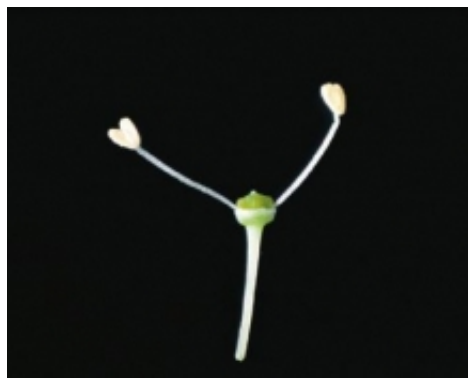




## 333 Ecole de Montpellier



### Name of vine variety in France (and common name)

333 Ecole de Montpellier (333 EM)

### Breeder and year of obtention

Gustave Foëx, 1883

### Genetic origin

This variety was derived from the crossbreeding of *Vitis vinifera* cv. Cabernet-Sauvignon N and *Vitis berlandieri*.

### Evolution of areas under rootstock nurseries

|    | 1945 | 1955 | 1965 | 1975 | 1985 | 1995 | 2005 | 2015 |
|----|------|------|------|------|------|------|------|------|
| ha | 2    | 7    | 15   | 43   | 18   | 12   | 8    | 16   |

### Estimated surface area of French vineyards grafted with this rootstock and the

4 000 ha. Champagne, Charentes

### Ampelographic description

Identification signs include:

- the tip of the young shoot is open and has an anthocyanin pigmentation on the edges and a heavy coat of flat-lying hairs,
- the young leaves are reddish,
- the shoot has a very ribbed contour and a circular or slightly elliptical section and an absence of upright or flat-lying hairs,
- adult leaves are orbicular, whole or 5-lobed with a bubbled and shiny leaf blade, upturned and twisted on the edges, a slightly opened or slightly overlapping folded petiolar sinus oftentimes limited by the vein near the petiolar point,
- male flowers,
- vine shoots are very ribbed.

### Genetic profile

| Microsatellite | VVS2 | VVMD5 | VVMD7 | VVMD27 | VRZAG62 | VRZAG79 | VVMD25 | VVMD28 | VVMD32 |
|----------------|------|-------|-------|--------|---------|---------|--------|--------|--------|
| Allel 1        | 137  | 217   | 231   | 238    | 194     | 248     | 238    | 235    | 239    |

| Microsatellite | VVS2 | VVMD5 | VVMD7 | VVMD27 | VRZAG62 | VRZAG79 | VVMD25 | VVMD28 | VVMD32 |
|----------------|------|-------|-------|--------|---------|---------|--------|--------|--------|
| Allel 2        | 147  | 229   | 239   | 250    | 220     | 260     | 250    | 235    | 257    |

## Resistance to soil parasites

333 EM has a moderate to high degree of tolerance to radicolae phylloxera. It is sensitive to the nematodes *Meloidogyne incognita* and *Meloidogyne arenaria*.

## Adapt to environment

333 EM is characterized by its very good adaptation to limestone soils and its resistance to chlorosis. It resists in fact up to 60% total limestone, 40% active limestone and a CPI of 70.

This root stock is likewise well adapted to drought and temporary excess humidity in the spring. On the other hand, it is sensitive to chlorides. 333 EM is well adapted to shallow, dry and limestone soils.

## Interaction with grafts and production objectives

The vigor of 333 EM to grafts is high and produces fairly high yields. It can however sometimes promote the onset of coulure. The first development of plants is fairly slow with this root stock. Under not very fertile or limiting conditions, 333 EM produces good quality products.

## Aptitudes for plant propagation

Wood production is very low (10 000 to 30 000 m<sup>3</sup>/ha) and climatic conditions in the autumn must be favorable in order to obtain good lignifying of vine shoots. The propagation by cuttings capacity of 333 EM is moderate. It displays good capacity for grafting but large wood diameter may be bothersome.

## Resistance to aerial parasites

333 EM displays a high degree of tolerance to gallicolae phylloxera and moderate resistance to downy mildew. On the other hand, it is very sensitive to leaf blister mites.

## Clonal selection in France

The 4 approved 333 EM clones carry the numbers 260, 263, 1049 and 1105.



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