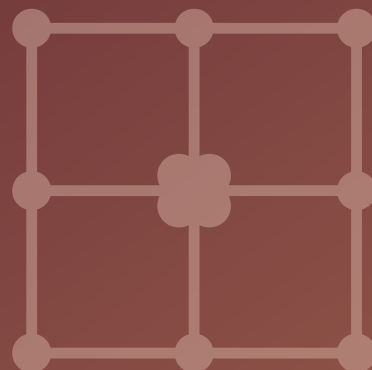


The Maggiorina in Boca

Historic vine training system, structure, soils, productivity and present-day significance

Boca, Province of Novara
As of August 2026



A vineyard like a small piece of architecture

Maggiorina is not a grape variety. It is a historic planting, support and vine training system of Alto Piemonte, especially around Boca, Maggiora and Ghemme.

At the centre of a large square, three or four vines usually stand close together. Their long fruiting canes are trained outwards in a star shape and supported by a three-dimensional framework of chestnut posts. The system brings together viticulture, local materials and a surprising amount of structural thinking.

The most important distinction

Porphyry-rich soils explain the particular site of Boca. They do not explain the Maggiorina itself. The same training system is also found in areas with different geology.

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3 to 4

Vines usually stand at the centre of one module.

approx. 4 × 4 m

Frequently cited size of a historic module.

approx. 8

Depending on the variation, chestnut posts form the supporting framework.

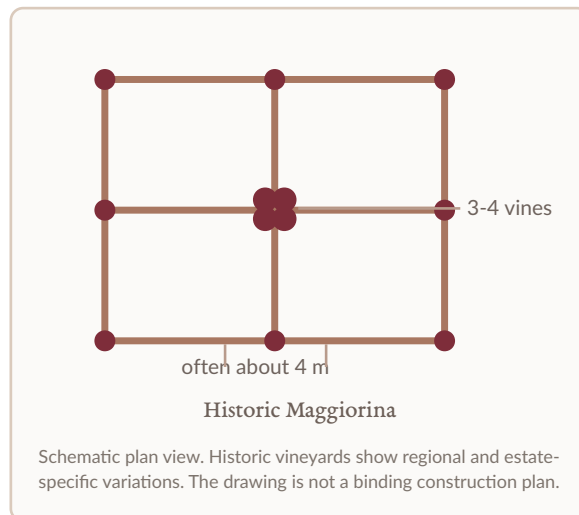
by hand

Pruning, tying, maintenance and harvest can only be mechanised to a limited extent.

How a Maggiorina is constructed

Maggiorina was never standardised down to every detail. Historic vineyards vary in the number of vines, the position of the posts and the training of the fruiting canes. What they share is a three-dimensional, radial structure.

- 1 **Central vines:** usually three or four vines are planted very close together.
- 2 **Long arms:** the fruiting canes are trained outwards, often in roughly four directions.
- 3 **Supporting framework:** several chestnut posts carry the weight of the long arms, leaves and bunches.
- 4 **Inclined posts:** some posts lean slightly outwards, allowing the structure to counterbalance itself.
- 5 **Three-dimensional canopy:** unlike a modern vineyard row, the leaf area develops around a central point.



The role of Alessandro Antonelli

The Piedmontese architect Alessandro Antonelli is credited with geometrically and structurally refining an existing system in the nineteenth century. The inclination of the posts was probably the decisive element. Outward forces could counterbalance the weight of the long vine arms. No reliably documented standard angle is known.

Why the Maggiorina made sense in Boca

The system did not arise from a single cause. It suited a form of farming based on handwork, local materials, small hillside plots and mixed grape varieties.

WIND AND LOAD

A framework that stabilises itself

The hills of Boca are exposed to air currents from Monte Rosa. At the same time, long vine arms, foliage and bunches must be supported. Inclined posts and opposing tensile forces made the structure more resistant.

LIGHT AND SPACE

Leaf area in several directions

Shoots spread around the centre, allowing light to enter the canopy from different directions. However, a direct scientific comparison with modern row systems in Boca is lacking.

TERRAIN

Suited to slopes and handwork

Historic Maggiorine often stand on steep or terraced sites. As long as the work was carried out by hand anyway, the three-dimensional structure was not a decisive disadvantage.

MATERIAL

Chestnut from the surrounding woods

Chestnut wood was available in nearby forests, durable and well suited to posts. The system required neither concrete posts nor elaborate metal structures.

The turning point

With tractors, mechanical soil cultivation and mechanised canopy work, the strength of the Maggiorina became its greatest weakness. The radial frameworks are difficult to integrate into efficient workflows.

Mixed varieties as part of the system

Many historic vineyards were planted as mixed field blends. Nebbiolo, Croatina, Vespolina, Uva Rara, Barbera and occasional white or rare local varieties stood side by side. Different ripening times could spread the harvest. A deliberate role as insurance against weather or poor flowering is plausible, but not documented for every historic vineyard.

The soils of Boca

Boca does not have a single soil type. Its vineyards lie on a geologically varied mosaic of heavily weathered volcanic rock, morainic deposits and fine-soil layers of differing depth.

Porphyry, tuff and breccia

A large proportion of the known sites lies on volcanic parent rock. These rocks belong to the exposed caldera of the extinct Valsesia supervolcano. The major eruption is dated to about 283.46 million years ago.

Moraines and redeposited material

Glaciers and watercourses brought mixtures of clay, sand, silt, granite debris, porphyry fragments and, in places, dolomitic material onto the slopes.

Weathering and fine soil

Rooting depth, water retention and nutrient supply depend on weathering depth, stone content, slope position and fine-soil fraction. Neighbouring plots can therefore respond differently.

What the soil means for the vine

Soil affects the vine mainly through water availability, rooting conditions, nutrient supply and vigour. A general statement such as «Maggiorina vineyards are always dry and nutrient-poor» would be wrong. The training system and the soil are two separate levels.

ESTABLISHED

Porphyry-rich and stony soils can have a marked influence on water balance and vine growth.

NOT DIRECTLY DEMONSTRABLE

The simple equation «porphyry in the soil equals a mineral taste in the wine» is not scientifically sustainable. Rock itself is not tasted.

Systematic and comprehensive values for pH, organic matter and water retention are not available for the historic Maggiorina plots.

How dense and productive is a Maggiorina?

No universally valid productivity figure can be given. Vine age, variety, pruning, missing vines, soil, vintage and care all affect yield. The geometry does, however, allow theoretical planting densities to be calculated.

$4 \text{ m} \times 4 \text{ m} = 16 \text{ m}^2$ per module
 $10,000 \text{ m}^2 \div 16 \text{ m}^2 = 625$ modules per hectare

$625 \text{ modules} \times 3 \text{ vines} = 1,875$ vines per hectare
 $625 \text{ modules} \times 4 \text{ vines} = 2,500$ vines per hectare

Purely theoretical calculation. Tracks, walls, banks, irregular spacing and missing vines are not included.

Measure	Value	Interpretation
Theoretical density with 3 vines	1,875 vines/ha	Calculated from a 4×4 m module.
Theoretical density with 4 vines	2,500 vines/ha	Again excluding tracks and missing vines.
Minimum density for new Boca plantings	3,000 vines/ha	Current rule for new and replanted vineyards, as of August 2026.
Maximum Boca yield	8.00 t/ha	Legal ceiling, not the average for a Maggiorina.
Maximum yield with «Vigna»	7.20 t/ha	Reduced ceiling for wines carrying a vineyard name.

A specific example

A yield of 5,290 pounds per acre was reported for a Maggiorina wine from Le Piane. The conversion gives approximately 5.93 tonnes per hectare.

$5,290 \text{ lb/ac} \times 0.453592 \text{ kg/lb} = 2,399.5 \text{ kg per acre}$
 $2,399.5 \text{ kg} \div 0.404686 \text{ ha} = 5,929 \text{ kg/ha}$

Result: approximately 5.93 t/ha

Difference from the 8.00 t/ha ceiling:
 $(8.00 - 5.93) \div 8.00 \times 100 = \text{approximately } 25.9\%$

This figure is one producer example. It does not prove that Maggiorina is inherently lower-yielding. Old vines, mixed varieties, missing vines and deliberate pruning can affect yield as much as the training system itself.

The verdict is clearer when it comes to labour

Maggiorina can produce good grapes. Economically, however, it is demanding because almost every operation must be carried out individually.

Where the time is lost

- Pruning long arms distributed through space
- Tying and renewing the framework
- Canopy work in several directions
- Plant protection in irregular canopies
- Harvesting small, steep and often terraced plots
- Maintaining and replacing chestnut posts

What cannot be quantified responsibly

Reliable general figures for labour hours per hectare or additional costs per kilogram of grapes are lacking. The exact increase in cost therefore cannot be stated.

Yield per vine and yield per hectare

The small number of central vines per hectare should not be confused with a low yield per unit of land. One Maggiorina group has a much larger canopy than a vine in a tightly spaced modern row. The decisive factor is therefore not only the number of vines, but the total bearing surface of wood and leaves.

Maggiorina is not automatically unproductive. Above all, it is labour-intensive and difficult to mechanise.

Why modern row systems prevailed

Guyot rows and similar systems provide even spacing, continuous tractor lanes and standardised work. Maggiorina, by contrast, requires attention from vine to vine. Once labour became expensive and mechanisation important, the economic outcome was fairly clear.

Historic field blends and today's Boca rules

Historic Maggiorine were often mixed vineyards. Nebbiolo, locally called «Spanna», Croatina, Vespolina, Uva Rara, Barbera and occasional white or rare local varieties could all stand in the same plot.

EXAMPLE OF AN OLD PLANTING

Montalbano at Le Piane

Croatina	approx. 70%
Nebbiolo	approx. 10%
Vespolina	approx. 10%
Other varieties	approx. 10%

The other varieties include Erbaluce and the so-called Malvasia di Boca.

BOCA DOC, AS OF AUGUST 2026

Permitted composition

Nebbiolo or Spanna:
70-90 per cent

Vespolina and Uva Rara:
individually or together 10-30 per cent

Croatina, Barbera and white varieties are not part of the prescribed Boca blend.

Training system and appellation are two different things

A wine from a historic Maggiorina is not automatically Boca DOC. It must also comply with the permitted varieties, yields, geographical boundaries and ageing rules. A traditional field blend may therefore be bottled simply as red wine even when its grapes grow within the Boca area.

Why the diversity matters today

Old mixed vineyards preserve not only grape variety names, but also individual old vines and genetic variants. They are therefore a living archive. Their value lies not only in the wine of one harvest, but also in conserving plant material that is scarcely found in modern single-variety vineyards.

From ancient precedents to decline

Antiquity

Pliny the Elder described vines north of the Po trained on trees, high posts and forked supports. This shows an old northern Italian tradition of three-dimensional vine training. It does not, however, clearly describe the later Maggiorina structure with its square plan and chestnut posts.

Nineteenth century

Alessandro Antonelli is said to have improved the geometry and structural stability of the existing system. He did not invent it, but probably made it more precise and resistant.

approx. 1910-1920

Some vineyards that still survive today were planted in this period after the phylloxera crisis. Individual vines remain productive.

from the 1950s

Many Maggiorine were abandoned or replaced by simpler row systems. At the same time, numerous marginal slopes were reclaimed by woodland.

since 2010

Conservation work, variety identification and scientific cooperation have brought the old vineyards back into focus.

since 2023/2024

A cross-regional initiative links people who want to document and preserve Maggiorina vineyards. A complete inventory of the area still does not exist.

Why it almost disappeared

- high demand for manual labour
- difficult mechanisation
- small and fragmented plots
- steep or terraced slopes
- departure from farming
- maintenance of wooden frameworks
- simpler modern training systems
- low profitability of many marginal sites

What remains today

No reliable total figure exists for the area still managed with the Maggiorina system. The documented vineyards nevertheless show how small and fragmented the surviving heritage has become.

more than 10

Small old plots at Montalbano, each approximately 1,000-2,000 m².

approx. 1.5 ha

Combined area of these documented Montalbano plots.

5 more

Old Maggiorina vineyards at Le Piane, Santuario and Traversagna.

approx. 1 ha

Additional area represented by these five vineyards.

These figures refer to the documented holdings of one producer and should not be understood as the total area in Alto Piemonte.

Preservation means more than replacing posts

FRAMEWORK

Old posts and ties must be renewed without losing the three-dimensional form.

VINES

Very old vines require individual care. Missing vines raise the question of suitable replacement material.

VARIETIES

Rare or unknown vines must be identified, propagated and documented.

The value of Maggiorina today lies less in maximum productivity than in its role as a living archive.

It preserves historic working methods, local grape varieties, individual old vines and a landscape form that has almost completely disappeared with the modern vineyard row.

What is documented and what remains uncertain

Well documented

- three-dimensional system with central vines and radially trained arms
- several posts, traditionally often made of chestnut
- technical refinement associated with Antonelli
- high labour demand and limited mechanisation
- sharp decline during the twentieth century

Plausible, but rarely measured

- favourable spatial distribution of leaf area
- structural advantages against wind and weight
- risk spreading through mixed grape varieties
- adaptation to farming based heavily on manual labour

Not generally confirmed

- inherently fewer fungal diseases
- reliable protection from hail or frost
- deeper roots than Guyot-trained vines
- automatically lower yields
- inherently better or more complex wines
- a precisely prescribed Antonelli angle

The sober conclusion

Maggiorina is not a mystical trick of porphyry-rich soils. It is a sophisticated pre-industrial answer to hilly terrain, wind, long vine arms, available handwork, local materials and mixed grape varieties.

Its strength was the stable spatial distribution of a small number of large vines. That same structure becomes its weakness as soon as tractors, machinery and paid working hours enter the equation.

Conclusion

It cannot be confirmed that Maggiorina automatically produces better wine than a well-managed modern vineyard. What is beyond doubt is that it is technically intelligent, culturally and historically exceptional, and valuable for preserving old vines.

A short glossary

Vine training system

The way a vine is structured, pruned, supported and guided through space.

Fruiting cane

One-year-old wood from which fruit-bearing shoots grow during the following season.

Field blend

A vineyard in which several grape varieties grow together and are often harvested at the same time.

Spanna

The traditional local name for Nebbiolo in Alto Piemonte.

Porphyry

A volcanic rock with larger crystals set in a finer matrix. In Boca it is often heavily weathered.

Vespolina and Uva Rara

Historic red grape varieties of Alto Piemonte that play a complementary role alongside Nebbiolo in Boca.

The figures at a glance

Topic	Indicative figure
Size of a frequently described module	approx. 4 × 4 m
Vines per module	usually 3-4
Theoretical planting density	approx. 1,875-2,500 vines/ha
New Boca plantings, minimum density	3,000 vines/ha
Maximum Boca yield	8.00 t/ha
Maximum yield with «Vigna»	7.20 t/ha
Calculated producer example	approx. 5.93 t/ha
Age of the major Valsesia eruption	approx. 283.46 million years

Legal figures and grape variety requirements are current as of August 2026. Historic vineyards vary, so individual dimensions should not be treated as a binding construction plan.