



www.liendelavigne.org

JOURNÉES ANNUELLES LIEN DE LA VIGNE

VINELINK ANNUAL DAYS

PROGRAMME 2018

**P prédiction, Détection et Prévention des
Risques en Viticulture : Maladies,
Ravageurs et Climat**

*Predicting, Detecting and Preventing
grapevine risks: Diseases, pests and climate*

Tools under development in Italy

Outil en développement en Italie

ilaria.pertot@unitn.it



Decision support systems

- can **simplify** complex **agronomic decisions** and / or the management of **cellar processes**
- from complex software to **user-friendly apps** on **mobile phone or tablets**
- **cheap internet connections and hardware**
- **good network coverage**

NEW OPPORTUNITIES ALSO IN AGRICULTURE

DSS in agriculture: IPM

- Several disease forecasting models
- Objective: to reduce the number of treatments (mainly targeting downy mildew)
- Estimating the risk of downy mildew infection (mainly identification of infection time)
- Limited uptake by the market

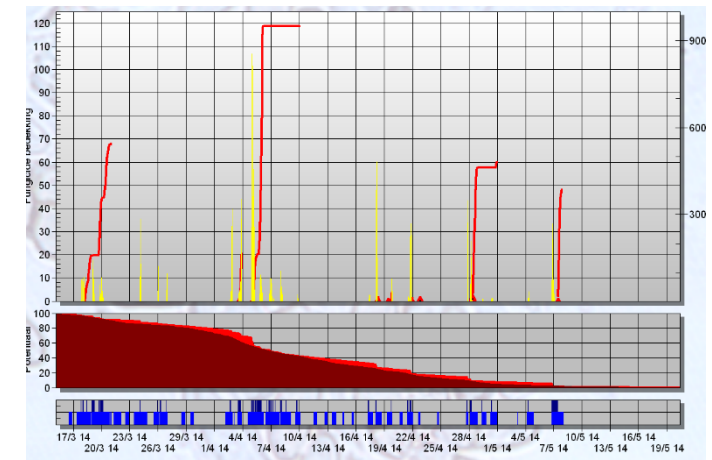
DO WE KNOW ALL THE REASONS?

Limiting factors

DSS often do not:

- cover all pests and pathogens
- always consider the susceptibility of the plant
- consider the microclimate (in weather forecast)
- consider the persistency of the last treatment
- merge treatments (more than one pest/pathogen)
- select the best active ingredient in term of efficacy and resistance risk
- calculate 'time to harvest'

Growers' needs

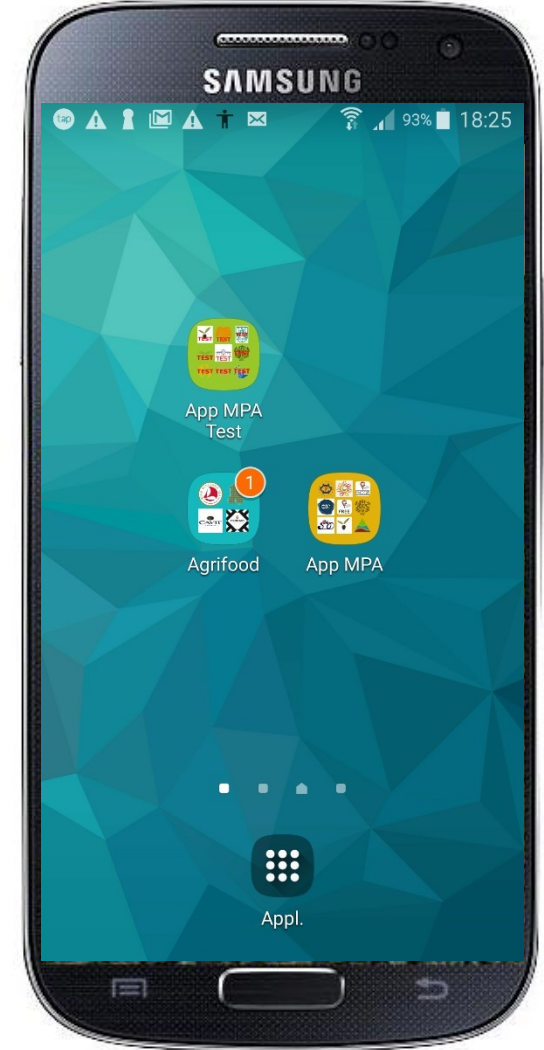


Growers need:

- recommendation rather than 'pictures' or scenarios
- keep record of the treatments done
- calculation of quantities and volumes of spray
- to combine treatments against two or more pests
- short term recommendation and medium term risk assessment
- flexibility (decisions, active ingredients, dosages, etc.)

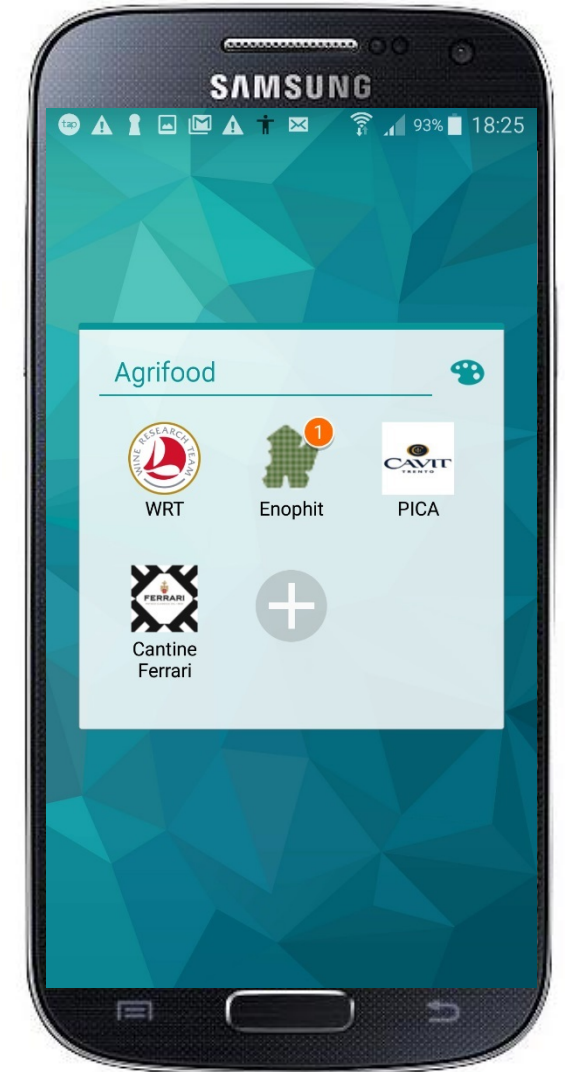
User-friendly and apps

- user friendly interface
- app (to insert data and receive the recommendation) on mobile devices
- alerts or notifications
- frequent update based on short term weather forecast (flexibility operations)



Management and inputs

- management of all pathogens and parasites of the crop
- DB of all vineyards
- link to agronomic practices and cellar management
- Inputs from growers must be minimized
- automatisms to determine the phenological stage, dosages, volumes, microclimate, etc.
- customization



Records and archive

- Cadaster (all vineyards, size, variety, age, etc.)
- Geo-localization
- Pictures
- Records of monitoring
- Records of treatments (date, dosage, volume)
- Retrieve function

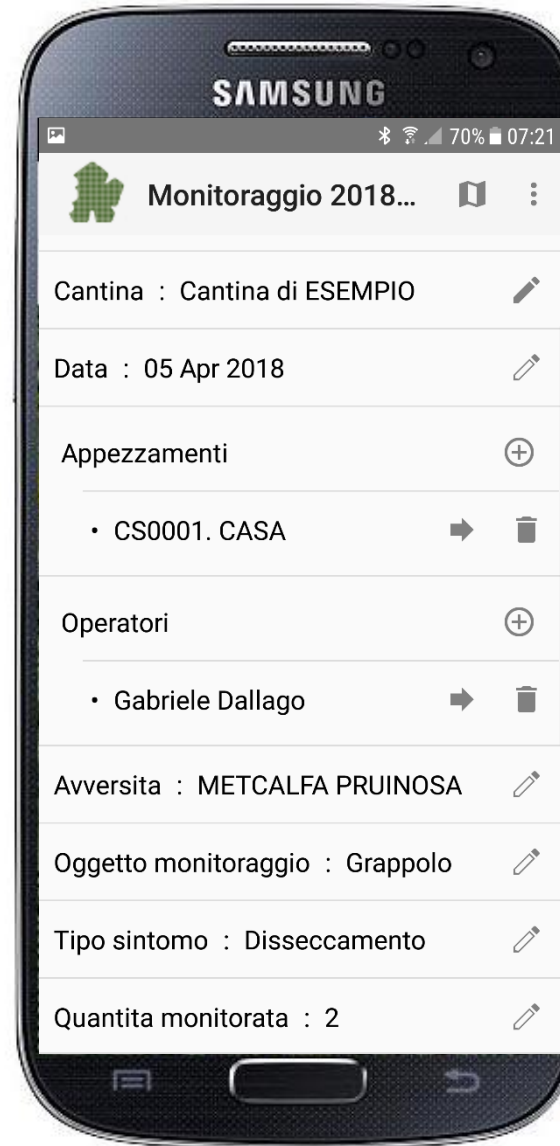


Record and retrieve

Assessment of disease/ pest

- automatic date, location, operator
- input (fix: scroll down menu; free)

Retrieve data (single
data/aggregated data)

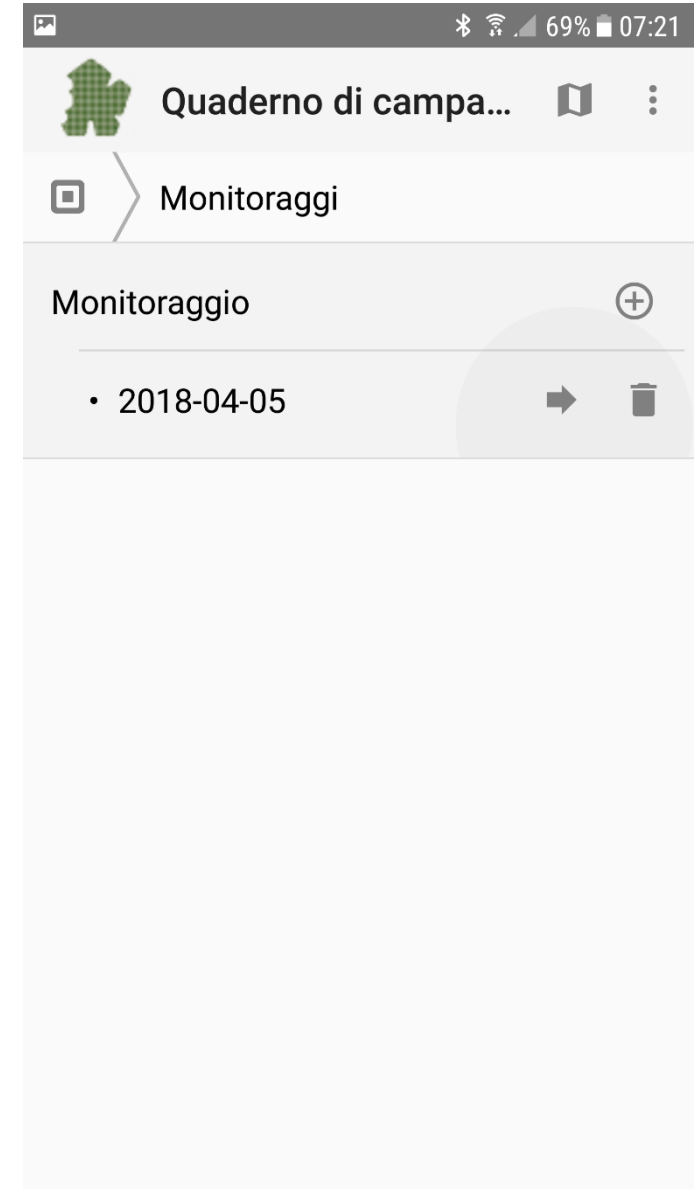
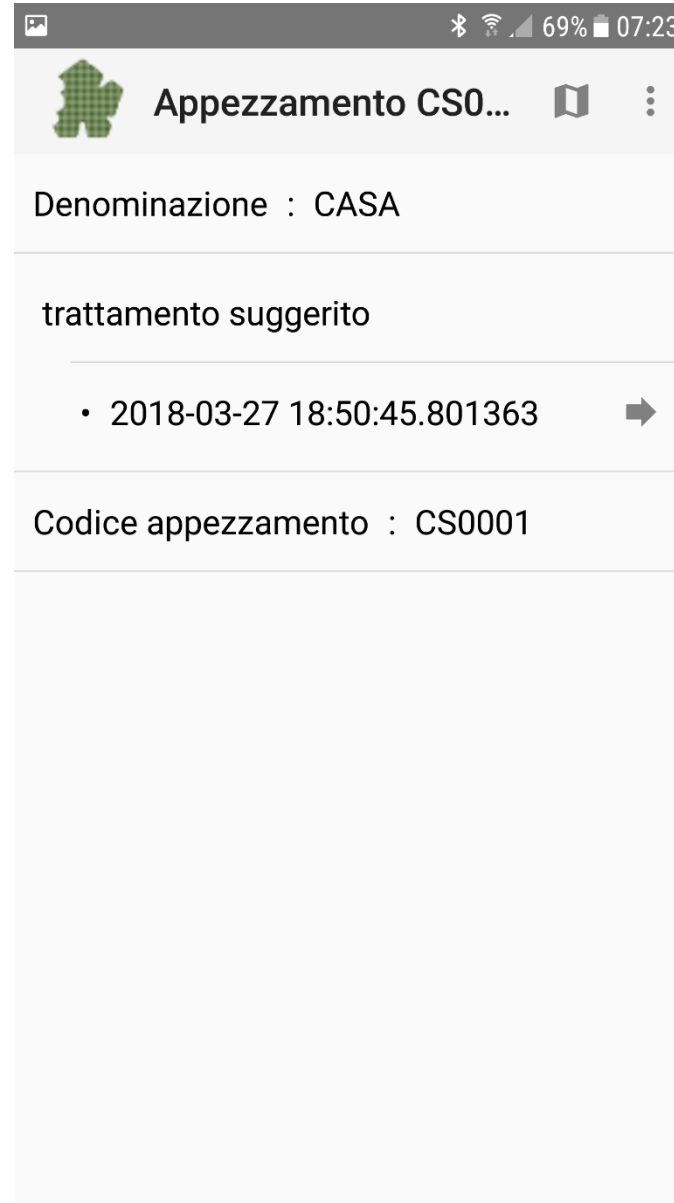


Recommendation

Customized (variety,
phenological stage, risk, etc.)

- automatic date, location, operator
- Limited input from growers (i.e. monitoring disease presence)
- based on decision algorithm

Accepted or not by the grower



Laptop interface: intuitive... in few clicks...

The screenshot shows a web browser window with the URL `enophit.vinideltrentino.com/qdc`. The interface is designed for managing agricultural data for the year 2018. At the top, a status bar indicates "Questo QDC non è mai stato pubblicato Adesso il quaderno è aperto" (This QDC has never been published. The notebook is now open) and shows "Conformità verificate" (Compliance verified). A dropdown menu for "Azienda agricola:" (Agricultural company) is set to "Azienda Agricola Esempio 1".

The main content area features a horizontal row of six colored buttons, each with an icon and a link to a list:

- Trattamenti** (Treatments) - Purple button with a flask icon.
- Lavorazioni** (Cultivations) - Blue button with a leaf icon.
- Concimazioni** (Fertilizations) - Green button with a syringe icon.
- Monitoraggio** (Monitoring) - Orange button with a person icon.
- Formazione** (Training) - Yellow button with a calendar icon.
- Apporto idrico** (Water supply) - Purple button with a water drop icon.

Below this row, a section titled "Quaderno di campagna 2018" (2018 campaign notebook) displays the name "Azienda agricola Azienda Agricola Esempio 1" and two tax codes: "Codice Fiscale(1251452451)" and "P.IVA(1251452451)". A large red arrow points from the bottom right towards the company name.

A left sidebar contains a navigation menu with various options, some marked with red or green circles indicating counts or status:

- Prima pagina QDC
- Azienda agricola
- Dichiarazioni
- Certificati aziendali
- Operatori (1)
- Appezamenti (1)
- Attrezzatura usata (1)
- Magazzino prodotti
- Rifiuto speciale
- Trattamenti (2)
- Lavorazioni
- Concimazioni
- Monitoraggi (1)
- Formazione
- Apporti idrici
- Stampa
- Stampa Anno precedente
- Utenti

At the bottom of the interface, there are three blue buttons:

- Concludi il quaderno a fine stagione
- Pubblica il quaderno
- Continua la compilazione

Intuitive... in few clicks...

enophit.vinideltrentino.com/qdc

Q.D.C. 2018 Questo QDC non è mai stato pubblicato Adesso il quaderno è aperto Conformità verificate Azienda agricola: Azienda Agricola Esempio 1

Prima pagina QDC
Azienda agricola
Dichiarazioni
Certificati aziendali
Operatori
Appezamenti
Attrezzatura usata
Magazzino prodotti
Rifiuto speciale
Trattamenti
Lavorazioni
Concimazioni
Monitoraggi
Formazione
Apporti idrici
Stampa
Stampa Anno precedente
Utenti

1
1
1
2
1

Trattamenti
Lavorazioni
Concimazioni
Monitoraggio
Formazione
Apporto idrico

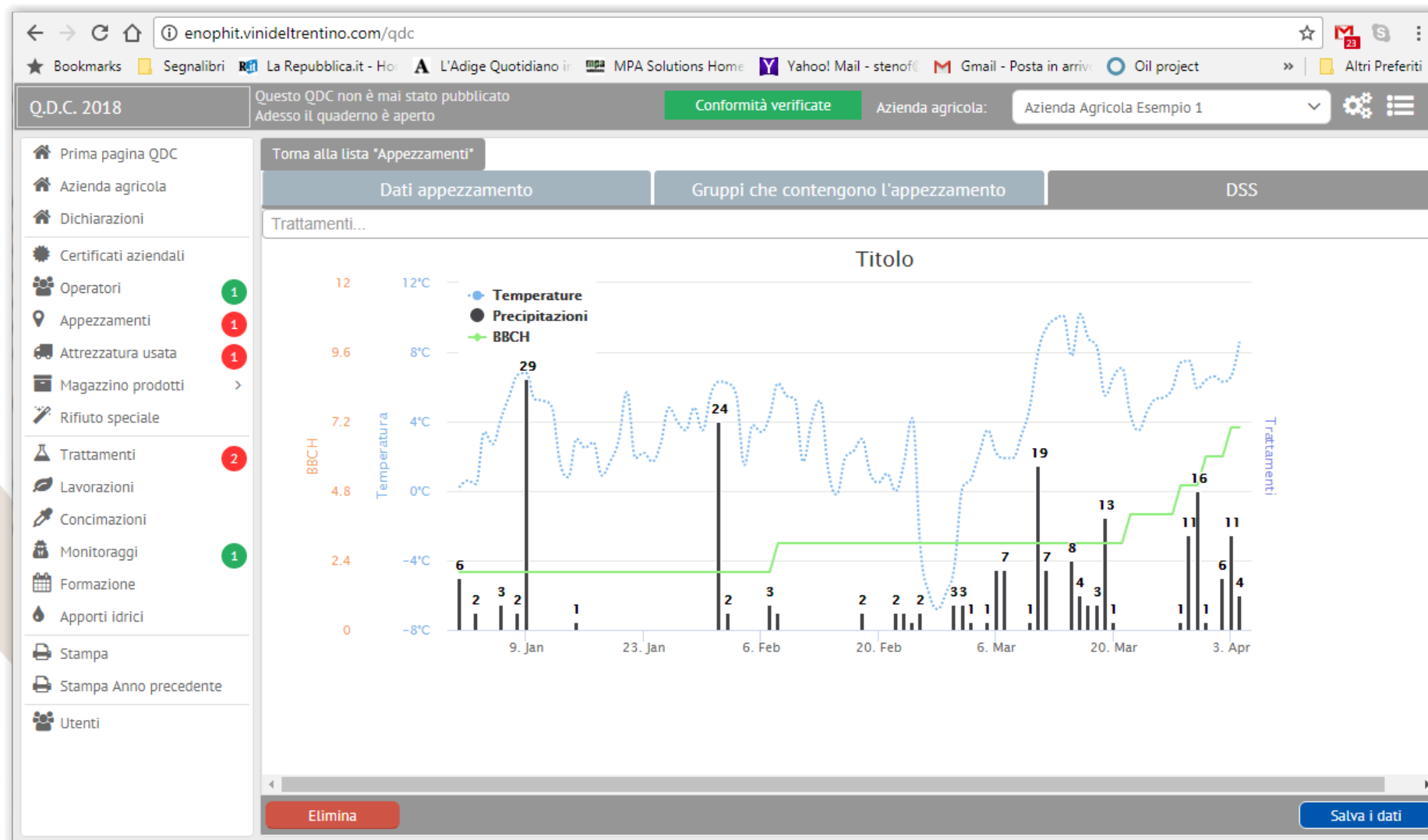
Vai alla lista »

Data	Appezamenti	Avversità	Note	Tipo trattamento	Conformità		Prodotti disponibili		
					Agrofarmaci	Principi			
02/02/2018	CS0001. CASA	MARCIUME NERO		Trattamenti e fitoregolatori	✗	✗	✓		
27/03/2018	CS0001. CASA	PERONOSPORA		Trattamenti e fitoregolatori	✗	✓	✓		

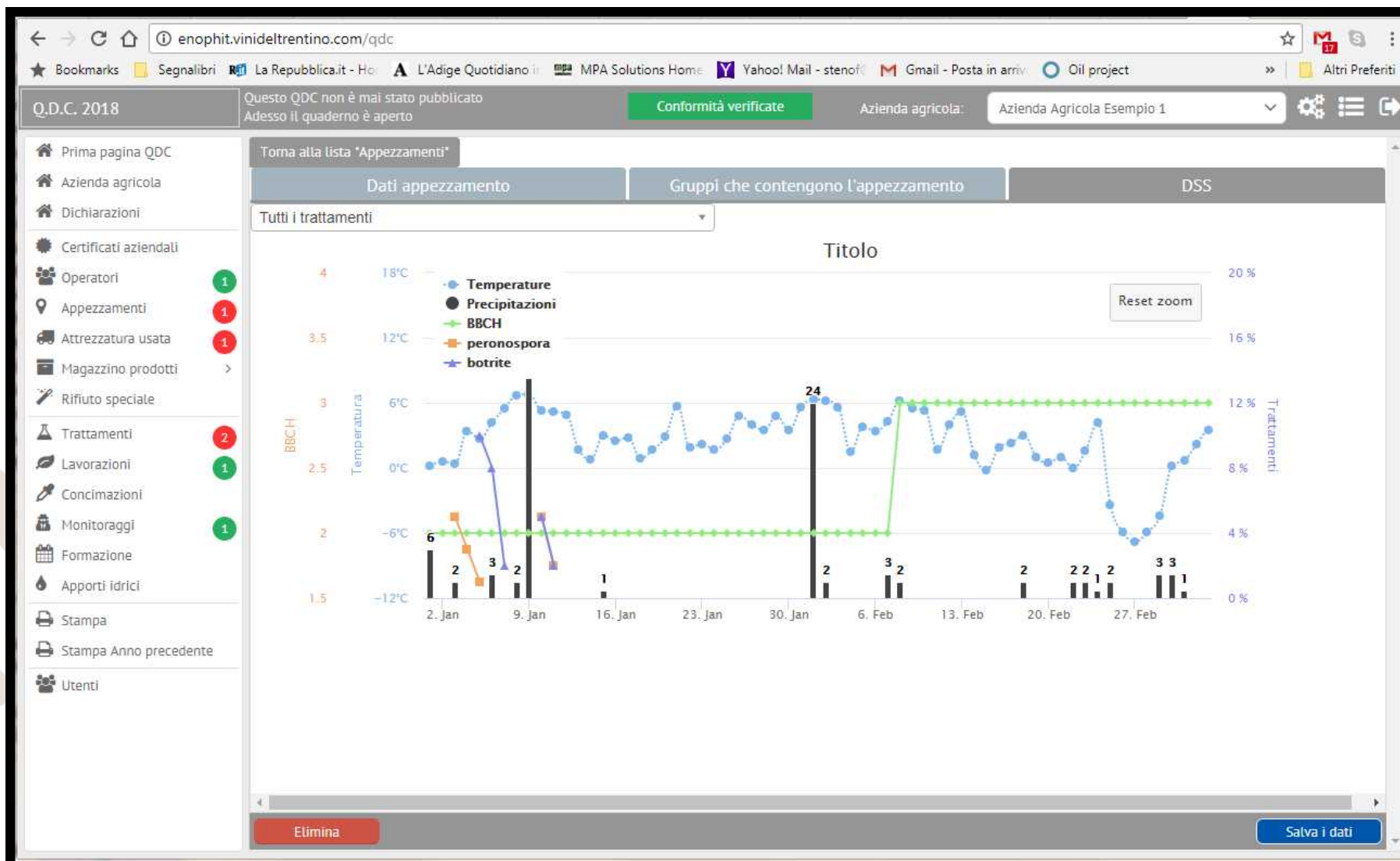
Aggiungi nuovo

Prosegui inserendo le lavorazioni


Weather and phenology (BBCH)

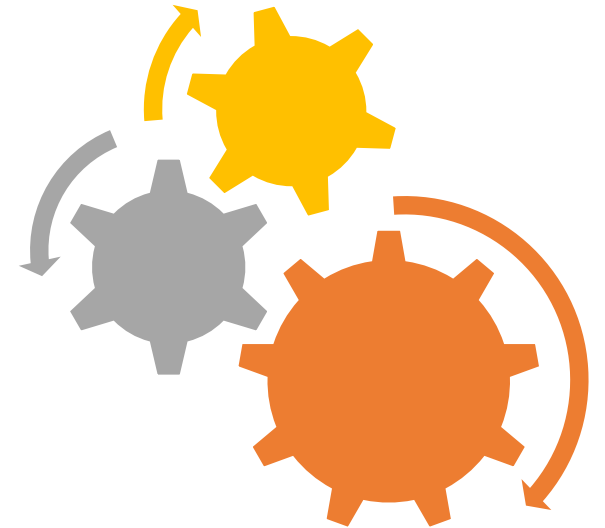


Disease risk in relation to persistence of treatments



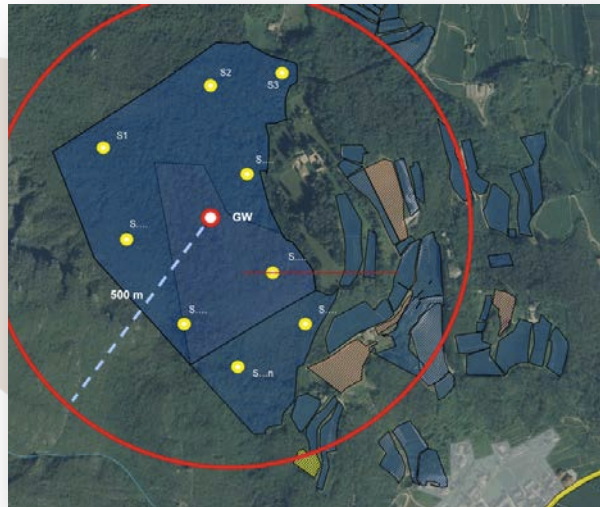
Decision flowcharts: complex reasoning made simple

- 
- Last treatment done
 - Persistence of the active substance(s) used (plant growth, rain, temperature)(past weather)
 - Risk of infection/exceeding the population threshold (calculated by disease/pest forecasting models or assessed by the farmer) (environmental parameters)
 - Susceptibility of the plant (phenological stage)
 - (temperature)
 - Future weather (weather forecast)
 - Recommendation: accept/reject
 - the recommendation or modify it



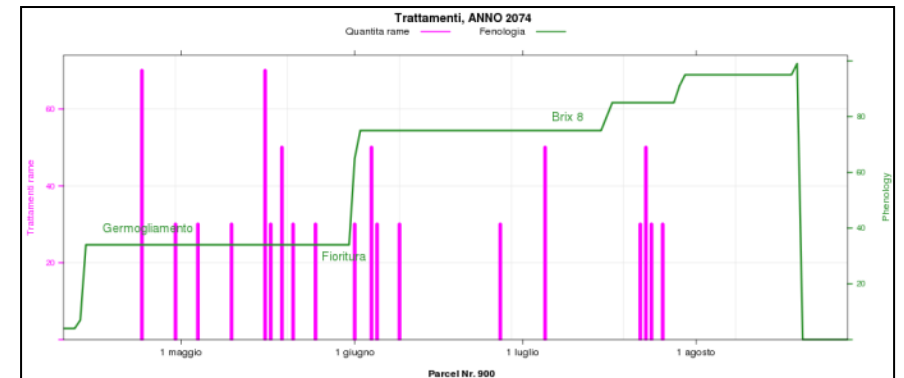
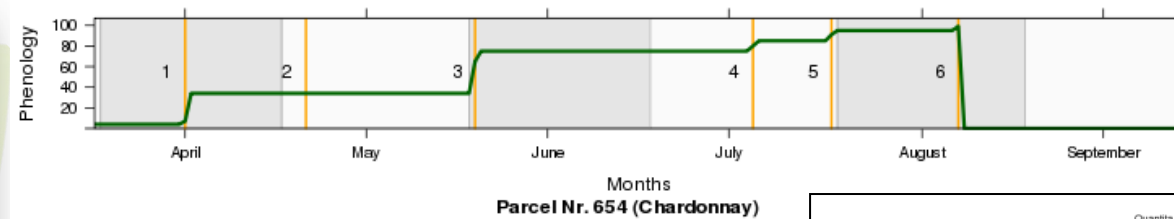
Critical issues

- Quality of weather forecasts
- Quality of microclimate downscaling (vineyard resolution)
- Self-correction of the model (phenology, disease, pest, etc.)



Vitis vinifera Phenology MAIN PHASES - 2021/50 Calda

1. Germogliamento
2. Dieci cm.
3. Fioritura
4. Brix 8
5. Invasiatura
6. Raccolta





Thank you for your attention!

Question time