



Co-funded by
the European Union

WINOVATE

Non-Alcoholic Wine as a vehicle of Innovation
and Value for Agri-food Training and Education

ERASMUS+ / 2023-1-HU01-KA210-VET-000151814

MICRO MOOCS

3rd MICRO MOOC

Use of Digital Tools and
Technologies in Precision
Agriculture for Non-Alcoholic
Wine Production





Introduction to Precision Agriculture

- **Definition and principles of sustainable agriculture.**

Sustainable agriculture is an approach to farming that focuses on producing food while preserving the environment, supporting fair labor practices, and ensuring economic viability. Its principles include minimizing chemical inputs, promoting biodiversity, conserving water, and enhancing soil health to maintain long-term productivity.

- **Benefits of precision agriculture in viticulture.**

Precision agriculture in viticulture provides numerous benefits, including improved yield and quality of grapes, efficient use of resources such as water and fertilizers, and reduced environmental impact. By utilizing advanced technologies, growers can make data-driven decisions that enhance vineyard management and sustainability.

- **Overview of precision agriculture tools used in Greece**

In Greece, vineyards are increasingly adopting precision agriculture tools such as soil moisture sensors, weather stations, and drones for monitoring vine health and growth conditions. These tools enable Greek vintners to optimize irrigation, apply targeted treatments, and gather detailed data to improve overall vineyard efficiency and sustainability.

- **Interactive Element:**

Precision agriculture primer

<https://www.everycrsreport.com/reports/RS20515.html>





Co-funded by
the European Union

Digital Mapping and Geographic Information Systems (GIS)

- **Role of GIS in vineyard management.**

Geographic Information Systems (GIS) play a crucial role in vineyard management by providing detailed spatial data that helps in mapping vineyard topography, soil types, and microclimates. This information aids in making informed decisions about planting, irrigation, and pest management, leading to more efficient and sustainable vineyard operations.

- **How digital mapping aids in precision agriculture.**

Digital mapping aids precision agriculture by offering real-time, high-resolution data on field conditions, which helps farmers optimize planting, irrigation, and fertilization practices. By visualizing data layers such as soil health, crop health, and moisture levels, digital maps enable precise management of resources, improving crop yield and reducing environmental impact.

- **Examples of GIS use in Greek vineyards.**

In Greek vineyards, GIS is used to analyze soil properties and landscape features, helping vintners select the best sites for planting different grape varieties. Additionally, GIS data supports the management of irrigation systems and disease monitoring, enhancing the overall efficiency and sustainability of vineyard practices in Greece.

- **Interactive Element:**

Interactive map showing GIS applications.

https://www.us-ltrcd.org/files/17f7c6203/Intro-to-GIS-GPS-and-GIS-for-vineyards_Kelly-Bobbitt.pdf





Use of Sensors in Vineyards

- **Types of sensors used in viticulture (e.g., soil moisture sensors, weather stations).**

Viticulture employs various types of sensors such as soil moisture sensors, weather stations, and canopy temperature sensors to monitor environmental and plant conditions. These sensors provide crucial data on soil moisture levels, weather conditions, and plant health, enabling precise vineyard management.

- **Benefits of real-time data collection.**

Real-time data collection allows for immediate analysis and response to changing vineyard conditions, ensuring timely interventions to optimize vine health and productivity. This approach enhances decision-making accuracy, reduces resource wastage, and improves overall vineyard efficiency and sustainability.

- **Case study of sensor technology in a Greek vineyard.**

A Greek vineyard implemented advanced sensor technology, including soil moisture sensors and weather stations, to enhance vineyard management. This technology enabled the vineyard to optimize irrigation schedules and predict disease outbreaks, resulting in a 20% increase in grape yield and significant water savings.

- **Interactive Element:**

Hypertext links to sensor technology suppliers in Greece.

<https://draxis.gr/project/green-vineyard/>





Drones and Unmanned Aerial Vehicles (UAVs)

- **Applications of drones in vineyard monitoring.**

Drones in vineyard monitoring are used to capture high-resolution aerial images and collect data on vine health, growth patterns, and pest infestations. They provide a comprehensive view of the vineyard, allowing for precise assessment and management of vineyard conditions.

- **Benefits of aerial imagery and data analysis.**

Aerial imagery and data analysis enable vineyard managers to detect issues such as nutrient deficiencies, water stress, and disease outbreaks early, allowing for targeted interventions. This technology enhances decision-making, optimizes resource use, and improves overall vineyard productivity and sustainability.

- **Examples of drone use in Greek vineyards.**

In Greek vineyards, drones are employed to monitor vine vigor, assess crop health, and map vineyard topography for better water management. These applications have led to more efficient vineyard practices, reduced labor costs, and improved grape quality and yield.

- **Interactive Element:**

Video demonstrating drone usage in Greek vineyards.

<https://www.youtube.com/watch?v=iqTJ-gDvyQw>





Data Analysis and Management

- **Importance of data analysis in precision agriculture.**

Data analysis in precision agriculture is crucial for transforming raw data into actionable insights, allowing farmers to make informed decisions that optimize crop management. By analyzing data on soil conditions, weather patterns, and crop health, farmers can enhance productivity, reduce input costs, and minimize environmental impact.

- **Tools and software for managing vineyard data.**

Tools and software for managing vineyard data include platforms like GIS mapping systems, soil moisture monitoring apps, and vineyard management software such as VineView and AgriXP. These technologies help vineyard managers collect, analyze, and visualize data, facilitating precise and efficient vineyard operations.

- **Insights from Greek vineyards using data management tools.**

Greek vineyards using data management tools have reported significant improvements in irrigation efficiency, disease management, and overall grape quality. By integrating data analytics into their operations, these vineyards have enhanced decision-making processes and achieved better sustainability and productivity outcomes.

- **Interactive Element:**

Graphs showing data analysis outcomes.

<https://www.statistics.gr/documents/20181/98adf594-84ad-25ce-0f80-dac350b668b3>

