LIEN
DE LA VIGNE

VINELINK INTERNATIONAL
www.liendelavigne.org

ASSEMBLEE GENERALE 2017
2017 General Assembly

NOUVEAUX OUTILS POUR LE SUIVI DE

LA QUALITE DES RAISINS :

Capteurs, analyse des données, outils

d'aide à la décision

New tools for monitoring grapes quality : sensors, data analysis, decision

COMITÉ CHAMPAGNE CIVC

Comprehend Vigour and Vegetative growth of the Vine To Manage its Balance

Julie Perry

31/03/2017

I

Characterise the balance of the vine

A vine plant balanced

Definitions

Physics

When several forces or elements act on a system and equipoise each other not modifying its state.

Ecological

Situation in which the interactions between flora and fauna, soil and vegetation of an environment make its structure and functioning remain stable and constant.

Literary

Quality of an harmonious disposition of a composition or a state.

?

A vine plant stable is balanced
A lot of vines are not balanced
If a vine is not balanced, it will find another state of balance
The balance of a vine plant is not necessarily the balance the grower wishes

Some specifications

Vigour
Rythm and **intensity** of the **growth** of the shoot

evaluation → average diameter of shoots or growth speed

Power
Total dry matter produced during the season

evaluation → pruning woods wheighing, harvest wheighing

Vegetative growth
Part of the power due to ***vegetative organs***, biomass produced during the season

evaluation → leaf area, number of shoots

The « wished balance »

Wheel of **stocks** enabling setting up of organs linked with growth ; berries ripening and stocks replenishment

Evaluation → **Sufficient stocks, satisfying yields and optimal quality without excessive vigour**

Weak vigour
Insufficient stocks
Low yield

Wished balanced

Excessive vigour
Random quality
High yield

Vigour and vegetative growth

Vegetative growth

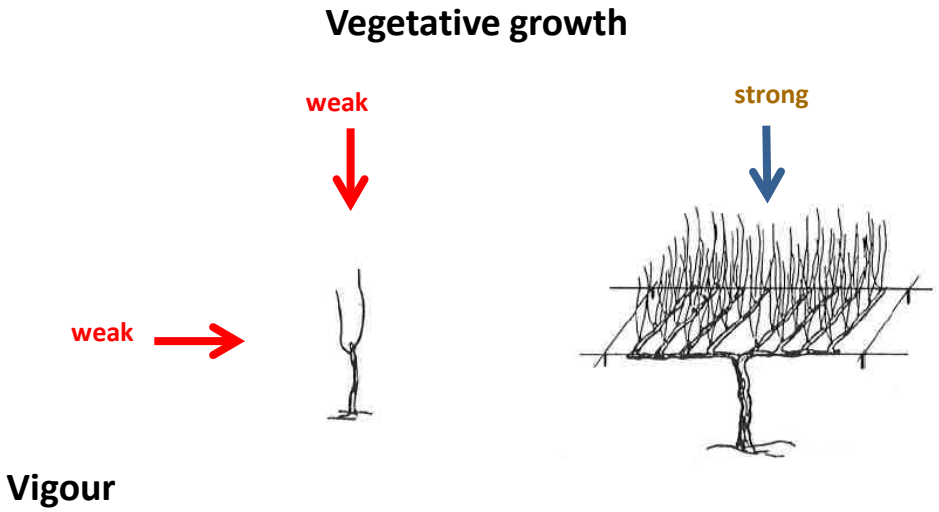
weak

weak

Vigour

Source: *Eléments de physiologie de la vigne et de viticulture générale, Champagnol,1984, p31-35*

Vigour and vegetative growth



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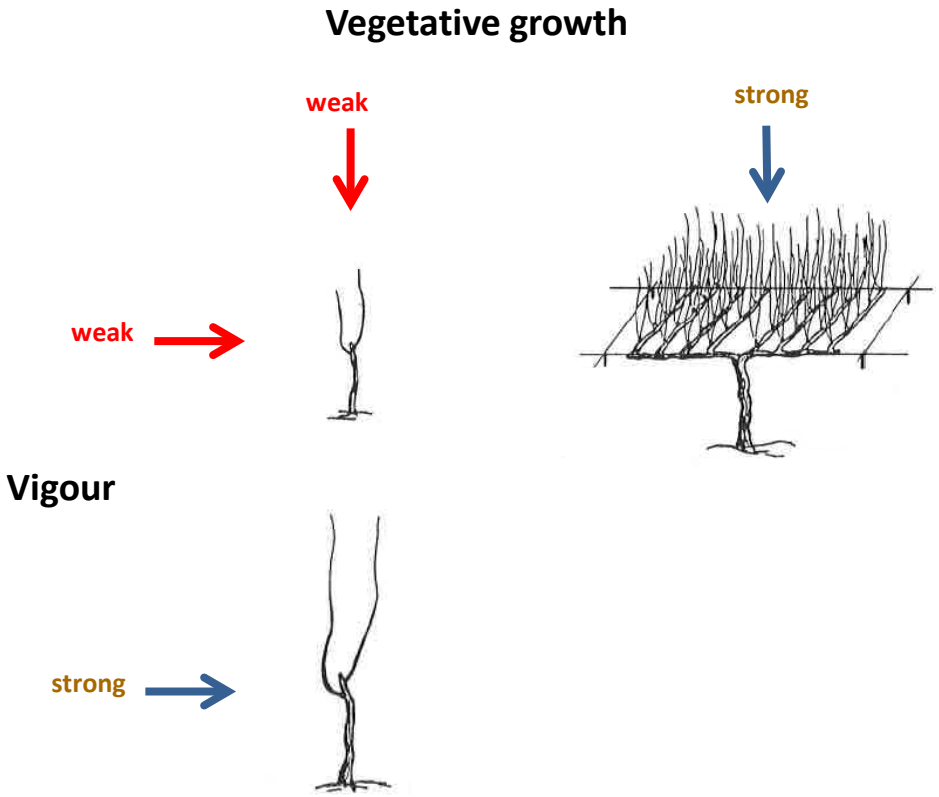
Vigour and vegetative growth



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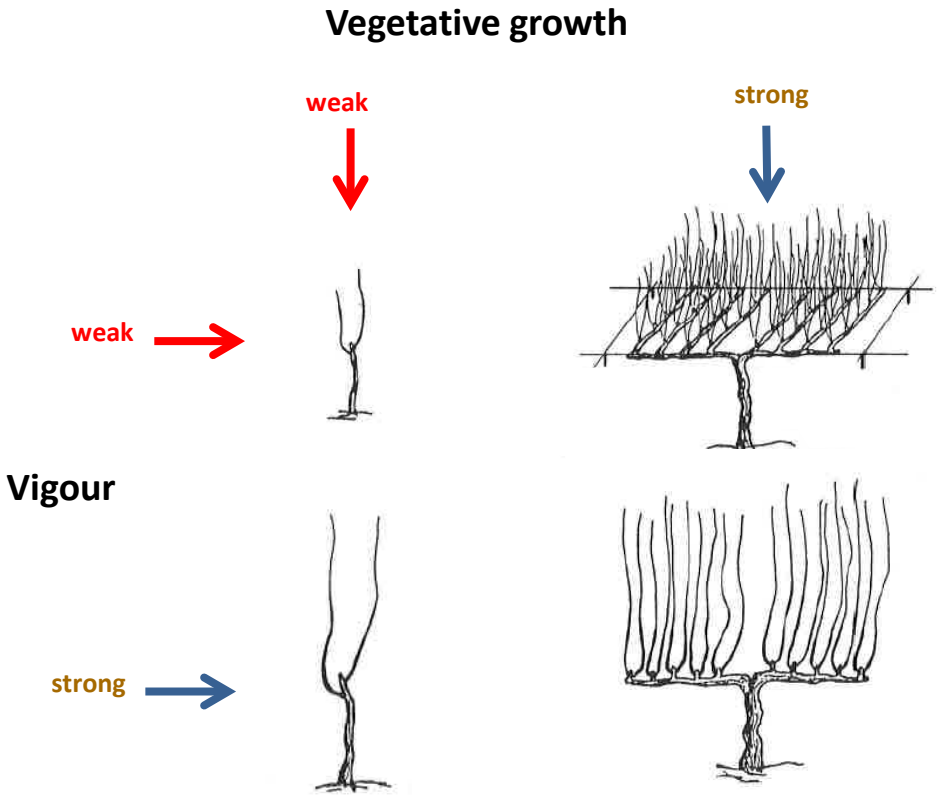
Vigour and vegetative growth



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Parameters of the balance

Climate

Temperature
Rainfalls

Soil

Water stocks
Fertility

Vine

Yield / Quality
Vigour / Vegetative growth

Vine growers

Specifications of the appellation
Personal aims
Political decisions

Pruning
Toping and trimming
Manure / fertilization
Protection
Vine plant choice
Ground cover management

The concept of balance

The concept of balance exists, the tough part is : what is the « wished balanced » ?

To manage the vine, we need to assess many parameters

Very effective sensor

Storage units in random logic
Subjective restitution
Information = memories

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II

Assess the Parameters of the Balance to Manage them

On-board sensors

- Objectify, automate and stock measures
- Map in high density
- Large-scale evaluation
- Measure variability
- Adjust customs within and between plots

Remote sensing

Vegetation index

Oenoeview, Airinov…

Diseases (flavescence)

Flytec, digitaler weinbau

Proxidetection

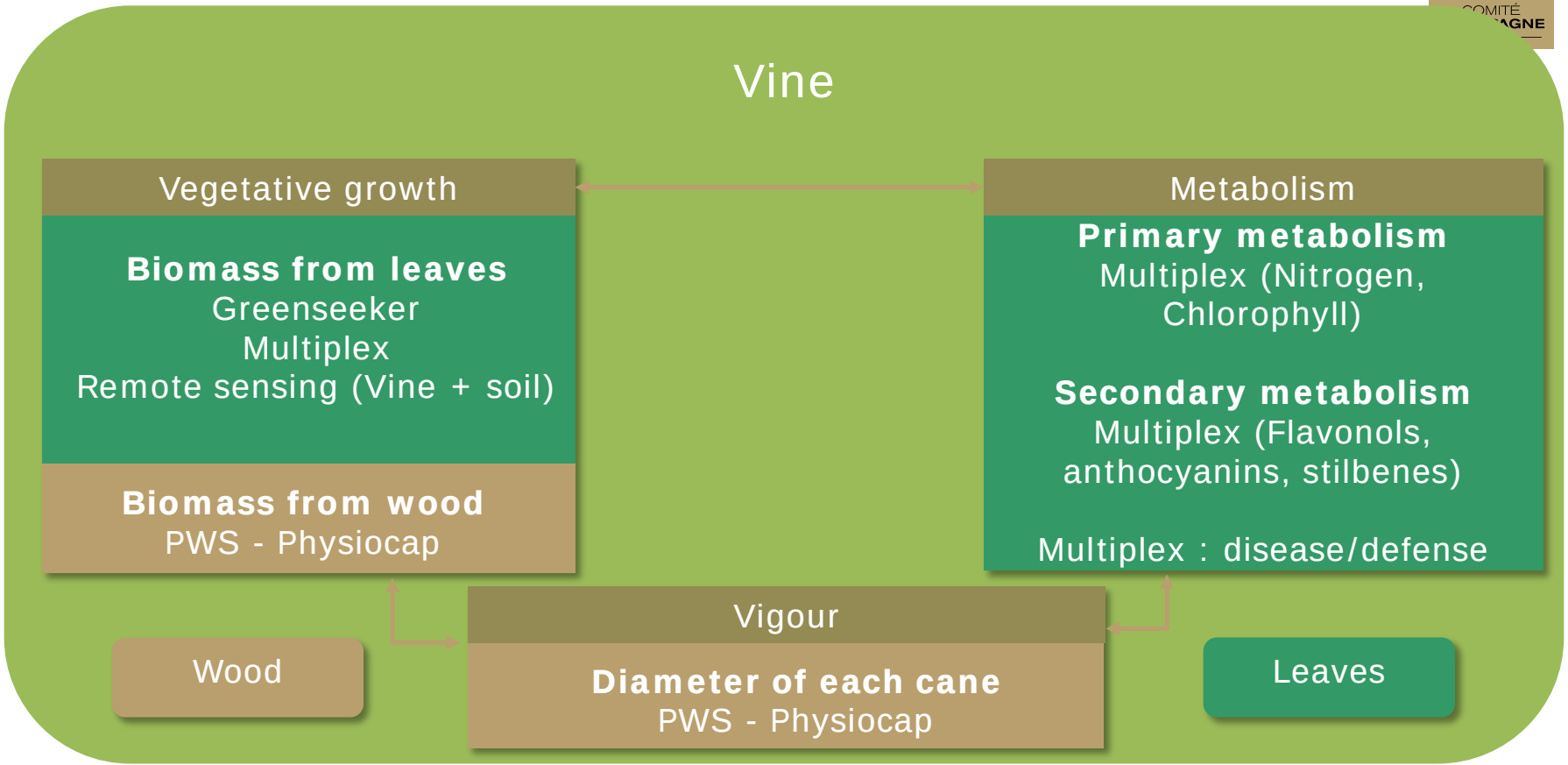
Greenseeker Trimble

Multiplex Force A

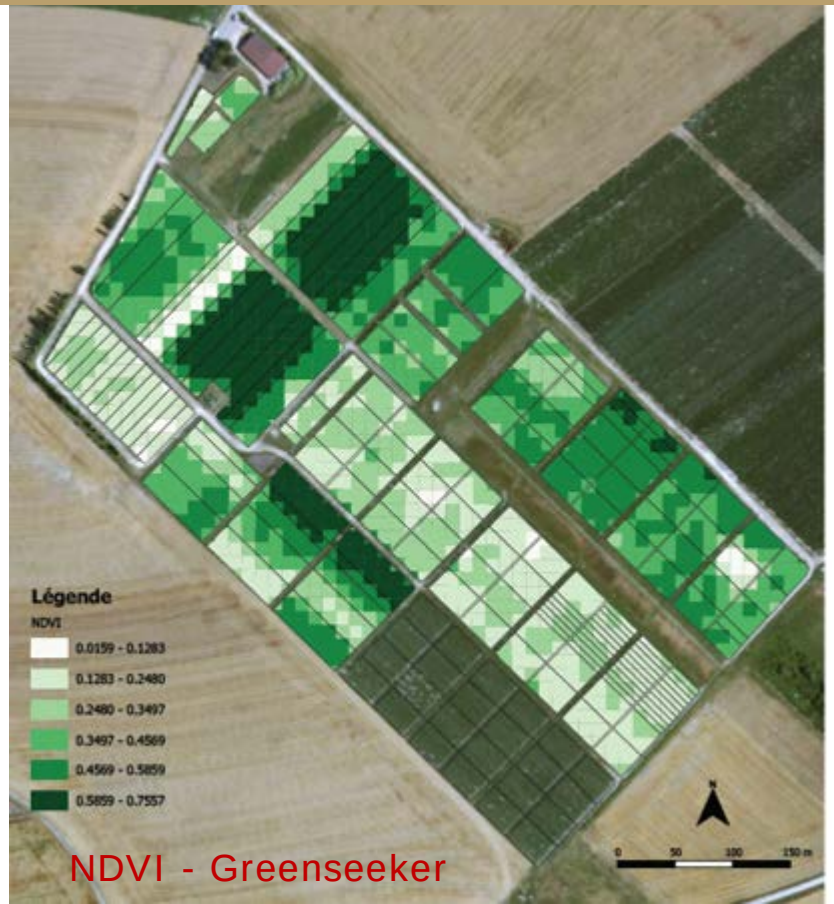
Physiocap CIVC

Multispectral camera (in dev.)

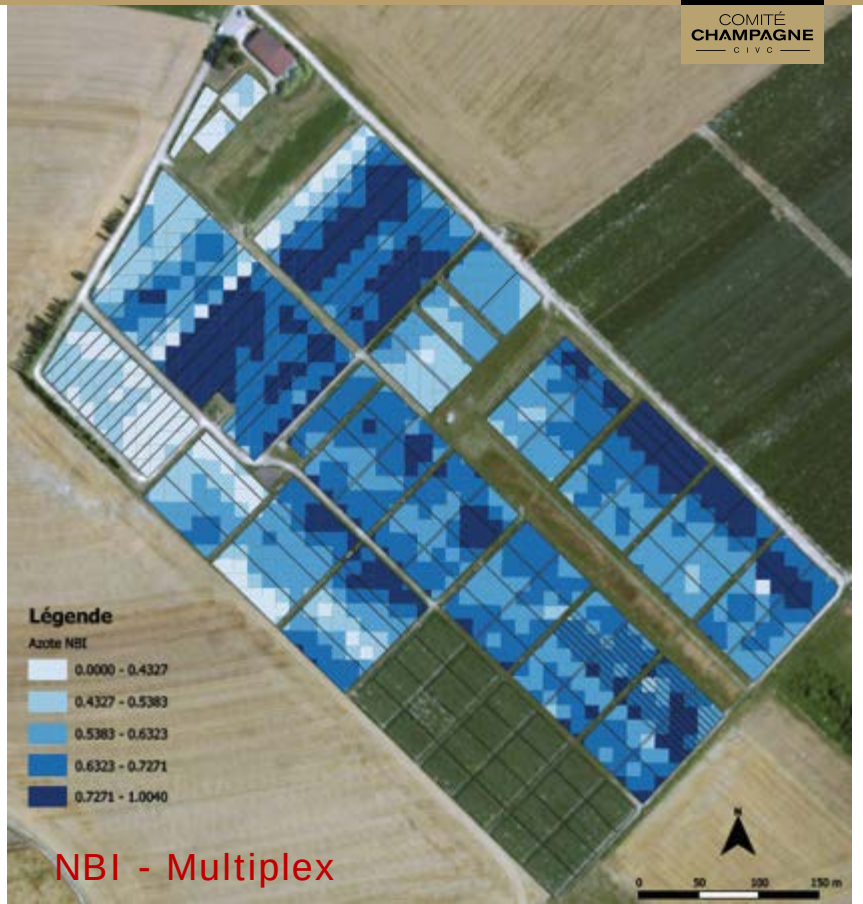
Caracterise the vine as a whole with sensors



Cartography of experimental vineyard in Plumecoq (june 2012)



NDVI - Greenseeker



NBI - Multiplex

Remote sensing in viticulture: agronomical path

Winter Pruning woods

Canopy

Wine

Potential

Physiocap (PWS) + Soil

Soil characteristics
Vigour (diameter of canes)
Wood biomass (vegetative expression)

Year / vintage

Vegetation sensor

Multiplex and Greenseeker
Expression of the potential
Evaluation of the year profile

Result

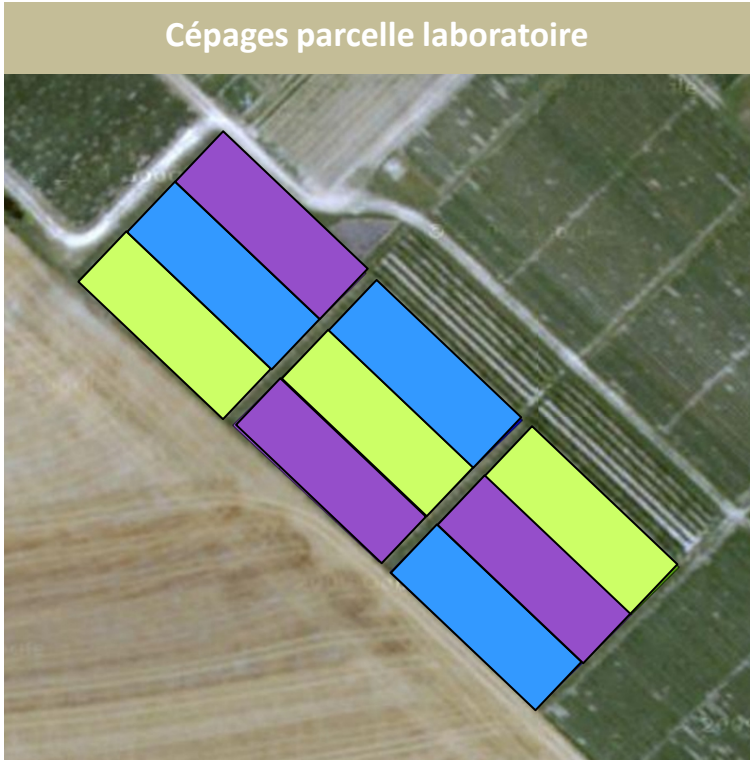
Harvest

Agronomical parameters ; musts and wines quality

PATH for the AGRONOMIST

Remote sensing in viticulture: agronomical path

Exemple of a specific case : « terroir » plot, at Plumecoq



Traditional measurements : yield, ripening, diseases, total leaf area…

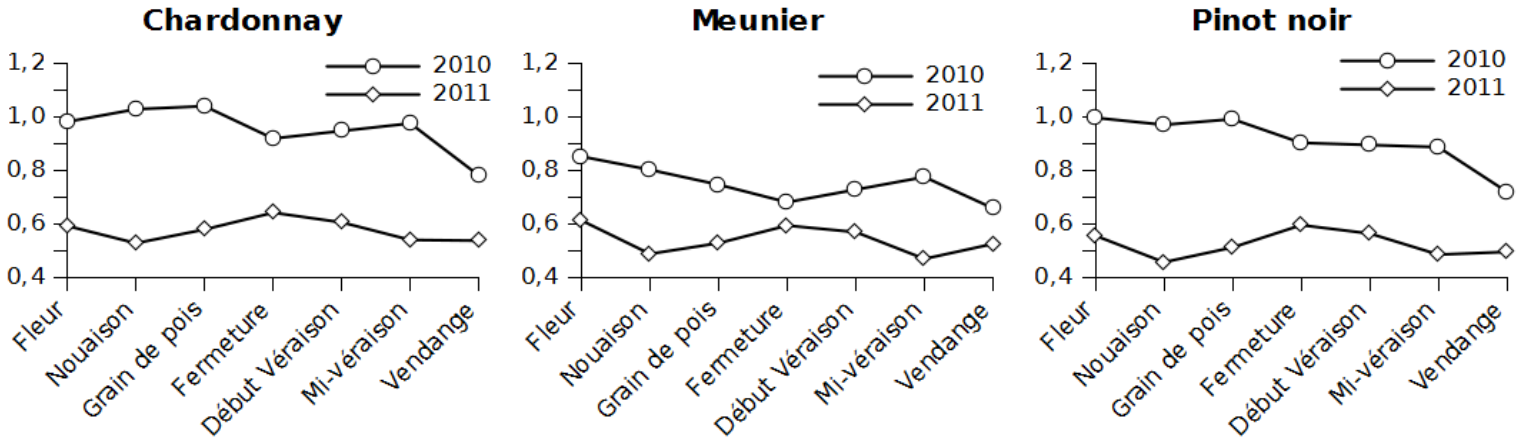
Measurements from fixed sensors : water probes, weather stations

Measurements from on-board sensors: remote sensing, Multiplex, Greenseeker, Physiocap

Remote sensing in viticulture: agronomical path

Exemple of a specific case : « terroir » plot, at Plumecoq

Evolution of the NBI (leaf Nitrogen – Multiplex) in 2010 and 2011



Remote sensing in viticulture: agronomical path

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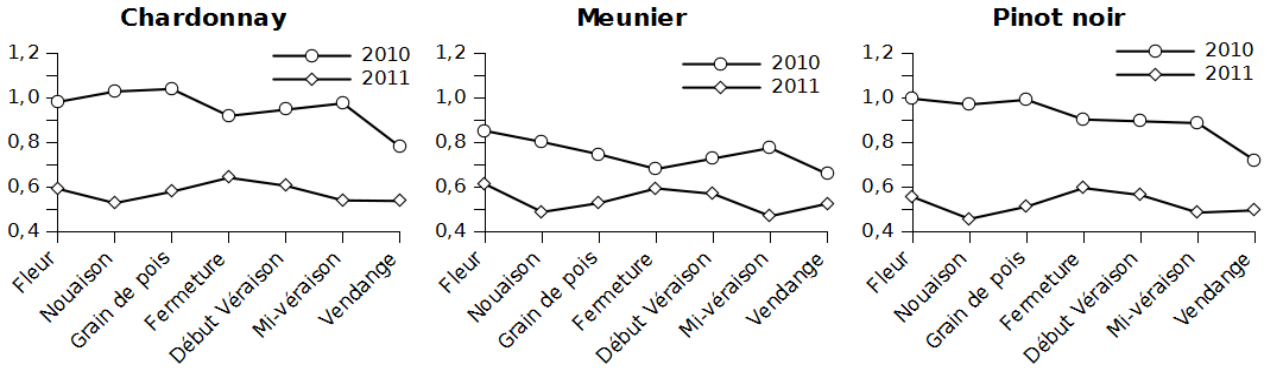
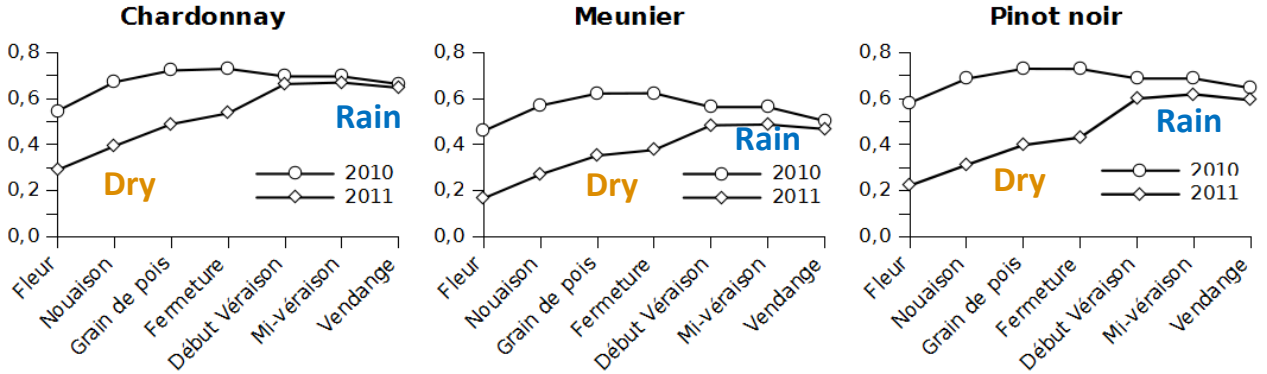


Evolution of the NDVI (greenseeker) in 2010 and 2011



Linking of agronomical variables
Combined index

Raw index

Strong relation to agronomical parameters → depending on varieties, dates and vintages

Index combination

Strong relation to whole agronomical parameters → comparision between varieties, dates and vintages

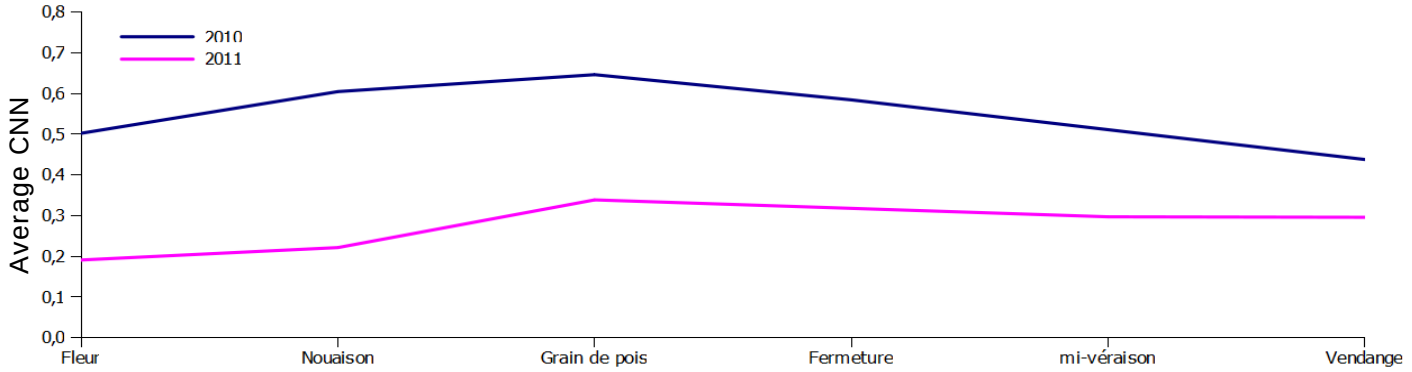
CNN : « Combinaison Nutrition Azote »

Index = f(Vegetative growth ; concentration)

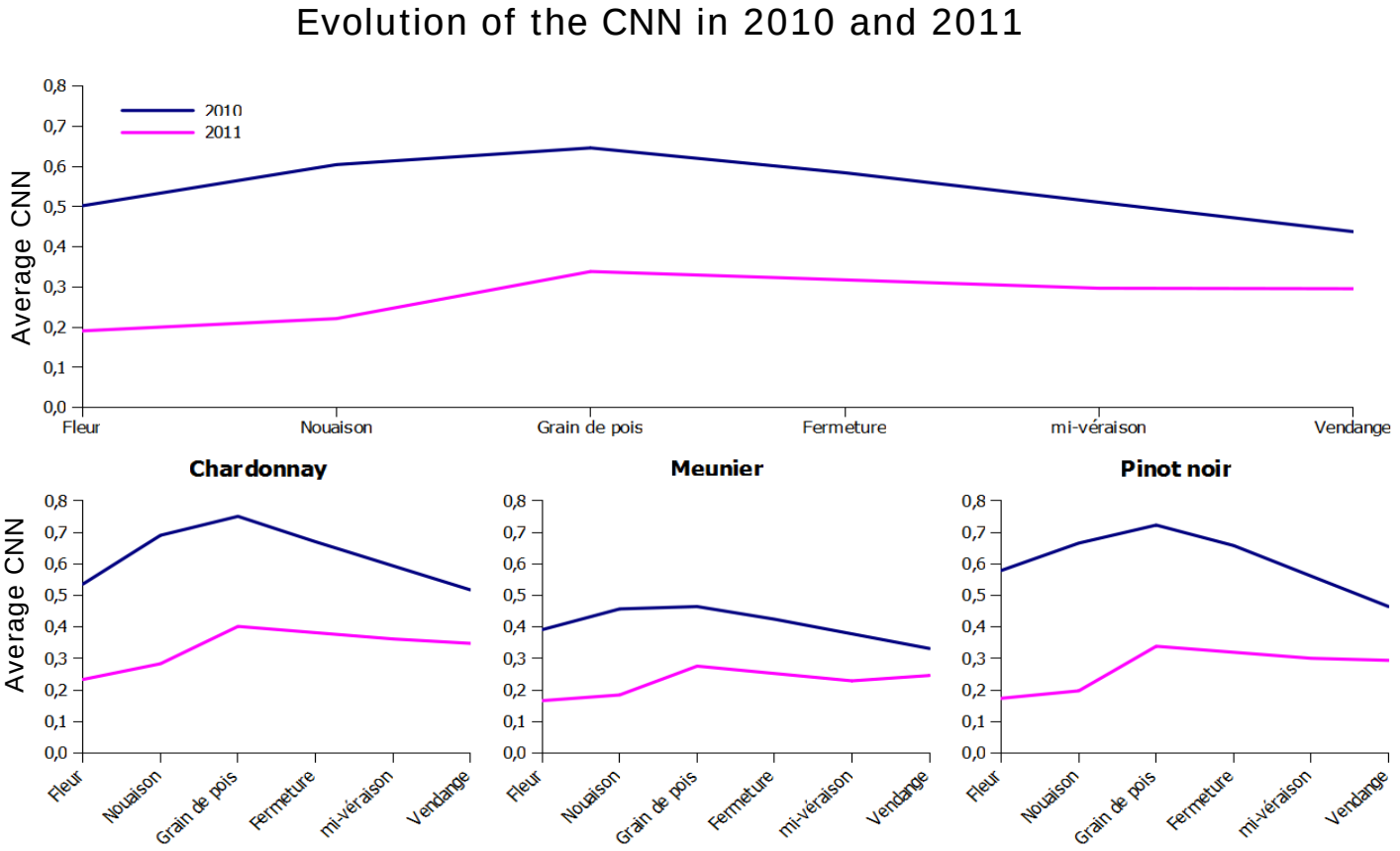
CNN = f(NDVI ; NBI)

Linking of agronomical variables
Combined index

Evolution of the CNN in 2010 and 2011

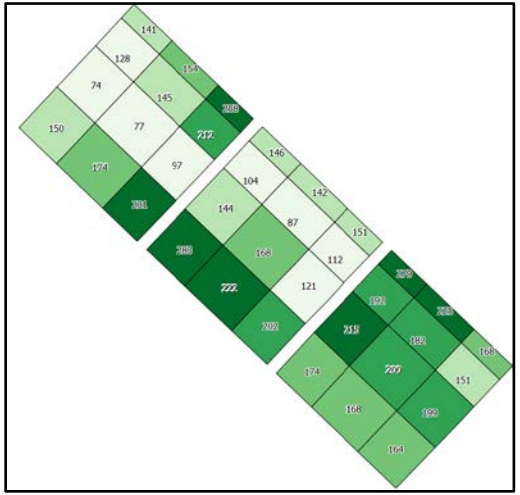


Mises en relation avec variables agronomiques
Indices combinés

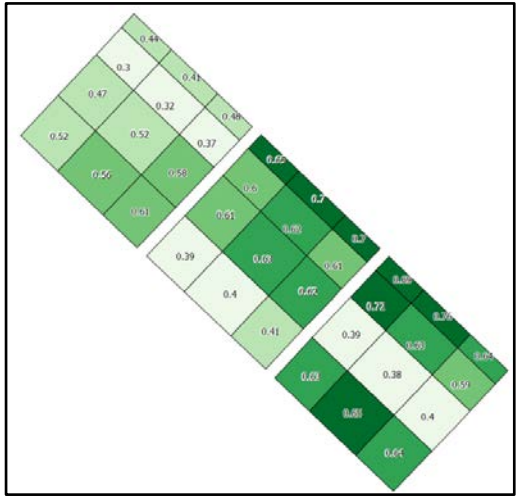


Mises en relation avec variables agronomiques
Indices combinés

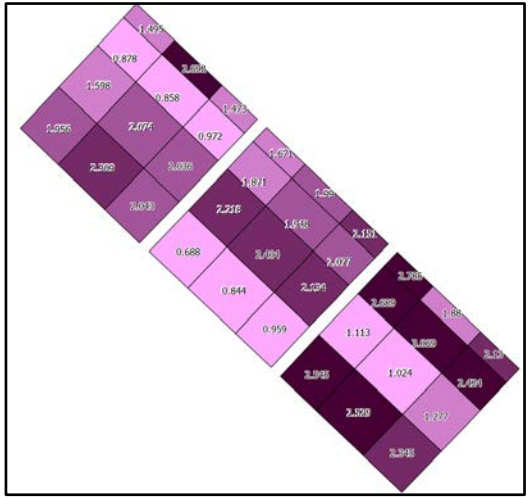
Total N in musts (mg/L)



CNN

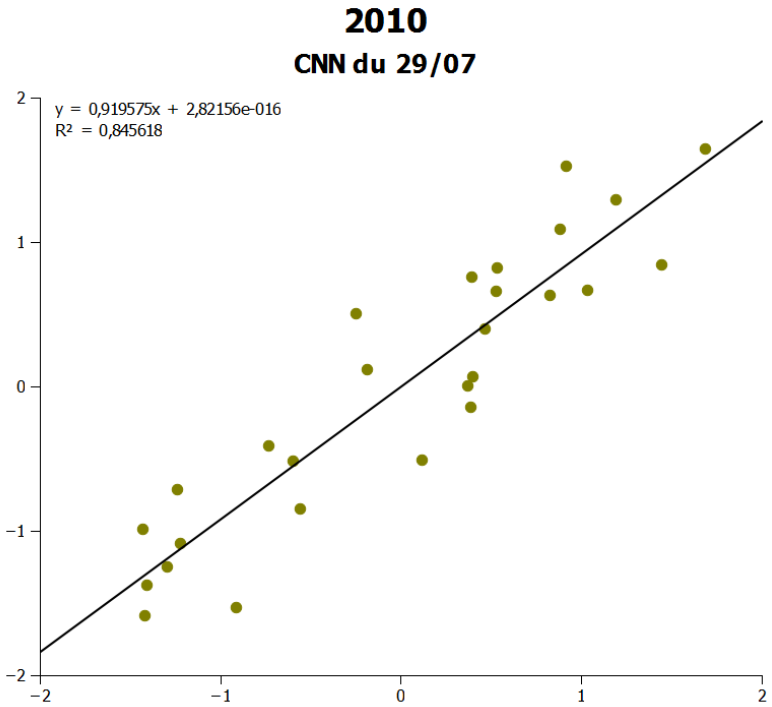


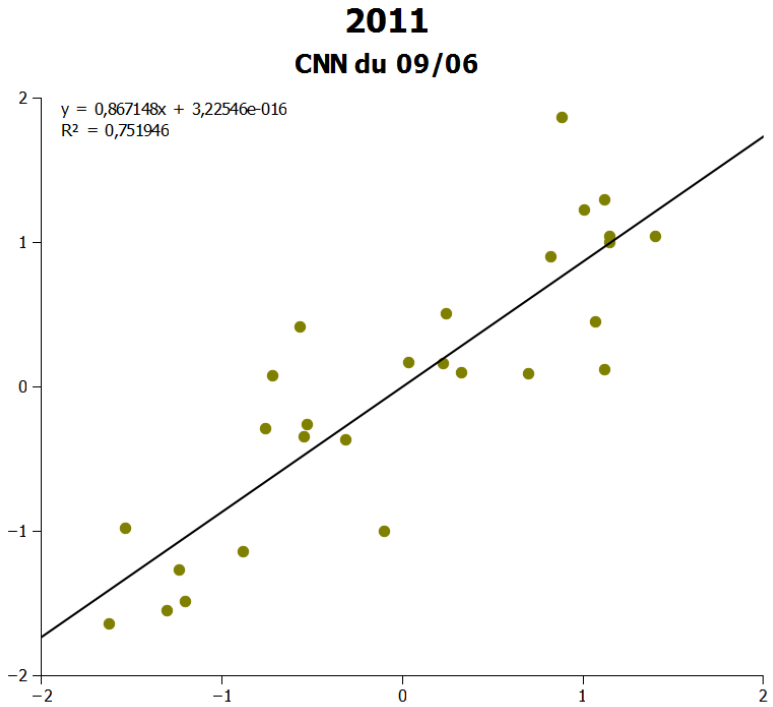
Yield (kg/vine)



Linking of agronomical variables
Combined index

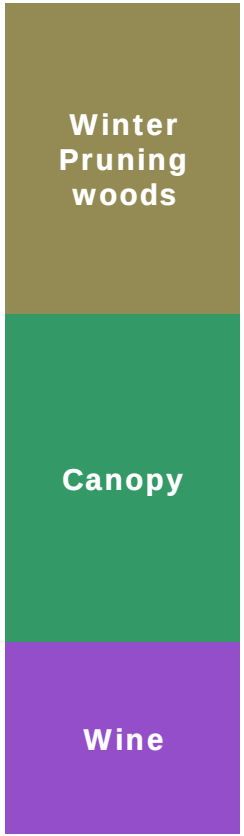
CNN vs yield/vine (3 varieties, reduced centraled distribution of datas)





On-board sensors → agnomical comprehension → balance management

Agronomical analysis



Potential : cane and soil sensor

Physiocap

Adjustment **of manure** (N)
Size and intensity of **ground cover**
Adjustment of the **pruning**

Vintage : Vegetative sensors

Multiplex and Greenseeker

Adjustment of **ferric chelates**
Input of **leaf N**
Adjustment of **canopy size**
Fongicides ?

Result : Harvest

Ripening controls ; **plot selection**

Wine growers manage the balance

VIGNERONS ET MAISONS

LE COMITÉ CHAMPAGNE VOUS REMERCIE DE VOTRE ATTENTION !

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