

## ITALY

### PEDO-CLIMATIC CONDITIONS:

The climate in the region is Mediterranean, characterised by mild winters and warm summers. Maximum temperatures in summer often exceed 32 °C (with peaks of 40 °C) and occur in July and August, most frequently in July. The average minimum temperature is about 4 °C. In the winter months, the minimum temperature drops below 8 °C for several days. There are generally no exceptional weather events, except occasional short hailstorms. Rainfall is unevenly distributed and concentrated in a few months, mainly in autumn and winter. The driest months are generally June, July, and August. Rainfall is between 500 and 700 mm/year. Soils in the Marche region are generally leached brown soils.

### CROP: Quinoa

This crop is an annual herbaceous plant in the Amaranthaceae family, which also includes spinach and beet.

The ideal soil for quinoa is loamy, well-drained, and well-endowed with organic matter, with moderate slopes. However it can adapt to clay or sandy soils, as long as the required nutrients are present (the plant is demanding in terms of nitrogen and calcium, and moderately demanding in terms of phosphorus and potassium) and there are no water stagnation problems, as quinoa is very sensitive to excessive moisture, especially in the early stages of vegetation.

The most cultivated varieties at present are Titicaca and Vikinga, which are low in saponins, followed by Regalona.

Quinoa Marche uses both 'bitter' varieties (Titicaca), which are more rustic but with inferior grain qualities (dark and bitter, requiring a pearling step), and the sweet varieties (Dutchess and Bastille), which are high-performing varieties, given optimal soil and climatic conditions, and have a light and sweet grain.

Harvested volumes can range from 1 ton per hectare to 3 ton per hectare, depending on the vintage.

Variety	Average production (ton/ha)
TITICACA	2,2
DUTCHESS, BASTILLE	1,8

*Table 1: Average production (ton/ha) based on the varieties*

## BEST AGRICULTURAL PRACTICES:

- **Organic regenerative practices applied:**

This farm adopted the practices proposed by Arca.

These agronomic practices:

- Comply with organic production regulations.
- Adopt a balanced multi-annual rotation plan (more than five years), based on the suitability of the land, by promoting crop diversification for each individual farm and favouring the adoption of mixed crops over monocrops.
- Allow the natural regeneration of soils, where possible, through reduced tillage and direct sowing.
- Insert cover crops between different cash crops, with the aim of keeping the soil covered all year round
- Apply balanced organic fertilisation, with a resulting soil amendment and nutrient effect.
- Govern the soil's water regime and maintain efficient hydraulic-agricultural systems by ensuring proper rainwater runoff.
- Provide permanent or controlled grassing between the rows of specialised tree crops, increasing the supply of organic matter and reducing erosion
- Preserve a buffer strip along main and secondary watercourses.

- **Such agronomic practices are:**

- **Best practices for sowing :**

Quinoa seeds, like those of spinach, cannot germinate if the soil temperature is too high. In order to remedy this, it may be necessary to place them in a refrigerator (vernalisation).

In the Northern Hemisphere, the optimal time for sowing is between April and May, with a recommended seed density of 10 to 12 kg/ha.

Quinoa cultivation in Italy has the following limitations: temperatures above 32-34°C, even for a short time, tend to cause pollen sterility in most crops, while high rainfalls and high atmospheric humidity cause germination of mature seeds that are still on the plant.

A precision seeder is generally used for planting quinoa (and is also used for other crops such as sunflower).



*Picture 1: Detail of quinoa associated with French Honeysuckle*

- **Best practices for managing the crops chosen:**

One of the most important operations for this crop is weeding, which helps control the weed flora present between the rows.

- **Best practices for harvesting the chosen crops:**

In Italy, quinoa is harvested at the end of summer, using a cereal combine harvester, with the settings normally used for clover or alfalfa. After the harvest, pre-cleaning, decortication, and, in some cases, desaponification of the seed, will follow. These processes are needed in order to make the seeds usable and edible.



*Picture 2: Quinoa associated with French Honeysuckle*

## CONTACT

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