

# GRAPE GROWING

## The Winegrower or Viticulturist

### The Winegrower's Craft

- Decades ago, winegrowers learned their craft from previous generations, and they rarely tasted with other winemakers or explored beyond their village.
- Today's winegrowers have advanced degrees in enology and agricultural sciences, and they use knowledge of soil chemistry, geology, climate conditions and plant heredity to grow grapes that best express their vineyards.
- Many of today's winegrowers are influenced by different wines from around the world and have worked a *stagé* (an apprenticeship of a few months or a harvest) in regions around the world.
- A little more than a generation ago, in many wine regions, the roles of winegrower and winemaker were separate; the former grew grapes and the latter, either a *négociant* or a winery, would buy the grapes and vinify them

into wine. Today, one person may fill both roles, or frequently a winery will employ a person for each role.

### The Winegrower's Tasks

- In winter, the winegrower begins pruning and this starts the vegetative cycle of the vine. He or she will take vine cuttings for indoor grafting onto rootstocks which are planted as new vines in the spring, a year later. The winegrower turns the soil to aerate the base of the vines.
- In spring, the winegrower removes the mounds of earth piled against the base of the vines to protect against frost. He or she will plant year-old nursery cuttings and tie down canes on wires. In frost-prone regions like Chablis and Champagne, winegrowers run heaters in the vineyards at night. If needed, the winegrower applies treatments against oidium, mildew and insects.

- In summer, the winegrower does leaf thinning, removing excess foliage to expose the flower sets, and green pruning, taking off extra bunches, to control the vine's yields and to ensure quality fruit is produced. Winegrowers continue treatments, eliminate weeds and trim vines to expose fruit for maximum ripening. Winegrowers control birds with netting and automated cannons.
- In fall, as grapes ripen, sugar levels and color increases as acidity drops. The winegrower checks sugar levels continuously to determine when to begin picking, a critical decision for the wine. In many areas, the risk of rain, hail or frost is an ever-present danger. A month later, winegrowers cover the base of the vines with soil to protect against frost. The winegrower will spread manure and compost and gather the year's shoots for burning.

## Methods of Viticulture

### Vine Training & Pruning



#### Bush or Gobelet

In Mediterranean or hot wine regions, vines are bush trained (called bush in California, gobelet in southern France, en vaso in Spain, alberello in southern Italy and Sicily). The leaves protect bunches from harsh sunlight and receive light from any orientation. These tend to be older, low-density vineyards. (1,000-5,000 vines/hectare)



#### Cordon de Royat

In cool-climate regions, vines are wire-trained on trellises and are pruned in Cordon or Guyot systems, or variations like Smart-Dyson. Vegetation and grape production are easier to control, but since leaf and bunch exposure are fixed, vineyards are planted in a specific orientation. These tend to be high-density vineyards. (9,000-12,000+ vines/hectare)



#### Guyot

Double Guyot is Bordeaux's favored training system while it's single Guyot in Burgundy, for Pinot Noir and Chardonnay. Increasingly, Burgundians are using Cordon for Pinot due to better bunch spacing and more controlled harvest.

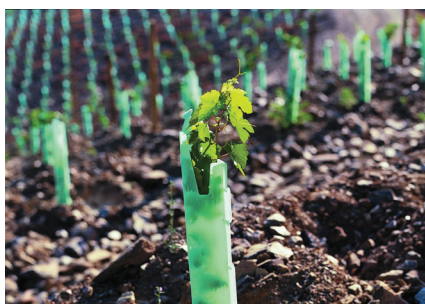


#### Pergola

In Spain's Galicia, with its cool, wet Atlantic conditions; in the warm, Mediterranean climate of some areas of southern Italy, Sicily and Greece; and in Italy's cooler regions of Trentino and Emilia-Romagna, winegrowers often use pergola training, where vines are tied to an overhead structure.

## Propagation

- Generic clones available from commercial nurseries have been bred for maximum production rather than distinct character and are not specific to any region or area, unlike indigenous grapes.
- Many winegrowers see great value in maintaining the genetic identity of their oldest vines, which have adapted to vineyards over centuries and produce low yields of small, concentrated berries.



- Common practices by winegrowers to propagate their best vines include Selection Massale, where cuttings taken from a number of the best old vines are used to plant new vines, and clonal selection, where a cutting from a single vine is used for replanting. In both cases, winemakers identify “mother vines” with superior quality attributes (low yields, small berries, resistance to disease, etc.) to be replicated in new vines.

## Irrigation

- Three types of irrigation systems are used for vineyards: drip, sprinkler and flood. Drip and sprinkler systems provide precise watering; a flood system is less accurate.
- Drip irrigation, also called trickle irrigation, employs long, plastic supply lines that are placed along each row, one dripper per vine.
- Sprinkler irrigation, similar to crop-watering systems, utilizes a network of heads about 20 meters (65 ft.) apart which water several rows of vines.

- Flood irrigation is an ancient method still used in desert areas to make bulk wines. Water from a supply canal is diverted to vine rows, where it’s absorbed by the soil. Furrow irrigation used in Argentina is similar but provides greater control.



- Most Old World wine regions don’t allow irrigation, which is often permitted in New World regions.

## Canopy Management

- Regardless of vine training methods used, canopy management is crucial to the final quality of the grapes. An optimal ratio of leaves to bunches is maintained so the vine’s vigor isn’t wasted on superfluous vegetation.
- In the summer, excessive shoots are trimmed or thinned to ensure an ideal number of bunches per vine and for proper bunch spacing, and leaf pulling is performed early in the season to reduce unwanted vegetation.



- In addition to canopy management, many winegrowers do a “green harvest” to improve the wine quality and encourage ripening. In mid- to late summer, some bunches are removed from the vine. The remaining bunches ripen more quickly with an improved leaf-to-fruit ratio.

## Harvest

- Although slow and labor intensive, handpicking minimizes damage and allows for more stringent selection of grape bunches.
- Machine harvesting is costly but is faster and can be done at night in cool temperatures. The latest machines are sophisticated, able to gently harvest without damaging grapes and also allow a selection in the vineyard.



- Many winegrowers and/or winemakers feel that the decision of when to pick is one of the two most important during the year; the other is what temperature to ferment at. Alcohol and acidity are measured and the grapes are tasted to give the winemaker a sense of ripeness and the quality of tannins. In many great wine regions, there is a constant risk of hail, frost and rain which can damage or destroy the harvest.



# TERROIR

## What is Terroir?

- The concept of terroir comes from the French expression *goût de terroir* ("taste of the earth") which asserts that every great vineyard's distinct identity and sense of place is expressed in the aroma and flavor characteristics of its wines.
- Terroir is a vineyard's unique combination of soil, topography, climate and microclimate: all physical and environmental factors that affect the vine.
- "Non-interventionist" or "natural" winemakers feel that terroir can be superseded by winemaking techniques and insist on doing as little as possible in the winery to affect the character of the vineyard, the grapes and the wine.
- Terroir is a traditional "Old World" concept that has spread to "New World" regions like California, Argentina and New Zealand.
- Many winemakers feel a necessary component of great terroir is observation over time.
- Old World winemakers have cultivated from terroir in France, Italy and Spain for centuries; New World winemakers have comparatively just started but are learning fast.
- Burgundies are the best example of wines that express specific vineyard terroir. Burgundy's appellation system is a quality hierarchy based strictly on the location of vineyard terroir. See diagram below.

## Soil

- A vineyard with poor, shallow topsoil with good drainage is ideal.



- Vines should be forced to grow a deep and extensive root system that reaches down to mineral-rich subsoil.
- Richer soils yield a greater quantity of grapes at the expense of quality.

## Topography

- Topography refers to the physical features and geography of an area's surface: altitude, slope, sun exposure and proximity to water.



- Topography affects climate conditions; grapes planted on south-facing slopes in the northern hemisphere (the reverse for southern hemisphere) have greater warmth and sun exposure. Grapes planted close to water enjoy more humidity and moderated temperatures.

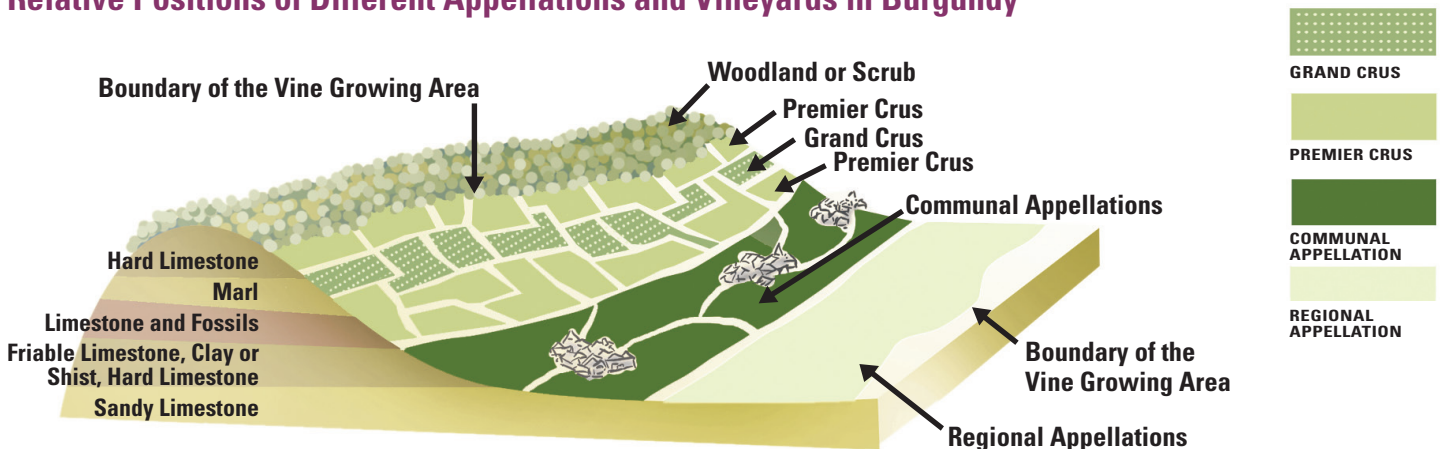
## Climate and Microclimate

- All wine is grown between 30–50° latitude north and south of the equator.
- Optimal conditions: minimal frosts in the winter, mild spring, hot sunny summer, long dry autumn. Climate conditions during the growing season can greatly affect the quality of the vintage.



- Many of the world's finest wine regions are situated at the limits of cultivation (Champagne, Burgundy, Rioja Alta and Piedmont) where cool, wet climate conditions enhance acidity levels but often bring frost and hail.
- Training systems, row spacing and canopy trimming can impact a vineyard's microclimate by affecting the vine's exposure to sun.

## Relative Positions of Different Appellations and Vineyards in Burgundy



# A YEAR IN THE LIFE OF A VINE



## WINTER

The dormant vines are completely without leaves. Cuttings are taken for indoor grafting onto rootstocks to be planted as new vines in the spring a year later. The vines awaken and sap begins to rise. At the end of winter, budbreak begins.



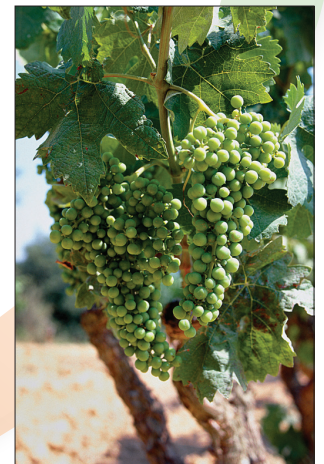
## SPRING

New shoots emerge from the vine, and there follows a period of rapid growth during which frost is a serious concern. Year-old nursery cuttings are planted. Near the end of spring, the vines begin to flower (*floraison*) which completes within 10 days. Fruit set is the delicate stage after flowering, when the flower transitions to grape. This critical period is a major determinant of the crop size and quality. Normally, harvest takes place around 100 days after flowering.



## SUMMER

Berries grow and change color; warm, sunny weather is desirable. At the end of summer, grape sugar levels and color increase as acidity levels drop. Early-ripening varieties (e.g. Merlot, Gamay, and Tempranillo) are picked.



## AUTUMN

Harvesting continues with later-ripening varieties (e.g. Pinot Noir, Cabernet Sauvignon). The harvest is usually complete by mid-October. The sap recedes and the vine becomes dormant. At the end of autumn, winter pruning begins in some regions.