The Plant's environment, the vine and the grape

The type of grape determines largely the flavor, color, sugar, acidity and the levels of tannin in the wine. Other conditions, namely **climate**, **weather**, **sunlight**, **water**, **warmth** and **nutrients** also affect the taste of the wine.

Hot climate brings more alcohol, a fuller body, more tannin and less acidity while cool climate brings less alcohol, lighter body, less tannin, and more acidity.
Monitoring Environmental parameters: Smart Agriculture

- Monitoring of soil parameters, weather conditions and plant growth
- Application to any kind of crop (vineyards, greenhouses, fruit trees, tobacco, corn, etc.)
- Allow increase quality and quantity of production, optimize fertilization, reduce water consumption, predict insect plagues, etc.
Monitoring Environmental parameters
Weather conditions: TEMPERATURE

During its growth cycle, the vine needs an average temperature of 16 to 22°C to undergo photosynthesis. In addition, different varieties need different amounts of heat to reach optimal ripeness.
In the wine world, the temperature scale is categorized as follows:

- Cool
- Mild
- Warm
- Hot

Fully ripen, grapes need a sufficient amount of heat during the growing season. At the same time, winter temperatures must be cold enough to encourage the vine to go dormant.
Monitoring Environmental parameters
Weather conditions: HUMIDITY

Humidity (and mild temperatures) can cause the appearance of diseases such as mold, botrytis and mildew. Large exposure of Humidity with a lack of Sun can affect the growth of the grapes, roting them and becoming them unusable.
Monitoring Environmental parameters
Weather conditions: SUNLIGHT - PAR RADIATION

The amount of light absorbed by the plant determines the rate of photosynthesis:

- Without light there is no photosynthesis, and the plant dies
- The more light there is the more glucose the plant produces
- Excessive sunlight exposure causes burned grapes resulting in a bitter flavor
Monitoring Environmental parameters
Weather conditions: THE WIND

- Wind moderates warm and cool temperatures in the vineyards, which can affect the maturation process of grapes.

- Wind can help prevent humidity, mildew and other mold.

- Wind can also help reduce humidity and warm the vines during spring frosts, avoiding frost damages to flowers, fruit and leaves. In some places the install wind machines for this purposes.
Precipitation amounts DO NEED to be monitored in order to determine if irrigation is necessary.

- Excess amounts can cause quality issues, diseases, fruit rot... and prior to the harvest can affect Brix by diluting the sugar content and decreasing production of alcohol during fermentation.

- Vines that experience water stress produce fewer grapes, but with higher quality.

- Extreme water deficit is harmful to the development of the fruit.
The manipulation of moisture availability is important in ensuring the right berry size and the desired concentrations of sugar.

Drip micro irrigation is the most suitable method for the vineyard, however how to irrigate will depend on the type of soil and the moisture content:

- well-drained soils
- Heavy clay soils

Two critical points for watering in the vine:

- Flowering
- Following veraison
Monitoring Soil conditions
The importance of Soil temperature in vineyards:

- Temperature fluctuations in soil affect the growth of roots and also affects both passive and active water absorption.

- The absorption of water will also affect the absorption of Nutrients

Soil temperature sensor

Watermark sensor
Case study

Smart Vineyards: Switzerland with PreDiVine
Predicting Diseases of Vine
Smart Wine: Switzerland with PreDiVine
Predicting Diseases of Vine

PreDiVine
Predicting Diseases of Vine

Pest Management System
Treatment Optimization
Production Cost Reduction

This stage has been reached on June 3
Smart Wine: Switzerland with PreDiVine
Predicting Diseases of Vine

ROI:
- Vineyard disease control for three threats:
  - The North American leafhopper insect.
  - Plasmopara viticola (Downy Mildew).
  - Oidium (Powdery Mildew).
Smart Wine: Switzerland with PreDiVine
Predicting Diseases of Vine

Deployment:
Case study

Smart Vineyards: Waspmote Plug & Sense! in Slovenia with Elmitel eVineyard
Smart Wine: Waspmote Plug & Sense! in Slovenia with Elmitel eVineyard

- Manage costs
- Manage work smarter
- Treat with confidence.
- Irrigate for Quality
- Create documentation
- Track your fleet

www.evineyardapp.com
www.evineyardapp.com/#register
matic@evineyardapp.com

www.evineyardapp.com
Smart Wine: Waspmote Plug & Sense! in Slovenia with Elmitel eVineyard

ROI:
• Savings of not only time and money, but also savings related to the environment.
• Alerts farmers and vintners in case of dry soil and other conditions that may require attention or human intervention.
• 20-30 percent less spraying.
Deployment:
Case study

The first Smart Vineyard in Lebanon chooses Libelium’s technology to face the climate change.
The first Smart Vineyard in Lebanon chooses Libelium’s technology to face the climate change

- **Challenge:** Agriculture sensor network in vineyards to compile soil and climate information and their effect in the grapes.
- **Client:** Libatel.
- **Place:** Château Kefraya vineyards, Beqaa Valley, Lebanon.
- **Sector:** Smart Agriculture.
The first Smart Vineyard in Lebanon chooses Libelium’s technology to face the climate change

**ROI:**

- Increasing productivity and efficiency of the crops
- Improving customer service quality and adaptability to external elements

Cloud partner: Actility Thingpark

Communication protocol: LoRaWAN

3G
The first Smart Vineyard in Lebanon chooses Libelium’s technology to face the climate change

Deployment:
Case study

Smart Wine: Libelium's IoT technology allows predictive control of vineyards in the Pago Aylés winery, Spain
Challenge: IoT technology applied to precision agriculture, improving productivity, saving costs and increasing predictive capacity in determining strain behaviour during the grape ripening process.

Client: remOT Technologies.

Place: Aylés, Spain.

Sector: Smart Agriculture.

Smart Wine: Libelium's IoT technology allows predictive control of vineyards in the Pago Aylés winery, Spain
Smart Wine: Libelium's IoT technology allows predictive control of vineyards in the Pago Aylés winery, Spain

ROI:

- Knowledge about the production which enables to maintain the final quality of the product.

- The improvement of knowledge-based management gives greater room for manoeuvre in making decisions that minimize risk and reduce maintenance costs.
Smart Wine: Libelium's IoT technology allows predictive control of vineyards in the Pago Aylés winery, Spain

Deployment: