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Dr. Elena BRUNORI, Prof. Mauro MAESANO.

Dipartimento per la Innovazione nei sistemi biologici,
agroalimentari e forestali (DIBAF) – Università degli Studi della
Tuscia (VITERBO)

LIFE WINEgROVER

Precision Agriculture System to limit the impact on the
environment, on health and on air quality of grape production

METTIAMOCI IN RIGA



LIFE WINEgROVER : Ambiente e Viticoltura



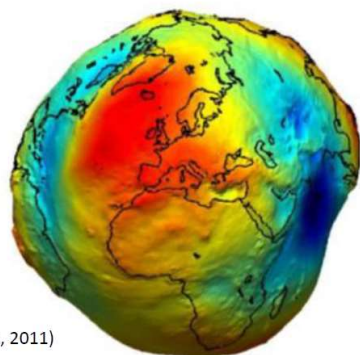
Emergenze ambientali



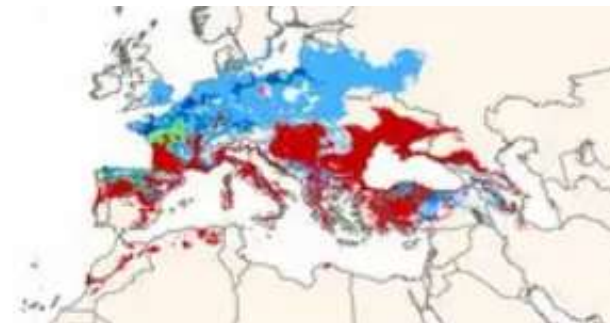
Perdita vocazionalità



Adattamento e Mitigazione



(ESA, 2011)



Hannah et al. 2013

Nuove tecniche

Nuovi strumenti

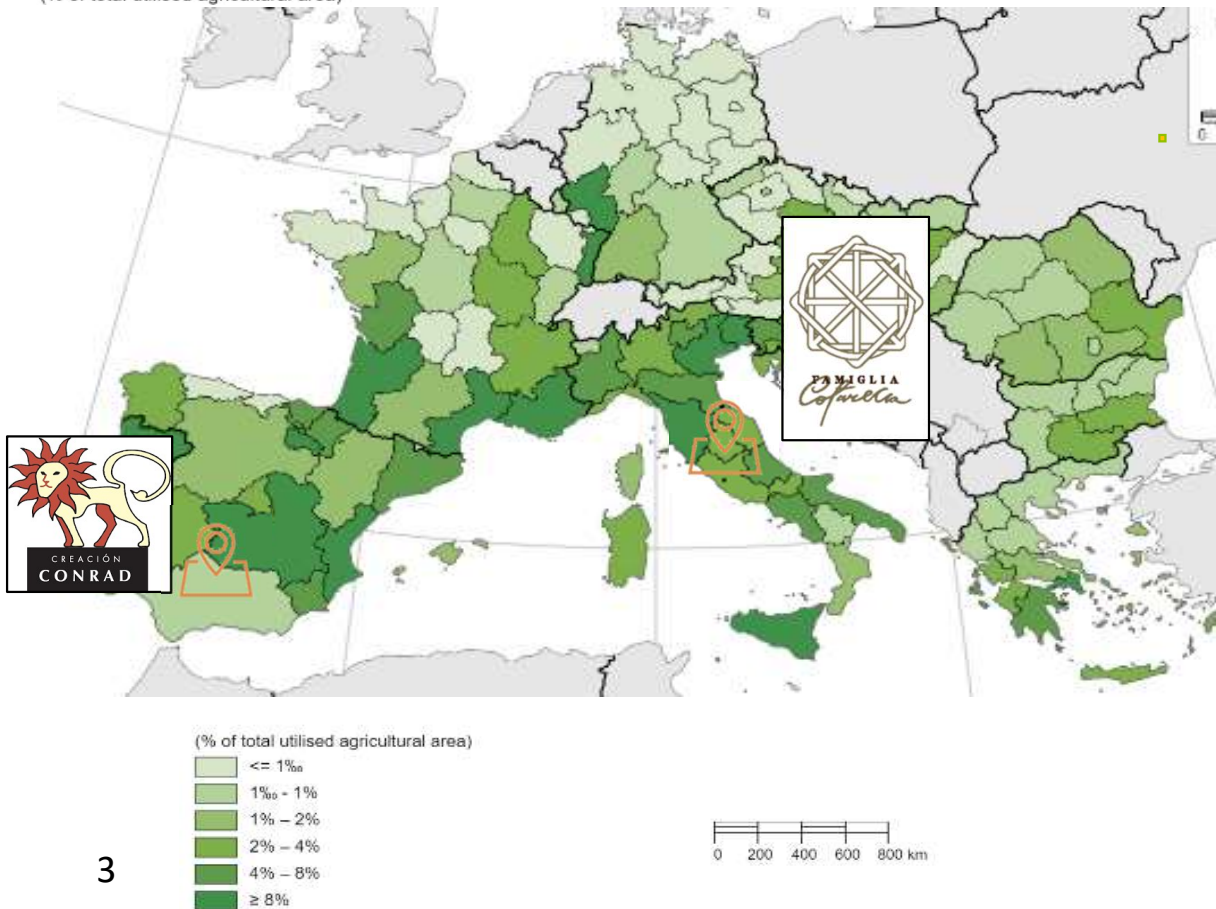


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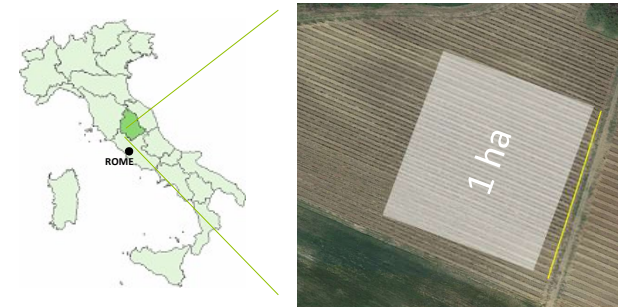
SITI SPERIMENTALI : Italia e Spagna

Map1: Area under vines, by NUTS2 regions, 2020
(% of total utilised agricultural area)



3

Italia → DOP Orvieto



1 ha VIGNETO SPERIMENTALE

Cvs Chardonnay

- Coltivata in 41 Paesi , 210.000 ha superficie nel Mondo (2015);
- Germogliamento tardivo ;
- Maturazione precoce; } **CICLO STAGIONALE BREVE**
- Medio vigore, grappolo compatto.

(OIV, 2017)

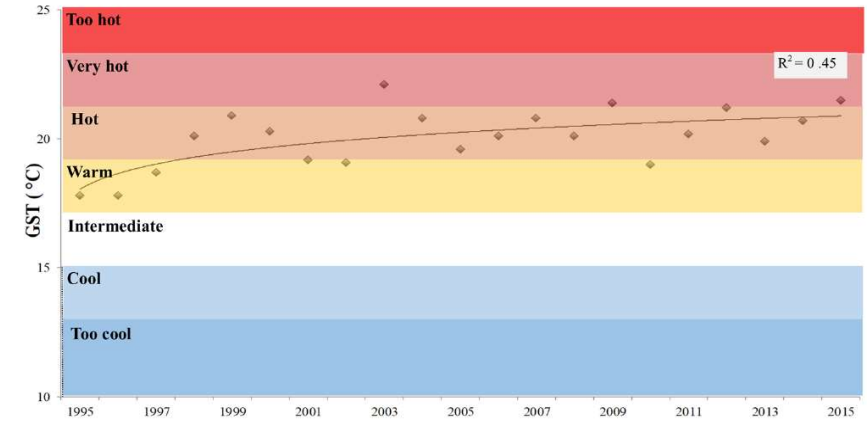
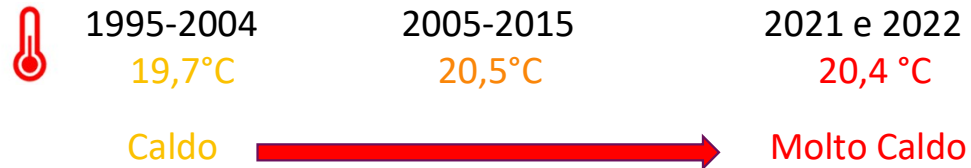


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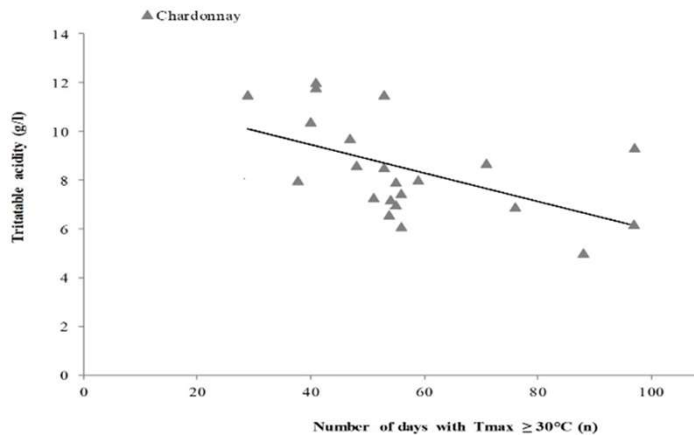


EMERGENZE AMBIENTALI *in corso*

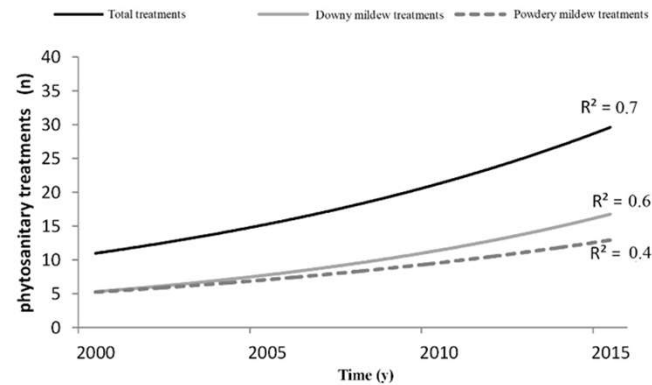
Temperature medie ciclo vegeto-produttivo (GST) tendenza in aumento



Ricadute qualità della produzione, epoca maturazione (-10 giorni tra 2021 e 2022)



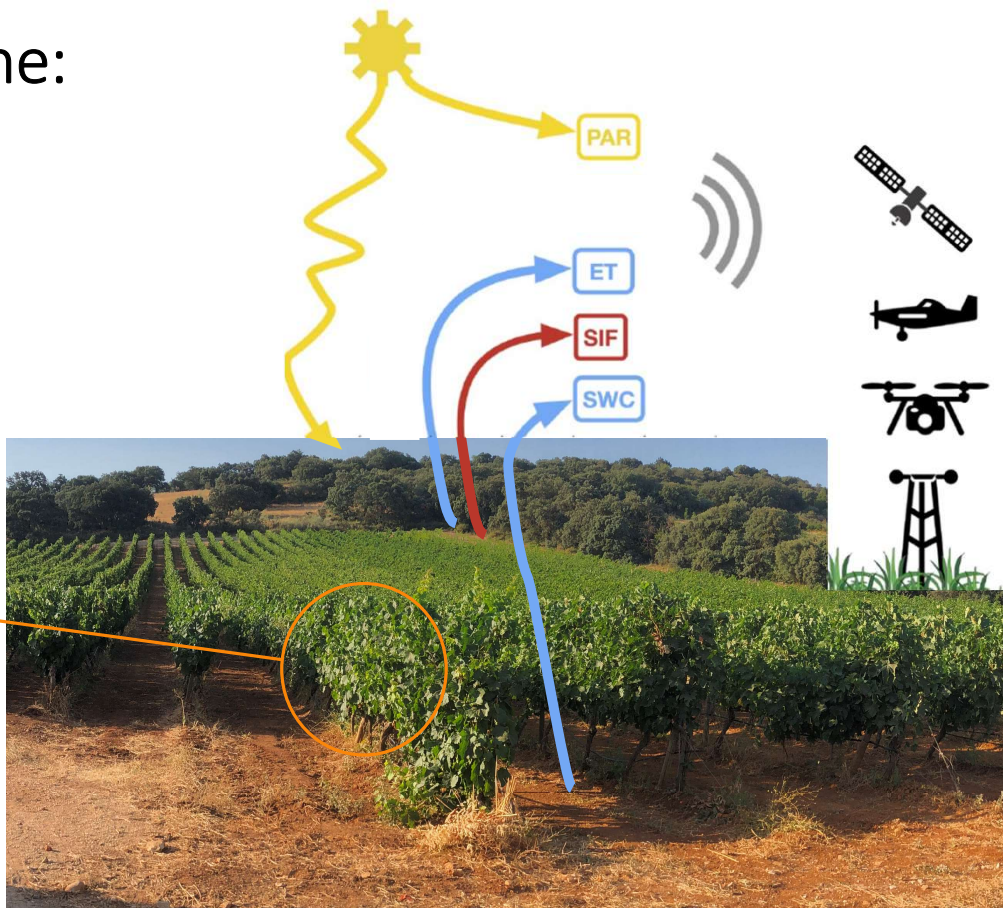
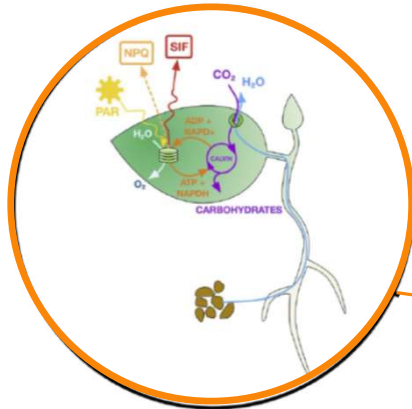
Avversità biotiche



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Scala di indagine:

Singola pianta



← Paesaggio

← Vigneto



Leaf porometer (SC-1, Decagon Devices, Pullman, WA).

Fieldspec 3.0

FluorPen FP 100 (Photon Systems Instruments).

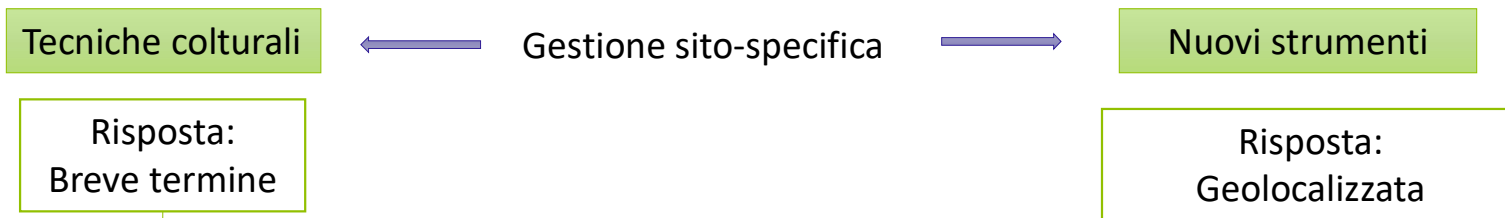
PAR: radiazione fotosinteticamente attiva; ET: evapotraspirazione; SIF: Fluorescenza della clorofilla *a* indotta dal sole ; SWC: contenuto idrico del suolo

Modificata F. Jonard, et al. 2020

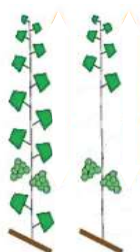
METTIAMOCI IN RIGA



SOLUZIONI PROPOSTE: Adattamento e Mitigazione

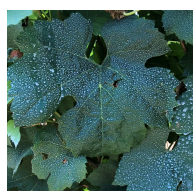


Defogliazione PRECOCE



Fioritura

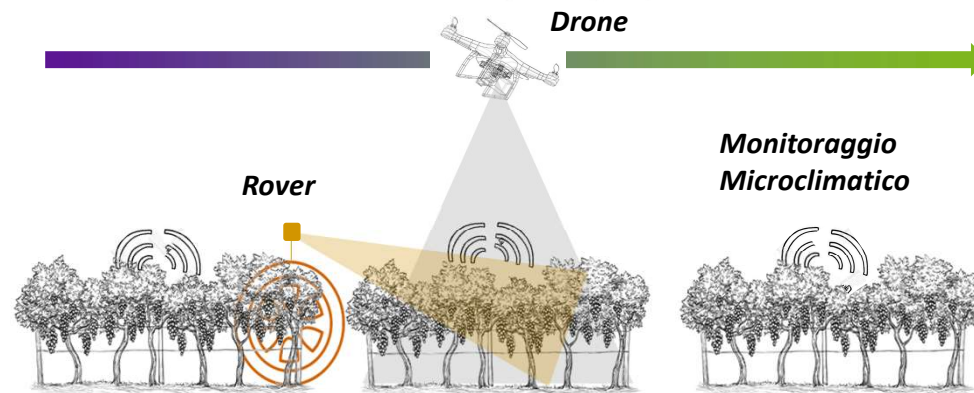
Tattamento fogliare
FARINA DI BASALTO



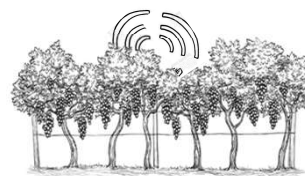
Concimazione
Organo-Minerale



Drone



Monitoraggio
Microclimatico

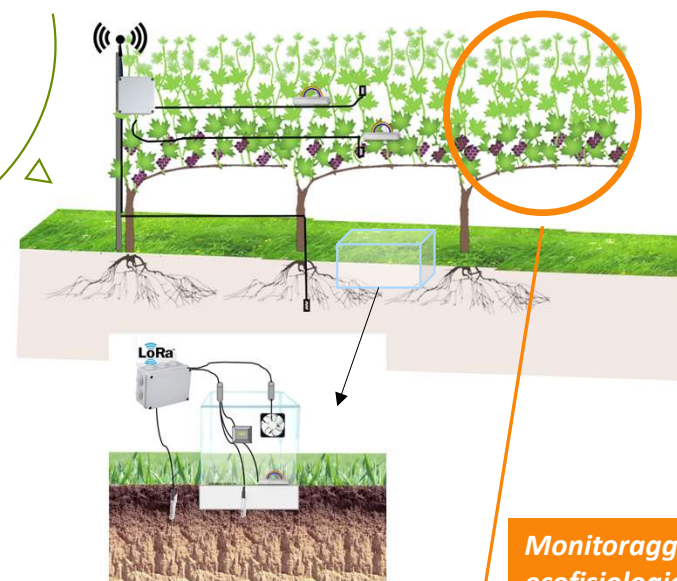
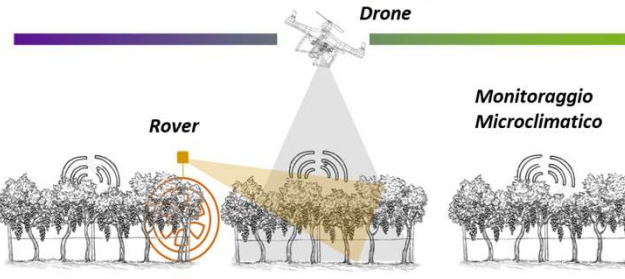


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Details of Ground Sensors Systems (GSS)

Nuovi strumenti



Monitoraggio ecofisiologico



Leaf porometer (SC-1, Decagon Devices, Pullman, WA).



Fieldspec 3.0



FluorPen FP 100 (Photon Systems Instruments).

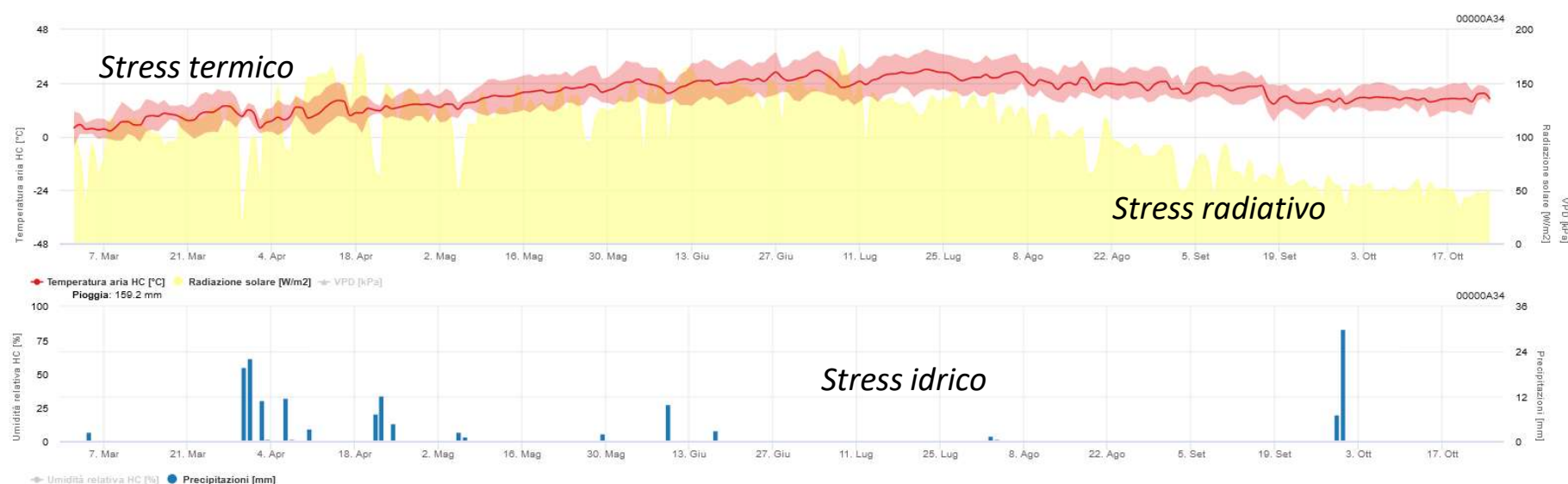
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Monitoraggio microclimatico

Stagione 2022

Indice HUGLIN > 2600 GG → ESTREMAMENTE CALDO



Risposta breve termine: ecofisiologia della vite



Conduttanza stomatica → Stress termico e idrico



Allegagione

Stress idrico

Optimum 'lieve o assente'

Raccolta

Stress idrico

Optimum 'moderato'



Concimazione OM:

Vigoria ↑
Conduttanza ↓

Trattamento
Farina di Basalto:

Vigoria ↑
Conduttanza ↑

Defogliazione precoce:

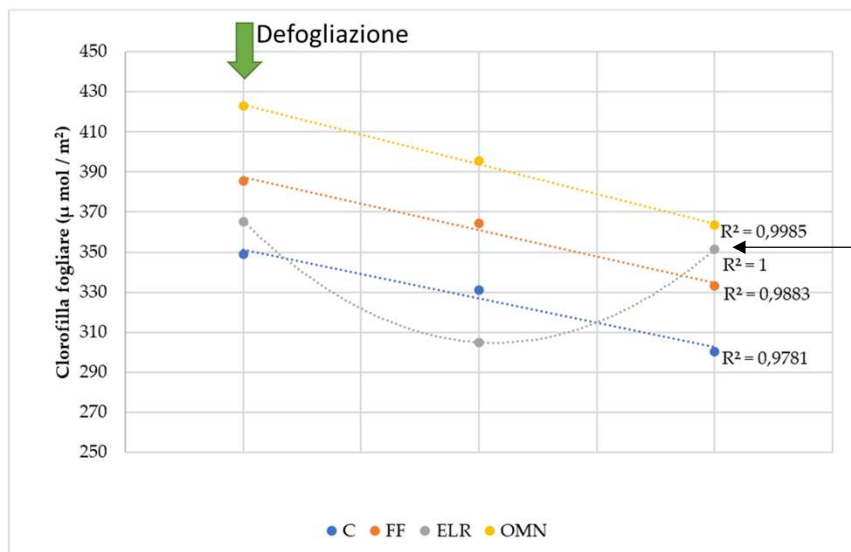
Vigoria ↓
Conduttanza =

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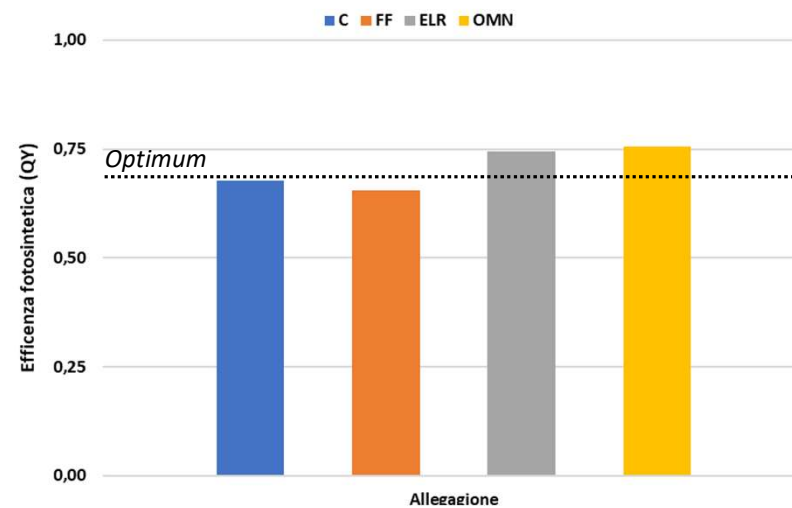
Risposta breve termine: ecofisiologia della vite

Fluorescenza della clorofilla *a* → Stress termico + radiativo + idrico



Ritardo
Senescenza fogliare

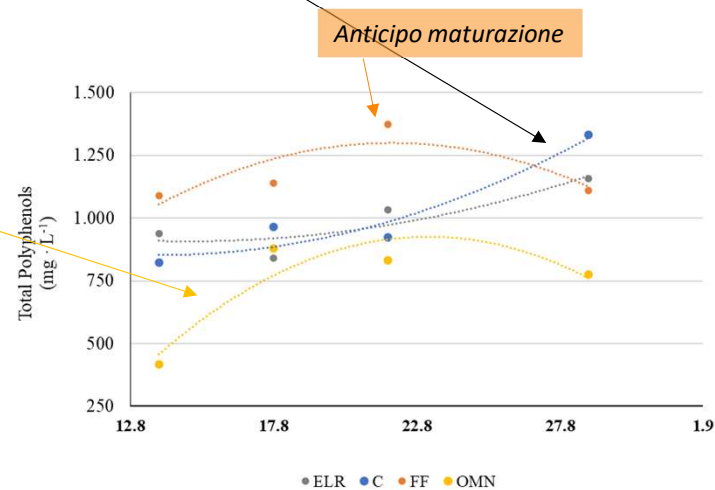
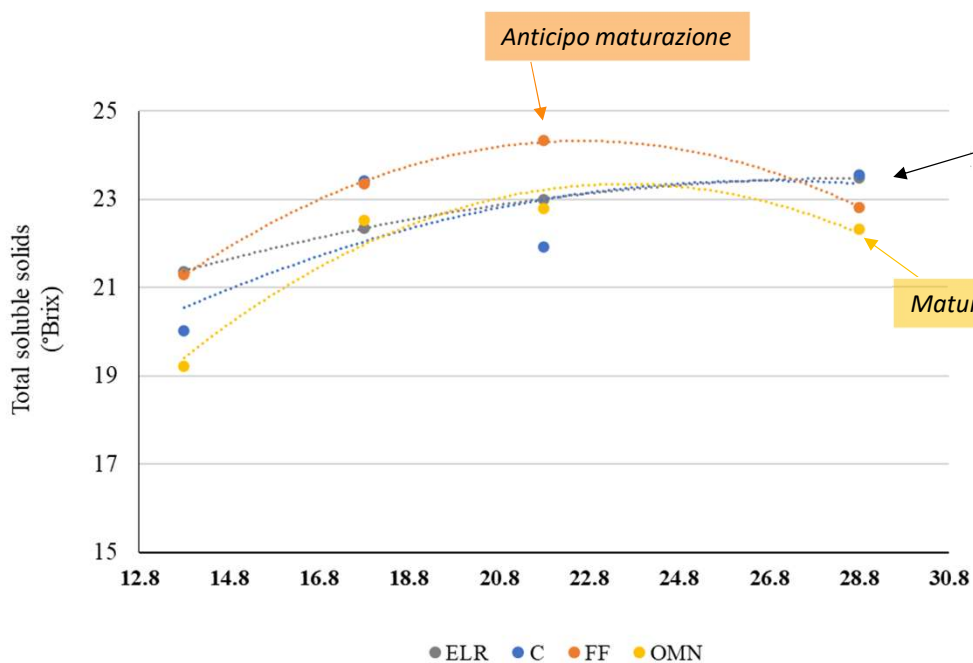
C: controllo
Ff: farina di basalto
Elr: defogliazione precoce
Omn: organo minerale



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Qualità della bacca



Monitoraggio da remoto: spazializzazione performance vigneto

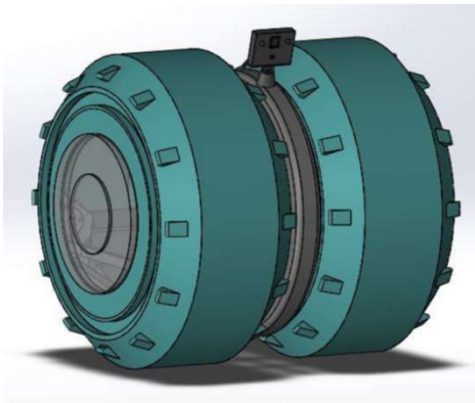
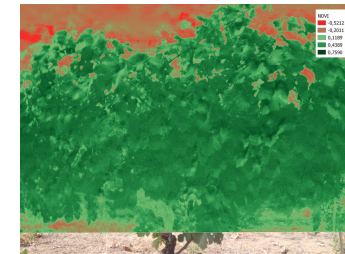


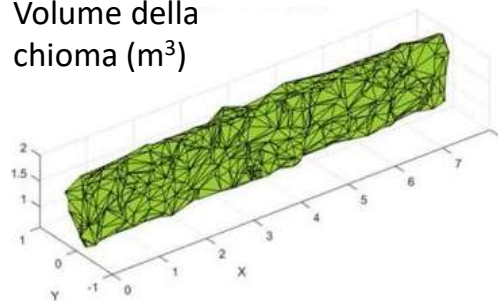
Immagine RGB



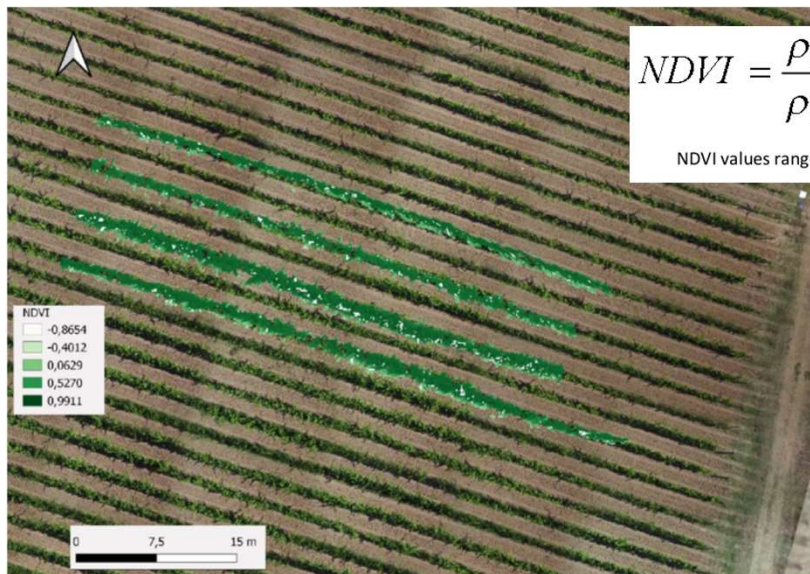
Indice vegetazionale
(NDVI)



Volume della
chioma (m³)

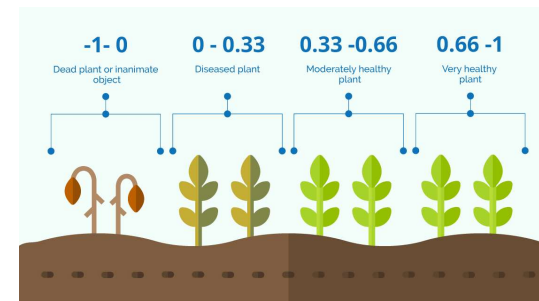


Monitoraggio da remoto: spazializzazione performance vigneto



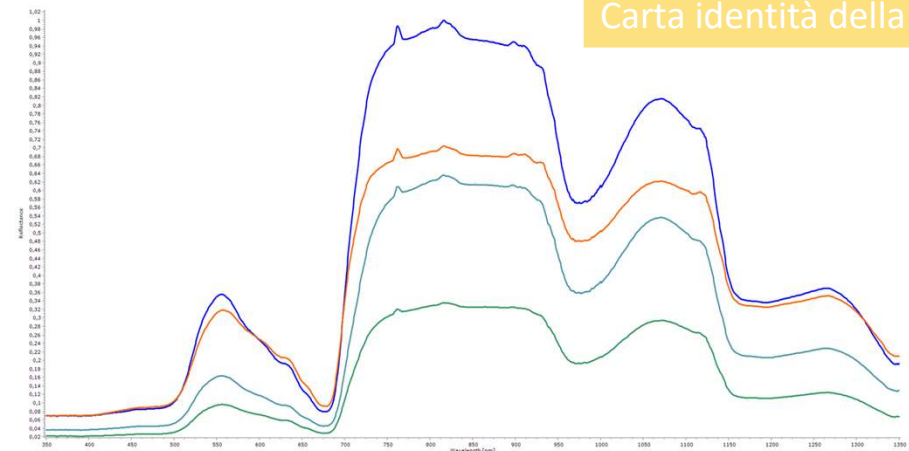
$$NDVI = \frac{\rho_{NIR} - \rho_{red}}{\rho_{NIR} + \rho_{red}}$$

NDVI values range from -1 to 1



Indici Vegetazionali = Stato di salute della pianta
Performance vegeto-produttive

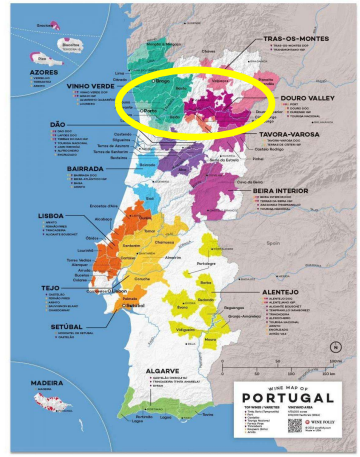
Carta identità della bacca





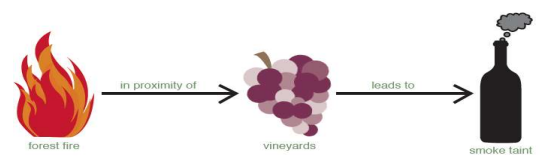
Replicabilità del progetto

- Altre regione viticole : PORTOGALLO
CINA

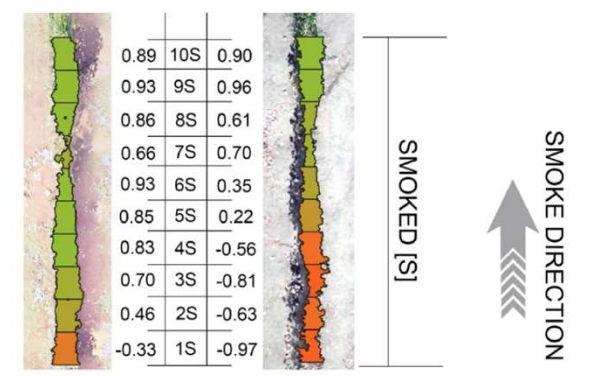


- Altre colture: frutteti (olivo, actinidia, melo, etc)

- Altre emergenze ambientali
 - Es. impatti incendi



☐ Mappa danni provocati →



Brunori et al.2020

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