



1. PROJECT SUMMARY SHEET:

The project idea is intended to be a point of synthesis between some evolutionary data of the Lombardy wine sector, the effects of climate change, the introduction of new technologies primarily related to "precision" approaches and a growing awareness that any strategic and technical choice must be able to reconcile the aspects, not always collimating, of agronomic, economic and environmental sustainability. Considering that viticulture in Lombardy is mainly developed on the main provinces of Pavia and Brescia, which still account for about 85% of the regional vine sector as a whole under the Oltrepò Pavese and Franciacorta denominations, the project identifies a series of common and specific needs, which concern these two poles and proposes suitable solutions in terms of method and implementation.

More in detail:

Both areas have an urgent need to increase their competitiveness with respect to other wine-growing realities inside and outside the region.

On companies that are certainly representative samples of the two areas in terms of surface area and vine varieties, we intend to use the instrument of the vigor map with different spatial resolution to achieve two primary objectives:

- a) To characterize the degree of "spatial" and, within the limits dictated by the project, "temporal" variability of the vigour currently present in plots which, given their classical counter-espalier form, must be representative of the main grape varieties of the two areas. In Oltrepò Pavese, vineyards of Croatina, Pinot Nero and Barbera will be considered; in Franciacorta, Chardonnay, Pinot Bianco and Pinot Nero.
- b) Determine, for the levels of vigour identified, through an accurate "calibration" activity on the soil which will include, in addition to agronomic parameters of vigour, obviously, also production and quality indexes, which are the levels of vigour that, better than others, achieve the grapes with the best compositional characteristics (different, obviously, depending on the type of vinification envisaged).
- c) Identify the most correct decision-making choices in terms of "exploitation" or "correction" of the observed variability in order to maximize all elements of sustainability.

In addition, the project intends to address two specific needs that arise for the wine-growing district of the Pavia area:

- 1) The territory is characterized by the presence of lithotypes and even very steep slopes that predispose to a high risk of erosion and landslide with a probable loss of organic fertility and, ultimately, of productive and qualitative potential. Therefore, it is considered a priority to include among the planned activities the evaluation of the effects that the various soil management techniques in place or proposed within the project (inter-row working/inbursement, sub-row, etc.) may have on the soil geological characteristics (density) and water dynamics (infiltration, permeability, retention capacity).
- 2) The aim is to increase the resilience of the vineyards to extreme rainfall events by reducing hydrogeological instability (erosion, surface landslides) that cause serious structural damage to the plants and the loss of large quantities of organic matter. The activity plan includes the selection of sites characterised by management techniques representative of the area under consideration or proposed as part of the project to carry out the following.

(2) Croatine problem. The Croatina vine (or more typically Bonarda) is still the most cultivated black variety in the province of Pavia with over 2700 hectares. It has always been considered a "difficult" vine due to a reduced fertility of the basal buds which, in addition to making it unsuitable for medium-short pruning, also increases the risk of alternating production cycles in terms of both quantity and quality. The specific need is, in this case, for an innovative technique that can lead to a significant increase in the fertility of the basal knots or, at least, an increase in the productivity of a long fruited head which, in the basal portion, is always lower and/or variable. With this in mind, the plan provides for:

(a) the harvesting, in the dormancy phase, of a potential fruit head per plant, in order to quantify the following parameters in the laboratory: potential fertility (number of primroses per bud), percentage of necrotic, sterile, fertile buds

(b) (a) On reaching the phenological phase of 'visible inflorescences', the number of inflorescences per sprout shall be noted according to the insertion position on the fruiting head in order to calculate the actual field fertility.

Two specific needs have also been identified for the Franciacorta district

- Late pruning. A technique, however, already corroborated by recent experimental validations conducted in various areas and on different grape varieties, which undoubtedly deserves to be included in the plan of activities, is that which provides, regardless of the type of pruning adopted (long Guyot or short on permanent cordon) a particularly late winter pruning period that has a dual and important purpose:

a) post-sprouting of about 15-20 days, i.e. a period of time that is long and therefore able to "affect" the probability of incurring a disaster

(b) to be able to extend this delay, or part of it, to the ripening stage, thus making it possible to take advantage of a period of the year that is normally cooler than the central summer months. It is clear that this last objective is particularly important in the case of sparkling or sparkling wine making.

- Irrigation 4.0. Especially in the Franciacorta area, the probability of the occurrence of episodes of summer water stress often associated with days that, not infrequently, reach a maximum temperature of almost 40°C, is creating significant drawbacks if the aim is to reach maturity with grapes that maintain not only the necessary acidity, but also fresh aromas. It is therefore necessary to accustom the territory to an irrigation management that, compared to traditional and often impromptu rescue operations, often dictated by experiential logic or, even worse, emulation, pursues two primary objectives: a) to be managed with the help of agricultural techniques 4.0 in order to introduce elements not only of automation but also of rationalization of why it is necessary or not to intervene with the irrigation contribution in certain periods b) to evaluate the applicability of a new air conditioning irrigation system that, using the same air hose is able to activate through a thermal algorithm that starts irrigation whenever T and RH exceed set threshold values (eg. $T > 35^{\circ} \text{C}$ and $\text{RH} < 70\%$).

The project also includes experimentation with new oenological stabilization techniques that are effective in maintaining freshness of taste.