

Soils and climate of the satellite appellations of Saint-Emilion Château Tour Bayard – Montagne Saint-Emilion

Cornelis van Leeuwen¹ and Laure de Rességuier¹

¹EGFV, Univ. Bordeaux, Bordeaux Sciences Agro, INRAE, ISVV, F-33882 Villenave d'Ornon, France

The appellations Saint-Emilion and Saint-Emilion Grand Cru (5450 ha) are surrounded by four satellite appellations: Montagne Saint-Emilion (1450 ha), Lussac Saint-Emilion (1450 ha), Puisseguin Saint-Emilion (730 ha) and Saint-Georges Saint-Emilion (200 ha). The geology of the satellite appellation is composed of Tertiary sediments, including soft limestone located on the slopes, called “molasses du Fronsadais” (Oligocene), hard limestone located on the plateaus, called “calcaire à Astéries” (Oligocene) and non-calcareous river sediments in the northern part of the area, called (sables du Périgord, Eocene). The topography is gently sloping and extends between 30 m above sea level (m.a.s.l.) and 106 m.a.s.l. Soils are calcareous on 34 % of the area and vary from shallow on the “calcaire à Astéries” to medium depth on the “molasses du Fronsadais”. The texture of the calcareous soils is silty clay. On 66 % of the area soils are non-calcareous and vary in texture from sandy silt to silty clay. The non-calcareous soils are deeper and have generally a greater water holding capacity.

The climate is, on average, cooler in the satellite appellation compared to Saint-Emilion, but temperatures do vary locally. The highest average temperatures are recorded on the limestone plateaus, while temperatures are lower in the northeastern part of the area.

The wines from the satellite appellations used to be not as famous as the wines from Saint-Emilion. Because of the cooler climatic conditions, maturity was more difficult to achieve. With climate change, this handicap is progressively turning into an advantage and wine quality is steadily increasing in this area.

One of the soil types of château Tour Bayard (Montagne Saint-Emilion) is a shallow lime holding clay-silt soil. Traditionally Merlot was the major variety on this soil type, but with climate change increasing proportions of Cabernet franc are grown and, more marginally, Malbec. Wines produced on this soil type are powerful and conserve good freshness, despite moderately high alcohol levels. They have a very good ageing potential.

Keywords : Soil, Climate, Saint-Emilion, satellite appellation, château Tour Bayard, Montagne Saint-Emilion

Soils and climate of the satellite appellations of Saint-Emilion Château Tour Bayard – Montagne Saint-Emilion

Cornelis (Kees) van Leeuwen and Laure de Rességuier

EGFV, Univ. Bordeaux, Bordeaux Sciences Agro, INRAE, ISVV, F-33882 Villenave d'Ornon, France



The Saint'Elites

- Clos Albertus
- Château La Couronne

- Château Corbin
- Château De La Grenière
- Château Guibot La Fourvière
- Château Rigaud

- Château La Rose Perrière
- Château Tour Bayard îlot 1
- Château Tour Bayard îlot 2
- Château Vieux Bonneau

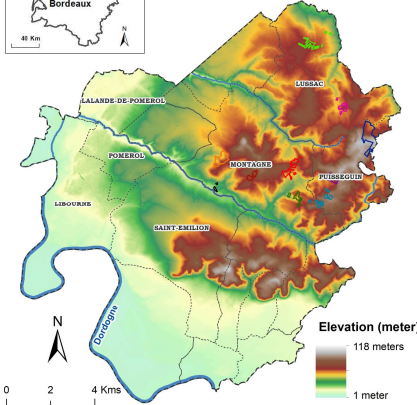


Additional information on the terroir of the Saint-Elites association

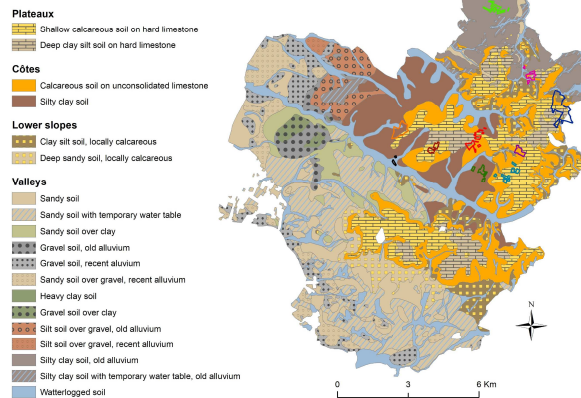


Additional information on the terroir of Saint-Emilion with multiple interactive maps (Adviclim project)

Topography map of Saint-Emilion, Pomerol and their Satellite appellations

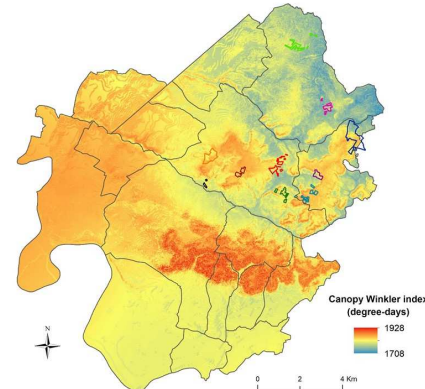


Soil map of Saint-Emilion, Pomerol and their Satellite appellations



Geology, topographie and soils have a high degree of similarity between Saint-Emilion and its satellite appellations

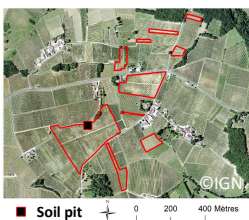
Canopy Winkler index map (average 2012-18) of Saint-Emilion, Pomerol and their Satellite appellations



The climate is cooler in the satellite appellations compared to Saint-Emilion and Pomerol

Château Tour Bayard PDO Montagne Saint-Emilion

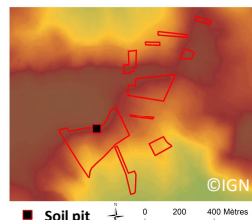
Parcels of château Tour Bayard



Soil pit parcel informations:

- Plant material: Malbec/?
- Planting year: 1962

Digital Elevation Model



Topography:

Top of the hill, 67 m.a.s.l.
South-East exposure

Geology map



Geology:

Molasse du Fronsadais
(Oligocene)



Soil type (Fr):

CALCOSOL superficiel sur molasses du Fronsadais

Soil type (En):

Shallow calcareous clay-silt soil on soft limestone bedrock (molasses du Fronsadais)

Parcel "Malbec"	Horizon 1	Horizon 2	Horizon 3
DEPTH (cm)	0-25	25-60	60-120
COURSE ELEMENTS (>2 mm) (%)	2%	2%	0%
FINE EARTH (%)	98%	98%	100%
Coarse sand	13%	9%	2%
Fine sand	8%	10%	7%
Coarse silt	20%	17%	22%
Fine silt	26%	30%	47%
Clay	33%	35%	23%
TEXTURE	Clay-silt	Clay-silt	Silty-clay
ORGANIC MATTER (%)	2.2	<0.6	-
ORGANIC CARBON (%)	1.3	-	-
TOTAL NITROGEN (%)	0.145	0.037	-
C/N ratio	8.9	-	-
pH (water)	8.4	8.6	8.6
pH (KCl)	7.7	7.9	8.0
ADSORBANT COMPLEX			
K ⁺ cmol ⁺ /kg	0.68	0.36	0.25
Mg ²⁺ cmol ⁺ /kg	1.73	1.29	0.99
Ca ²⁺ cmol ⁺ /kg	++	++	++
S (sum of cations)	++	++	++
V (saturation rate)	Sat.	Sat.	Sat.
C.E.C cmol ⁺ /kg	16.3	11.3	7.4
Total Ca (%)	23%	39%	69%
Active Ca (%)	9%	15%	15%
IPC	>200	-	-
P ₂ O ₅ g/kg Joret-Hébert	0.03	0.03	0.033
TRACE ELEMENTS			
Cu exch. mg/kg	1.2	<0.5	0.5
Mn exch. mg/kg	1.1	1.9	6.7



Soil description:

- Parent rock appears at 60 cm
- Gradient of increasing CaCO₃ from top soil to parent rock
- Clay-silt texture in topsoil, silty clay texture in subsoil
- Low content in organic matter and total nitrogen due to erosion
- No visible roots deeper than 85 cm
- Limited water supply due to:
 - topography
 - restriction of rooting depth



Recommended plant material:

- Rootstock should be moderately resistant to limestone: 420A recommended, 161-49C possible
- SE exposure: Merlot, Malbec and Cabernet franc are possible options



Wine style:

- Powerful wines
- Wines preserve freshness and complexity
- With climate change, the proportion of Malbec and Cabernet franc should be increased in this location