Proposed RFID implemtation in Vigne Mastrodomenico

1) Wireless Sensor Network for the outdoor and weather monitoring

A wireless sensor network composed by a wireless weather station, a wireless node for the vineyard soil and grapevine monitoring and a consol for the sensor data collection, have been selected.

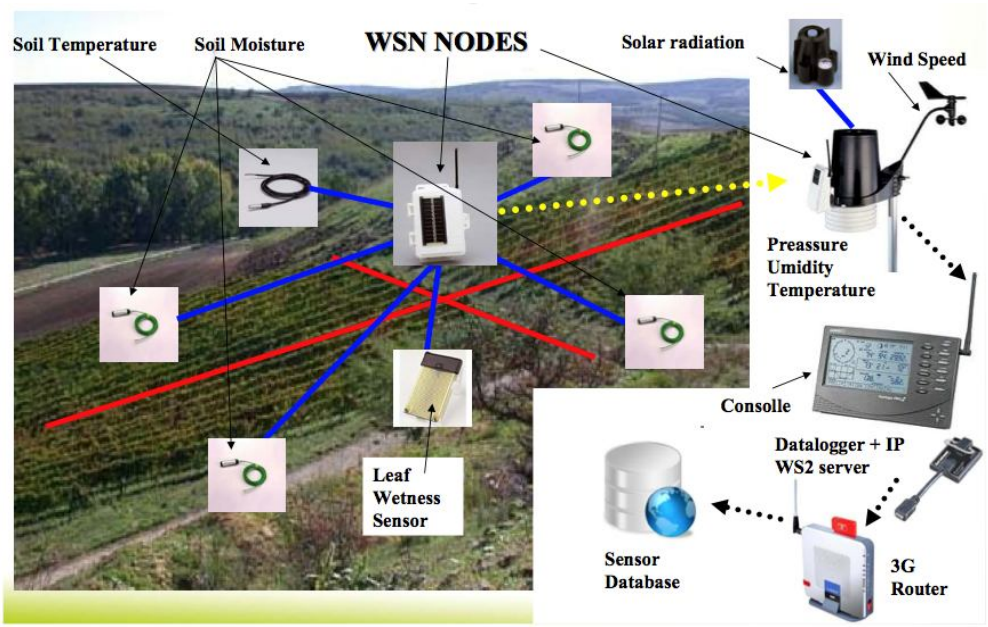
The **weather station** is equipped with:

- wind speed and direction sensors;
- outdoor temperature sensors;
- relative humidity sensor;
- solar radiation sensors;
- rain precipitation sensor.

The **soil and grapevine wireless node** is equipped with:

- soil moisture sensors;
- soil temperature sensors;
- leaf wetness sensors.

Among the other available, the weather station Davis Vantage PRO 2 Wireless has been selected because it satisfies the requirements of IP connectivity constraint, modular structure and accuracy. Moreover, a Davis Consol has been chosen because it allows the gathering of data coming from both the weather station and the soil/foliage parameter sensors.



2) UHF RFID

- PDA equipped with a UHF RFID Reader module;
- Fixed UHF RFID Reader (as a backup choice),
- UHF RFID Tag printer.

UHF RFID band has been chosen because it guarantees the best trade-off between cost and read range. In addition, UHF RFID tags are EPC global compliant.

3) Wireless and Internet technology

The following technologies supporting the internet and wireless connectivity have been identified:

- Routers supporting UMTS, EDGE and GPRS communication standards and the IEEE 802.11 protocol;
- IP Data-Logger.

In this way, once the vineyard will be provided with an Internet connection, WSN nodes will communicate with the console of the WSN and sensor data will be accessible remotely. The choice of an IP data logger (compatible with the allows you to avoid the use of a PC in a hostile environment in terms of moisture, tempering and accessibility (in case you need to reboot)

4) Databases and web services

Specific software solutions for data gathering, management and forwarding are needed. For instance, databases to store sensor data and web services to allow user operations.