultural aspects

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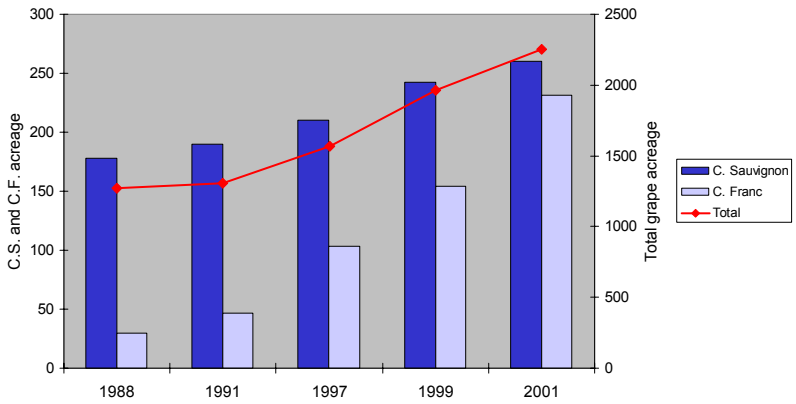
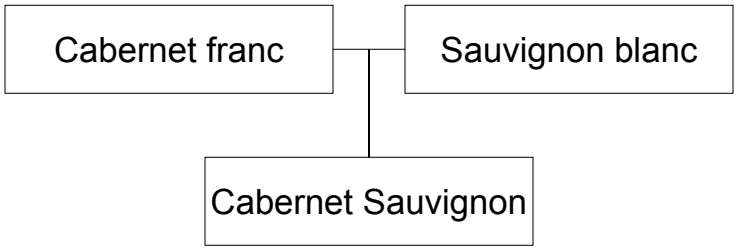
- Danielle LoGiudice, MS student
- Christopher Low, Ag-technician
- Grace Engleman, Ag-technician
- LeAnn Beanland, Research Associate

Virginia acreage of Cabernet Sauvignon and Cabernet franc, relative to total, over last 14 years.



Origins of Cabernet franc



- In Bordeaux since at least the 17th century, perhaps much longer

- Genetic studies strongly suggest that Cabernet franc is one parent of Cabernet Sauvignon
  (Bowers and Meredith, *Nature Genetics* (1997)

Cabernet franc budbreak and bloom at Winchester

	75% budbreak		75% bloom	
	2001	2002	2001	2002
C. franc	20 Apr	17 Apr	7 Jun	3 Jun
Chardonnay	20 Apr	17 Apr	6 Jun	2 Jun
Seyval	25 Apr	19 Apr	7 Jun	4 Jun
C. Sauvignon	27 Apr	19 Apr	12 Jun	7 Jun

Cabernet franc: viticultural aspects

- Rootstocks: C-3309 > SO4 > 101-14 >others
- Clones: #1 >> #214 > #332
  - Some preference of #214 over #1 for color; however, problems with color may be more related to overcropping, regardless of clone.

Cabernet franc: viticultural aspects

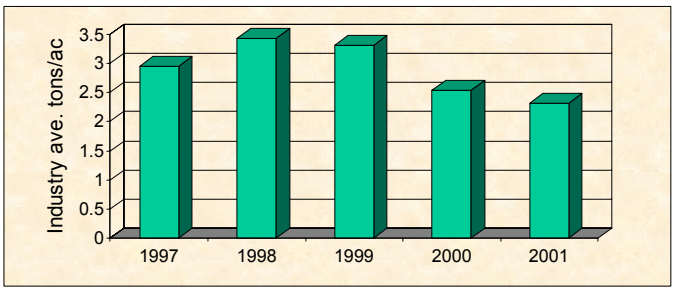
- Training: (upright growth habit)
  - Casarsa (1980s); some conversion to Smart-Dyson Ballerina (12' rows)
  - VSP
  - Open lyre
- Pruning:
  - Mostly cordon-training and spur-pruning

Cabernet franc: viticultural aspects

- Vine spacing: Variable with training
  - 12’ rows common with older (Carsara) and horizontally-divided trellises (e.g., lyre)
  - 9’ to 10’ row widths more common today
  - In-row spacing varies from 4’ to 8’ depending upon vineyard, anticipated vigor, training, and whether irrigation is used.

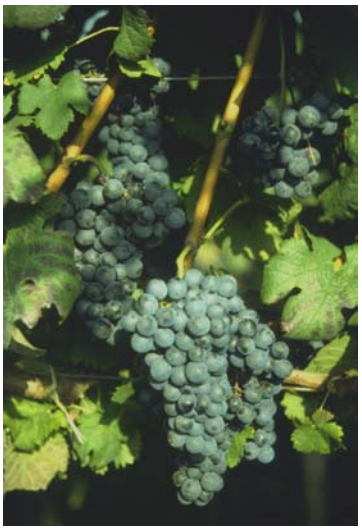
Cabernet franc: viticultural aspects

- Cropping: Variable with training
  - Tendency to overcrop, particularly as evidenced by poor fruit color.
  - Vines 3 years old can easily attain 4 tons/acre if not shoot- and cluster-thinned.



Cabernet franc: viticultural aspects

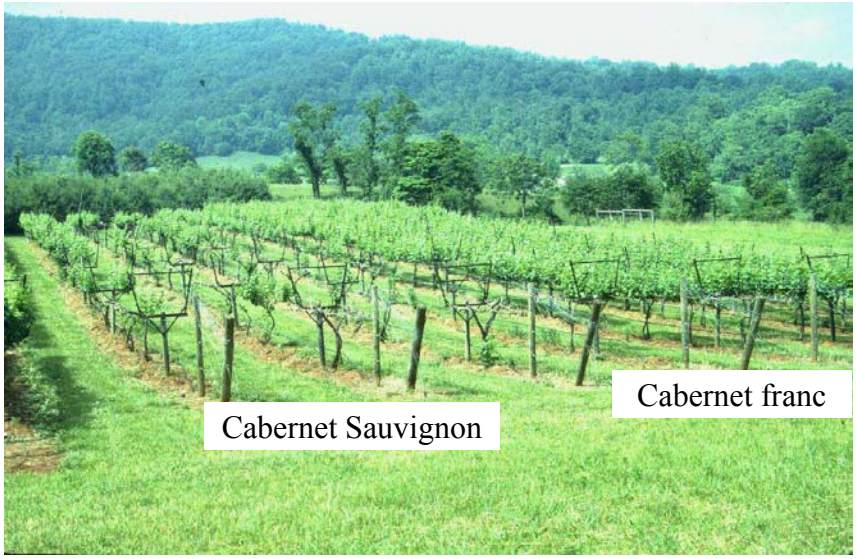
- Cold hardiness
- Leafroll virus
- Bunch stem necrosis
- Research trial at Winchester



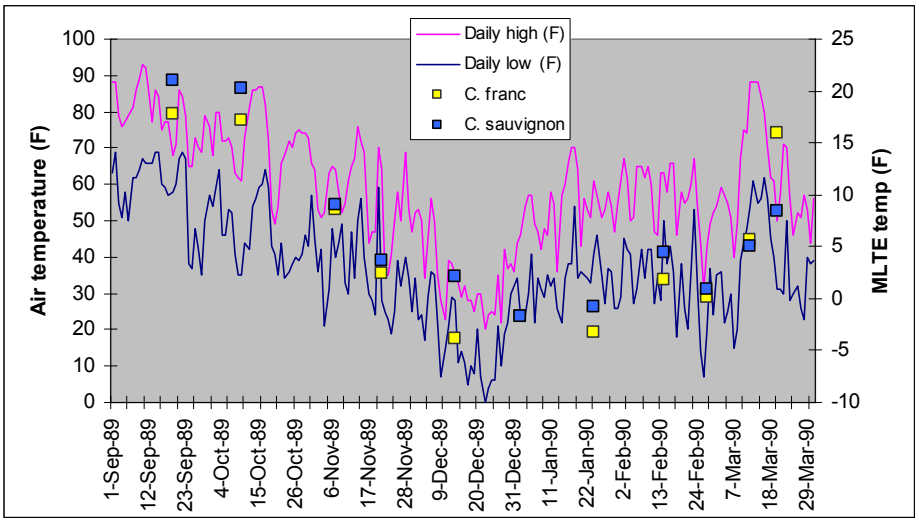
Cabernet franc cold hardiness

- Dormant buds of Cab. franc are typically several degrees more cold hardy than Cab. Sauvignon buds during fall and winter, but Cab. franc deacclimates more rapidly in spring.
- Grower experience consistent with research comparisons for mid-winter hardiness
- Cold injury in last two winters arose due to early fall frost/freeze, and possibly deacclimation in February (2002).

Cabernet franc cold hardiness



Comparison of Cabernet franc and Cabernet Sauvignon bud cold hardiness levels during the 1989-1990 winter: Linden Vineyards, northern Virginia.



Cabernet franc cold hardiness

- In Geneva NY, killing temperature of Cabernet franc given as -17 F, and that of Cabernet Sauvignon as -11 F.
- NY data for mid-winter 2000 shows MLTE for Cabernet franc as -10.4, three degrees (F) more hardy than Cabernet Sauvignon.
  - www.nysaes.cornell.edu/hort/faculty/pool/vinfvar/recreds.html
  - also, Pool, unpublished data

Leafroll virus

- Incidence as much as 40% in older plantings
- Reduced color, yield, possibly cold hardiness
- Less apparent in recent plantings

Late-season bunch stem necrosis

- Thought to be caused by nutrient imbalance(s), but specific nutrient imbalances may differ among vineyards
- Low bloom-time nitrogen concentration in tissues associated with increased Cab. Sauvignon BSN incidence at Winchester (Capps et al., AJEV, 2000)

Cab. Franc in training trial at Winchester AREC: 2000 season (3rd leaf)

Cabernet franc/C-3309

Viognier/C-3309

Traminette/own or C3309

Cab. Franc in training trial at Winchester AREC: 2000 season (3rd leaf)

	GDC	SDY	VSP
Berry wt. (g)	1.6	1.8	1.6
Berries/cluster	90.3	98.4	111.6
Crop/vine (kg)	6.9	5.4	5.0
Tons/ac (equiv.)	4.1	3.2	3.0
Brix	21.0	20.8	20.9
pH	3.33	3.38	3.39

Cab. Franc in training trial at Winchester AREC: **2001** season (4th leaf)

	GDC	SDY	VSP
Berry wt. (g)	1.6	1.6	1.7
Berries/cluster	119	100	102
Crop/vine (kg)	11.8	10.9	6.2
Tons/ac (equiv.)	7.1	6.5	3.7
Brix	22.7	22.6	22.8
pH	3.28	3.26	3.30
Wine total antho. (Abs units)	2.38a	1.82b	1.95b

Canopy light measures taken August 2001

	PAR (% of ambient)			
	GDC	SDY-up	SDY-low	VSP
Cabernet franc	**62.6**	**15.6**	**35.7**	**12.2**
Traminette/C-3309	30.2	12.5	18.8	7.4
Traminette/own	59.4	12.8	16.0	10.8
Viognier	29.3	18.4	29.2	12.6

Source	DF	F	Pr > F
Block	2	0.32	0.7260
Training	3	47.40	**< 0.0001**
Block*Training	6	0.76	0.6105
Variety	3	7.00	**0.0015**
Training*variety	9	4.69	**0.0012**

Cab. Franc: leaf pulling trial in Ontario

	Extent of fruit zone defol.		
	0%	50%	100%
Brix	16.5	16.7	16.5
Wine color density	2.02 b	2.73 a	5.09 a
Total wine anthocyanins (mg/L)	47 b	110 a	126 a

S.L. Staff et al. Canadian J. Plant Science 77(1997).

Cabernet franc: Importance of regulating water supply to vines

- Van Leeuwen and G. Seguin
- study of water supply effects with Cabernet franc in St. Emilion

Soils with abundant water supply (the inverse generally true)

-delayed budbreak, flowering, veraison and harvest

- shoot growth greater

- berry weight greater

- sugar, antho. Phenolics reduced; malic acid increased

Cabernet franc: Concluding remarks

- Acreage is increasing
- Clonal selection will continue, but current clones appear to be of high quality
- Crop control essential to optimize quality
- Adaptable to Mid-Atlantic climate, but not immune to winter injury
- Fruit exposure enhances color development
- Regulation of water availability is desirable