



Long-term additions of organic amendments in a Loire Valley vineyard on a calcareous sandy soil. III. Effects on fruit composition and chemical and sensory characteristics of Cabernet franc wine

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- In this long-term trial (28 years) conducted in a Cabernet franc/3309C vineyard in the Loire Valley of France, the authors compared the effect of various organic amendments on *fruit and wine composition* and on the *sensory characteristics* of the resulting wine. This work offers a unique opportunity to study the effect of various nutritional amendments over the productive lifetime of a vineyard.

- The authors compared the following treatments:

? Crushed, dry, vine prunings	(2 tons/ha)	= VP
? Cattle manure	(10 tons/ha)	= CM10
? Cattle manure	(20 tons/ha)	= CM20
? Spent mushroom compost	(8 tons/ha)	= MC8
? Spent mushroom compost	(16 tons/ha)	= MC16
? Control	(no additions)	

- **Sensory evaluation:** Wines from a selected number of years (1999, 2002, 2003, 2004) were evaluated by 15 trained tasters from the École Supérieure d'Agriculture of Angers (France). Seventeen descriptors (including 1 color descriptor, 8 aroma descriptors, 2 retronasal descriptors, and 6 taste descriptors) were scored on a scale from 0 to 10, anchored at the ends with the words "low" and "high", respectively.

- **Results.**

		CRUSHED PRUNINGS	CATTLE MANURE		MUSHROOM COMPOST	
			LOW RATE	HIGH RATE	LOW RATE	HIGH RATE
FRUIT	Berry weight	↔		↔		↔
	Brix			↓		↓
	TA	↔		↔		↔
	pH			↑		↑
	Anthocyanins			↓		
	Tannins			↓		↓
	N, P, K			↑		↑
	Fermentation rate			↑		

• **Results** (Continued)

		CRUSHED PRUNINGS	CATTLE MANURE		MUSHROOM COMPOST	
			LOW RATE	HIGH RATE	LOW RATE	HIGH RATE
WINE	Ethanol			↑		
	TA	↔				
	pH			↑		
	Anthocyanins			↑		
	Tannins	↔	↔	↔		
	Lightness (L)			↑		
	Chroma (C)			↑		
	Hue (h°)			↑		
SENSORY	Visual color			↓		
	Herbac./vegetative aroma (nose)			↑		
	Animal aroma (retronasal)		↑	↑		
	Overall aroma intensity (retronasal)			↑ or ↓		
	Acidity	↔	↔		↔	
	Bitterness	↔	↔		↔	
	Alcohol	↔	↔		↔	
	Fullness	↔	↔		↔	
	Astringency			↓		
	Persistency			↓		

* Only main effects, happening on most years, presented

• In conclusion, over the last 6 years of this long experiment, treatments with the highest dose of organic amendment, which were the ones providing the heaviest nitrogen supply through mineralization, had a negative influence on grape composition and wine characteristics. In contrast, wines made from the control generally had higher red fruit aroma and higher “aging potential” (based on higher visual color, lower pH, and higher astringency). For this reason, and if the goal is top-quality grapes, the authors recommend to avoid high rates of organic amendments, particularly cattle manure. Finally, the effect of nitrogen on fruit composition depends, besides on soil type, on the weather and the climatic conditions, and the authors did find a significant “organic treatment” x “vintage” interaction. This study is the third of a series of three, the two first dealing with the effect of organic amendments on vineyard soil properties, and vine growth properties, respectively.

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