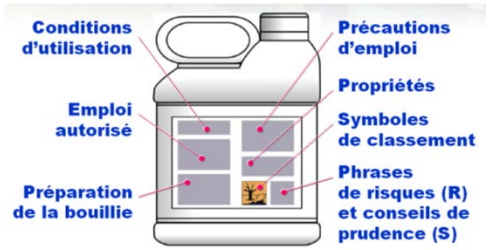
Optidose®, a method using an adjustment of the pesticide dose and DeciTrait®, a new Decision Support System for the vineyard protection

A. DAVY

M. RAYNAL - M. CLAVERIE et al.

Barcelone, Wednesday 7 november 2018



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However, many parameters can be very different between two treatments:

- ✓**Quantity of leaves to protect**

VINOPÔLE
BORDEAUX-AQUITAINE

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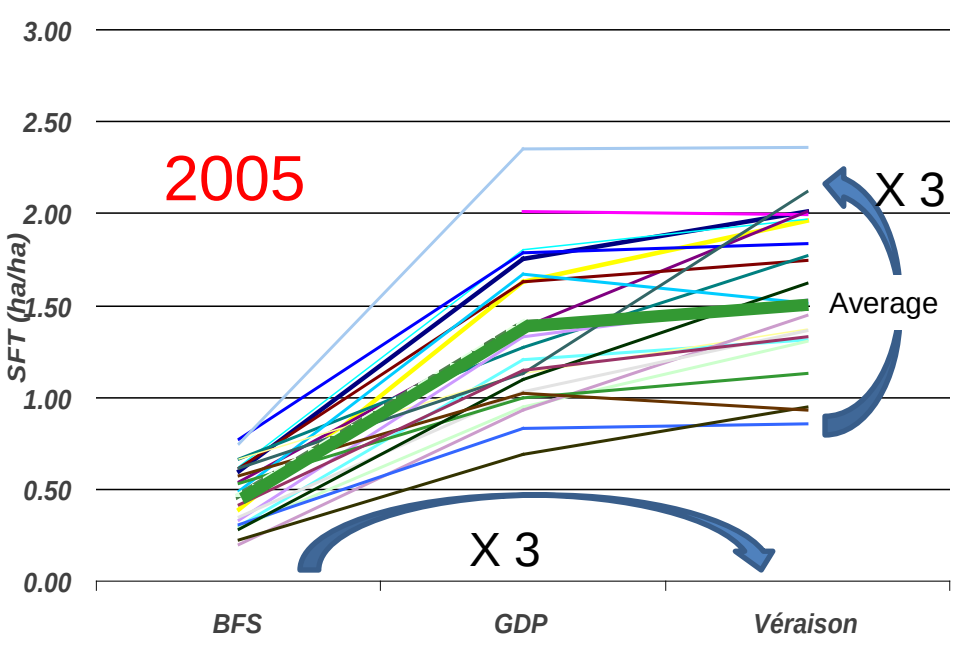
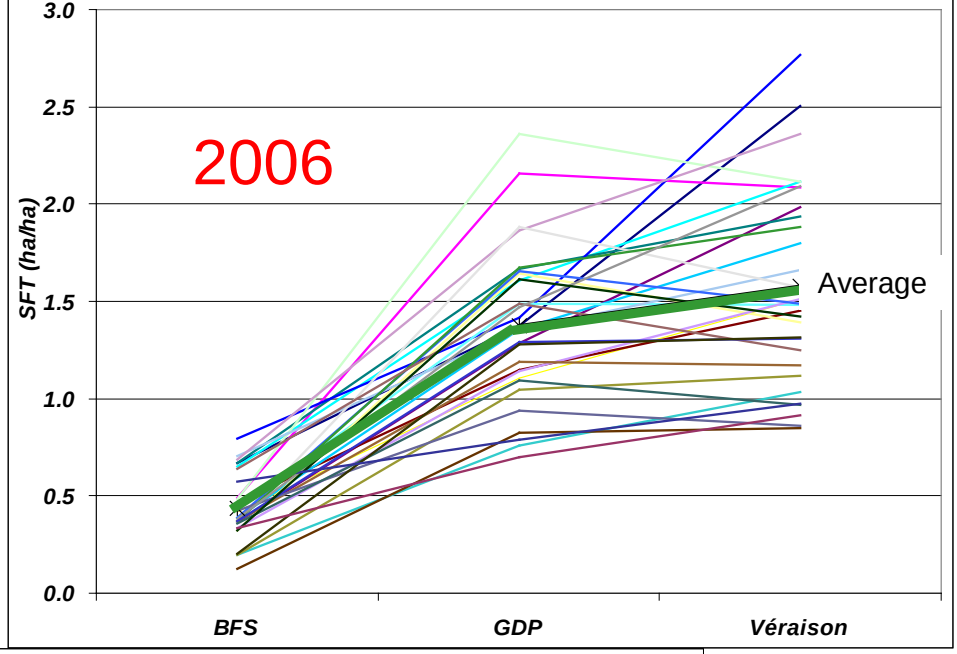
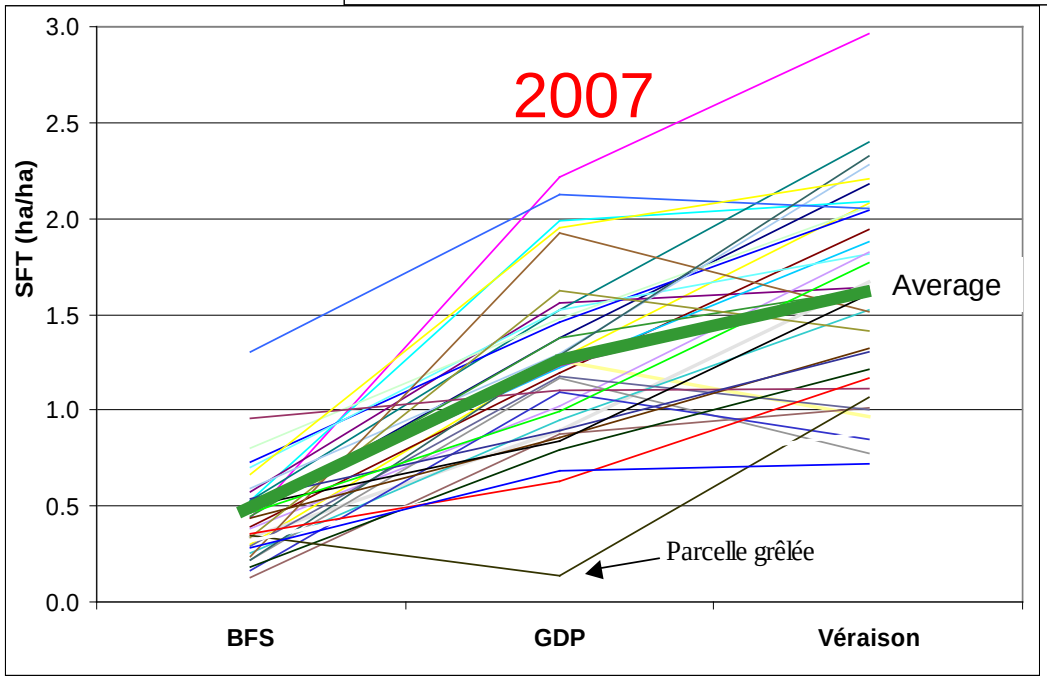




Aquitaine



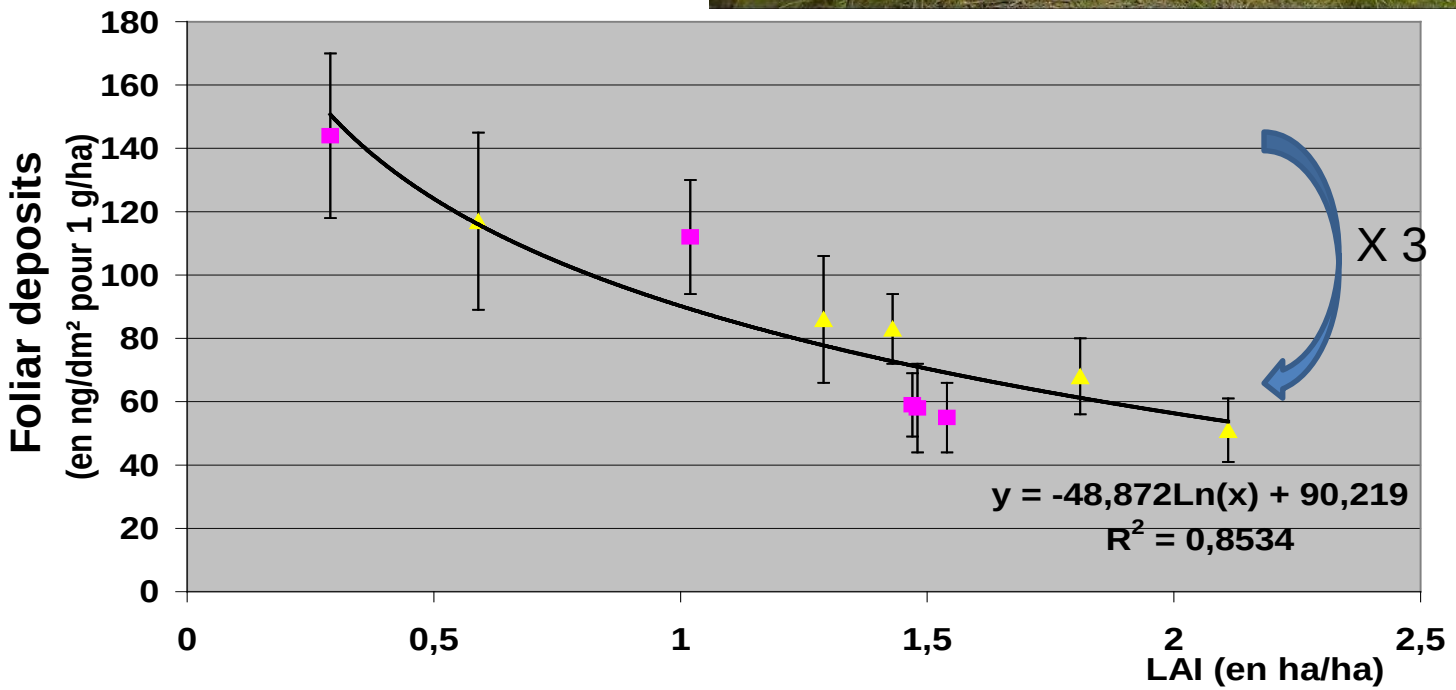
Charentes

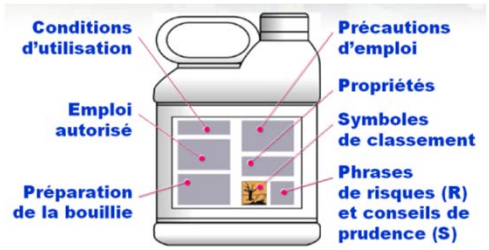
BBCH 57 75 85

Impact of vegetation (quantity and density) on the amount of product deposited

Spraying of a tracer

Quantification of deposition of tracer in the laboratory





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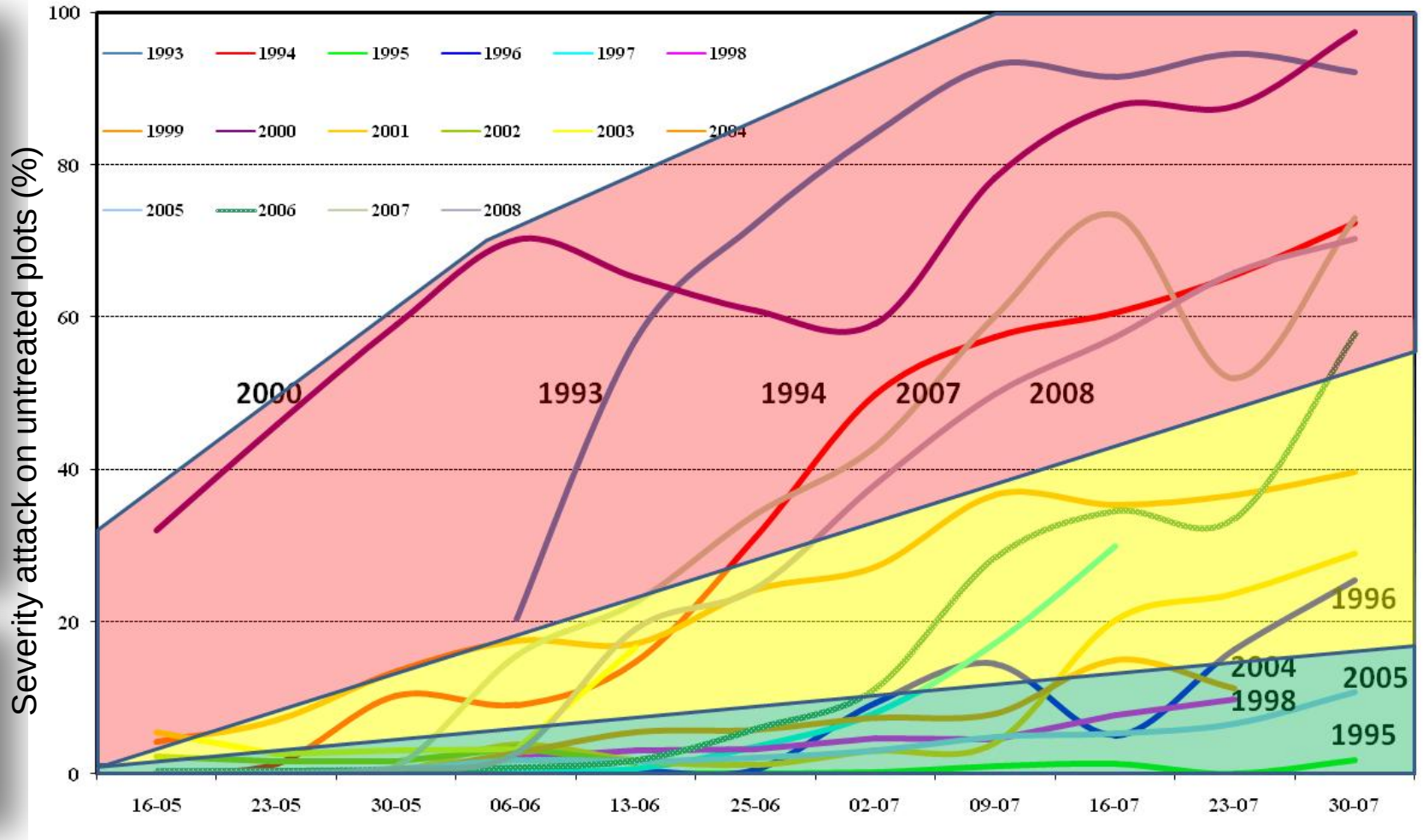
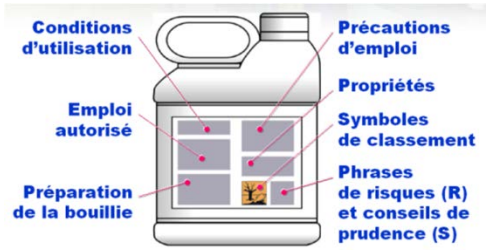
✓**Quantity of leaves to protect**

✓**Pathogenic virulence**

A high variability of parasite pressure between vintages !





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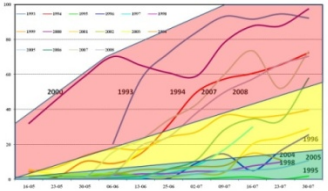

✓**Quality of spray**

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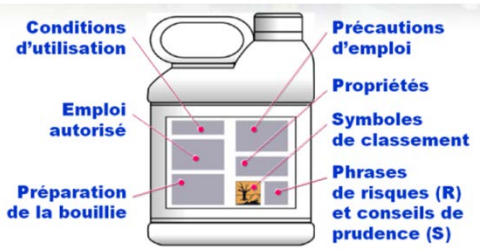

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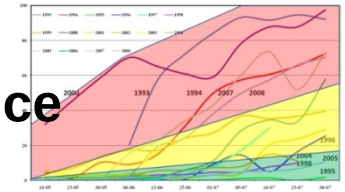

✓**Quality of spray**

✓**Climatology (leaching of the products)**

✓**Tissue susceptibility…..**

Always the same dose ?!

An old question...

When we started to work on this subject, the official speech was :

« **The dose, only the dose, all the dose !!!** »

1995 -2001 : Systematic dose reduction trials (25%;50%;75%;100%)

the good reduction was different every year…..

2002 : Marc Raynal proposes the first Optidose table

SFT (Ha/Ha)

	Expression végétative	Pression maladie	2 à 3 FE	BFA	BFS	Flo	Nou	GDP	Ferm	Ferm	Véraison
5,5											
5	forte	forte	50	70	80	90	90	90	100	100	100
4,5	forte	moyenne	25	30	40	60	70	80	80	90	100
4	forte	faible	20	20	30	50	60	70			70
3,5	moyenne	forte	50	70	80	80	80	90	80	80	80
3	moyenne	moyenne	25	30	40	50	60	70	70	70	70
2,5	moyenne	faible	20	20	30	40	50	50	40	40	40
2	faible	forte	50	70	80	80	70	60	60	50	50
1,5	faible	moyenne	25	30	40	40	50	40	30	30	30
1	faible	faible	20	20	30	30	40	30	20	20	20

Stades

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Field trials

2009 : LAI (ha/ha) --> Tree Row Volume (m3/ha)

2010 : Publication of the software on internet

Field trials in south-east of France (powdery mildew)

2014 : Regionalization of some decision rules

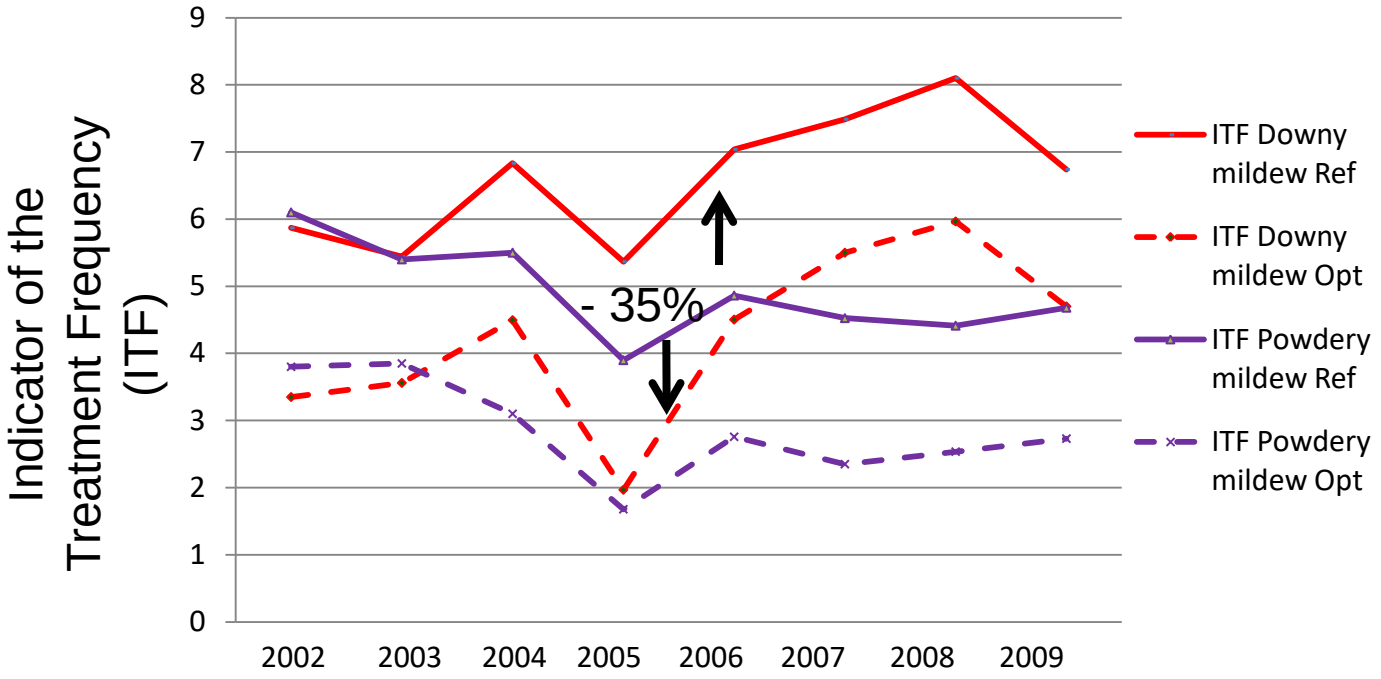
Trials in a collaborative network since 2002 :

- IFV 33,16,84
- CA 13,16,17,24,33,40,47,64,84

Three forms are compared : Untreated plot

Adapted doses (Optidose)

Registered doses (or farmer's dose) - Reference

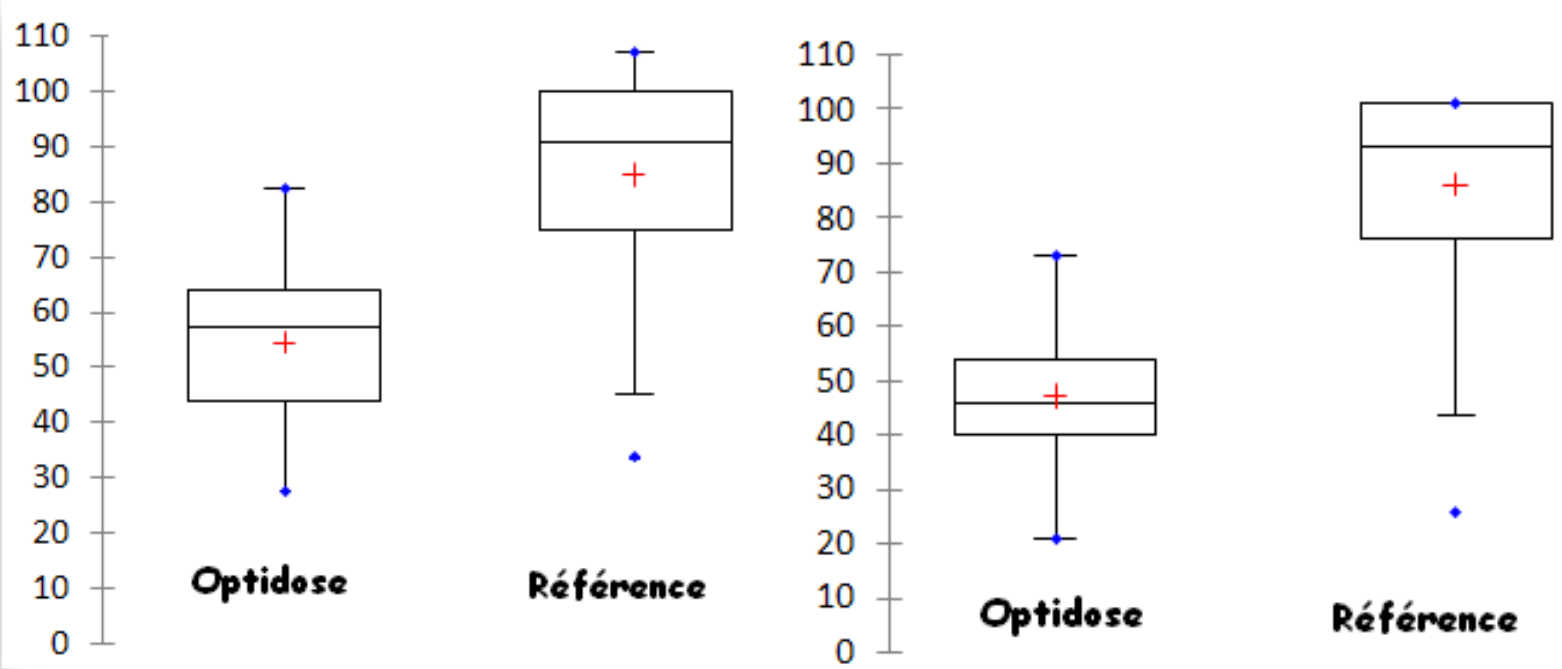


Reducing chemical inputs of **20-50%** (depending on the year)

Average percentage of registered dose applied against

downy mildew **powdery mildew**

(trials from 2002- 2009)



Trials results

Pathogenic virulence

1 – Very low pathogenic virulence

No difference between modalities

Trials results

Pathogenic virulence

1 – Very low pathogenic virulence

2 – Low to moderate pathogenic virulence

Untreated plot is different from over modalities

No difference between Optidose and Reference

Trials results

Pathogenic virulence

1 – Very low pathogenic virulence

2 – Low to moderate pathogenic virulence

3 – Middle to high pathogenic virulence

High severity attack on the untreated plot

The damages observed on Optidose are always higher than those of the modality that has received the registered dose.

The effectiveness of protection remains acceptable

Trials results

Pathogenic virulence

1 – Very low pathogenic virulence

2 – Low to moderate pathogenic virulence

3 – Middle to high pathogenic virulence

4 – Very high pathogenic virulence

4a – Case 1 :

Idem than precedent situation n°3

Trials results

Pathogenic virulence

1 – Very low pathogenic virulence

2 – Low to moderate pathogenic virulence

3 – Middle to high pathogenic virulence

4 – Very high pathogenic virulence

4a – Case 1

4b – Case 2

	Severity of attack on bunches At ripening stage
Untreated plot are destroyed	95 %
Optidose presents important damages	15 à 70 %
Reference doesn't give a perfect protection	7 à 50 %

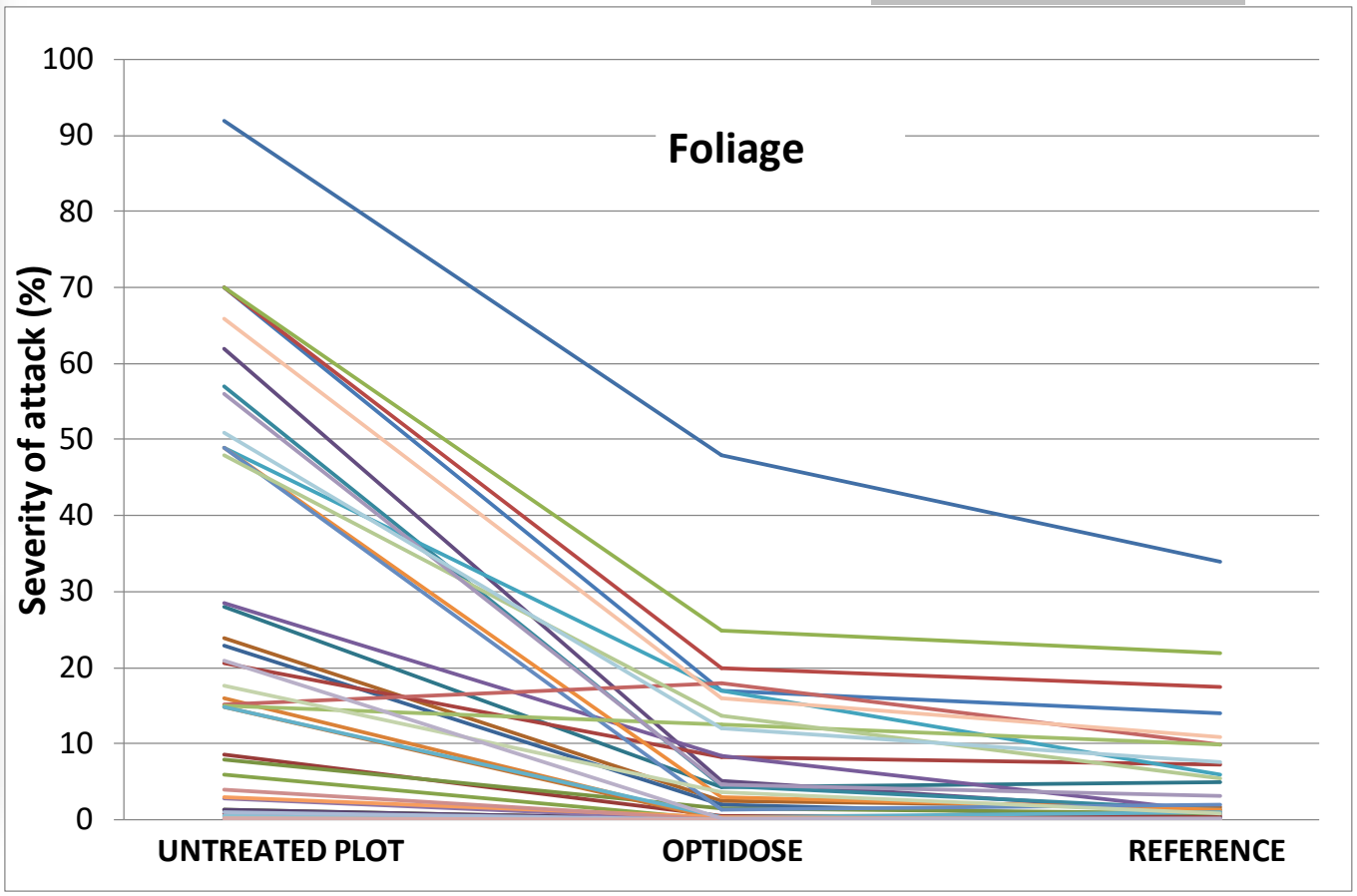
In this case, the dose reduction is not the only problem !

- Position of the treatments regarding to rainfall
- Quality of spray
- …

Trials results

Downy mildew

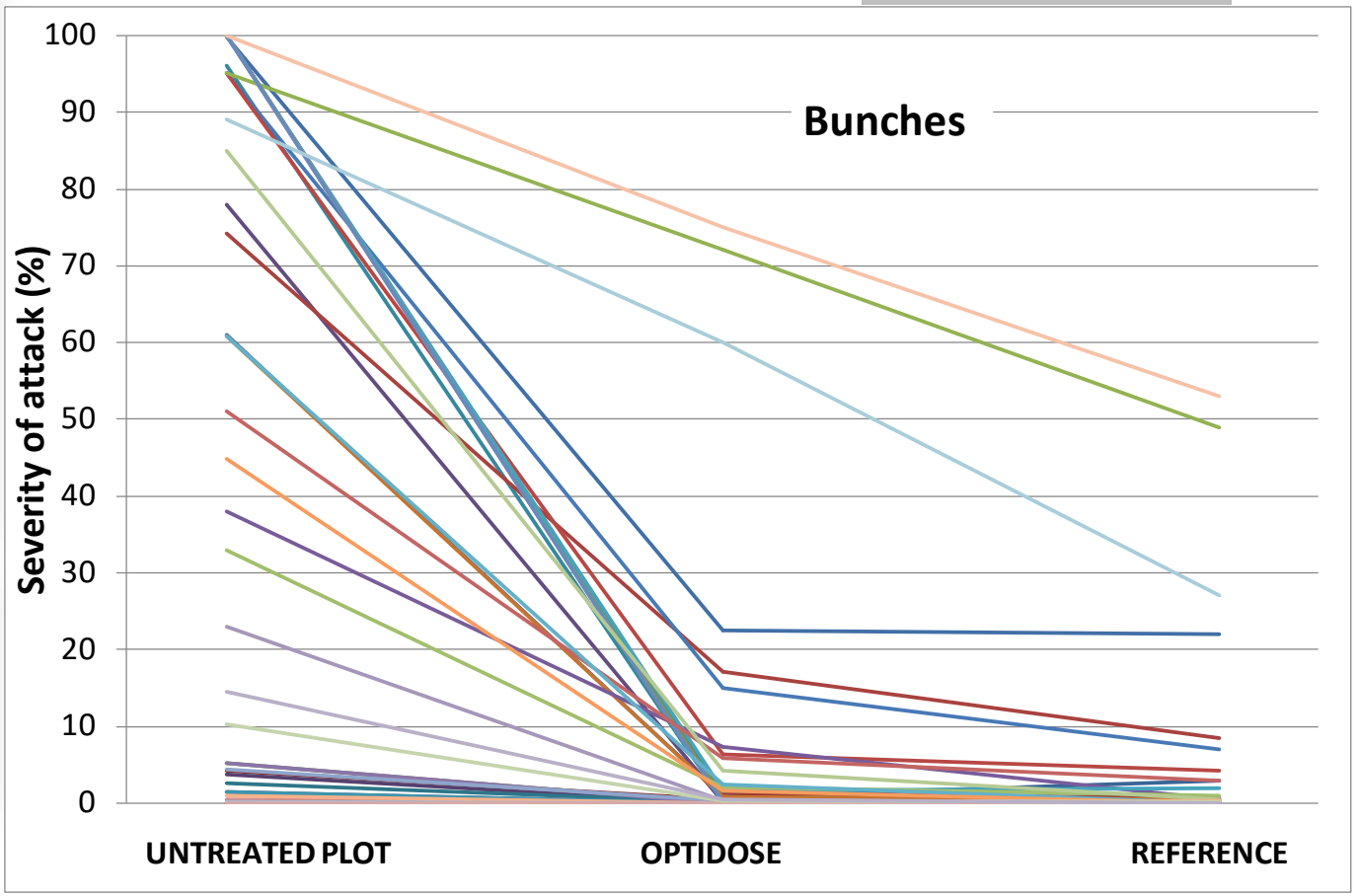
Ripening stage



Trials results

Downy mildew

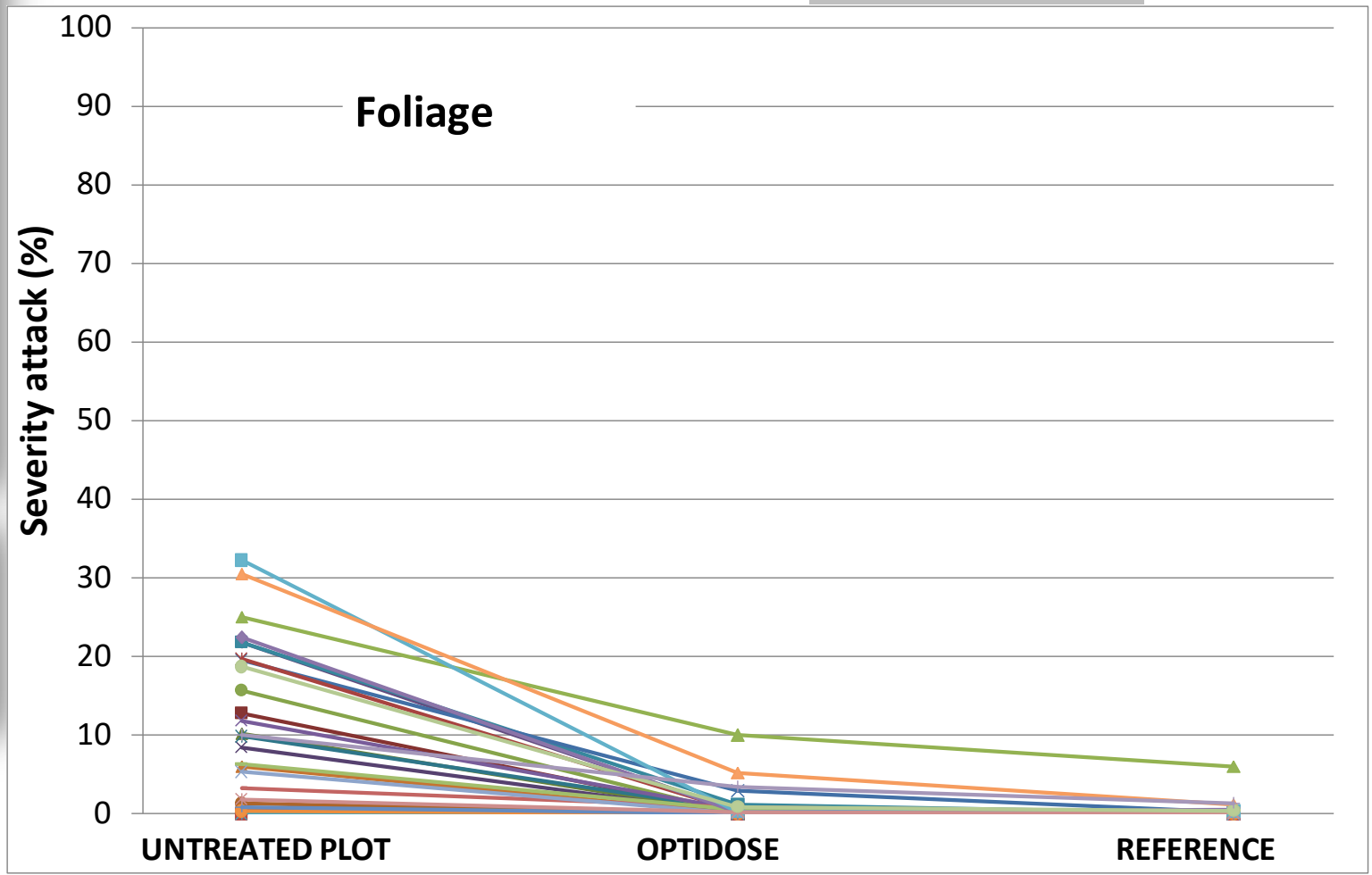
Ripening stage



Trials results

Powdery mildew

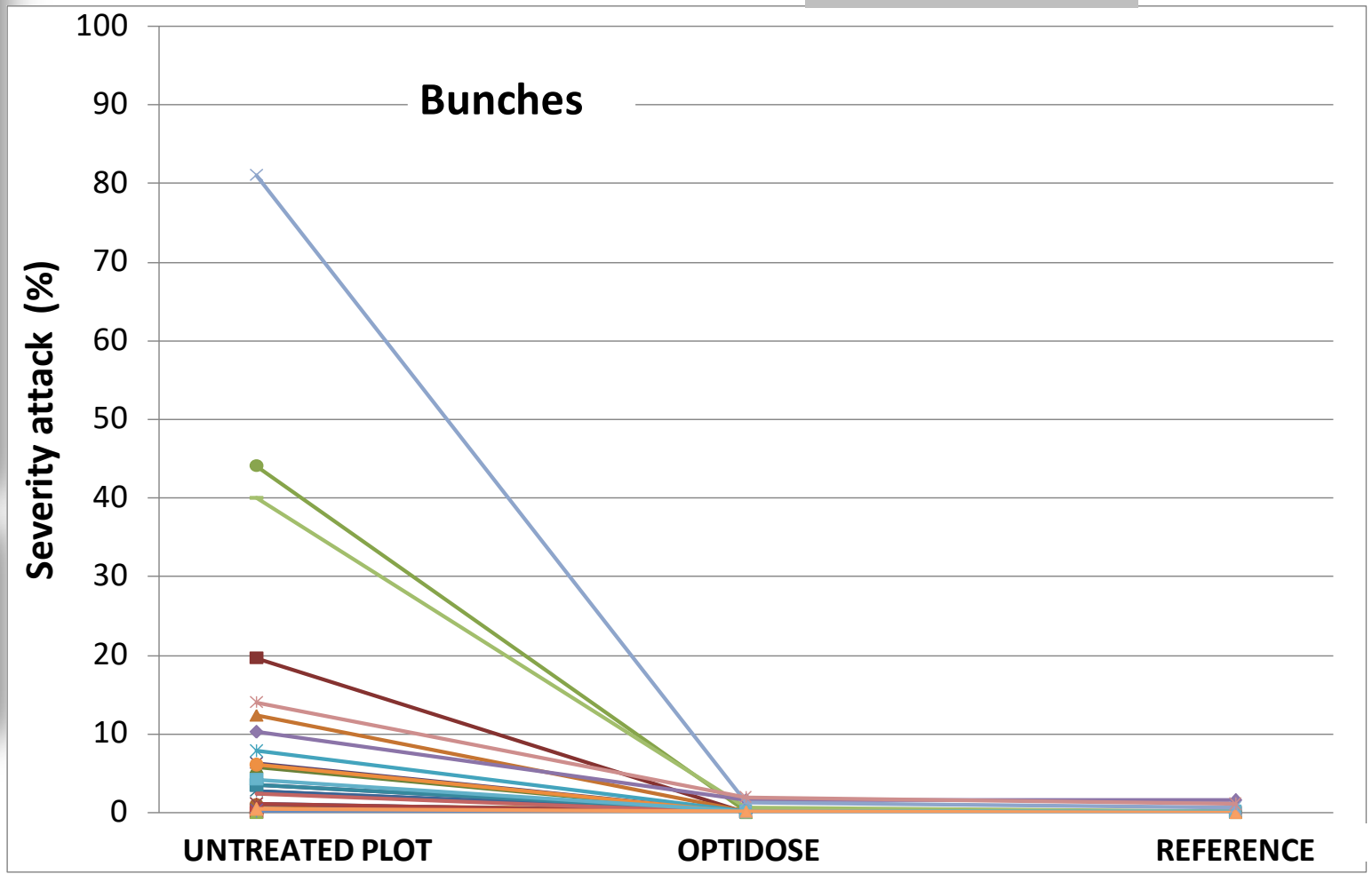
Ripening stage



Trials results

Powdery mildew

Ripening stage



The software Optidose is online for the producers on the website : https://www.vignevin-epicure.com

1 - Risque sur votre parcelle | 2 - Etat de votre parcelle | 3 - Résultats du calcul de doses

Choisissez votre commune pour obtenir une évaluation indicative des risques de mildiou et d'oïdium :

Département : 33 - GIRONDE

Commune : BLANQUEFORT

Distance Centre commune - Point de calcul : **5.6 km**

Date du dernier calcul : **31/10/2018**

1 Risque très faible
2 Risque faible
3 Risque moyen
4 Risque fort

Evaluation du risque de maladies sur votre commune (en fonction des jours)

	Risque calculé avec données météo observées							Risque calculé avec données prévisionnelles							
Maladie	**J-7**	**J-6**	**J-5**	**J-4**	**J-3**	**J-2**	**J-1**	**J0**	**J+1**	**J+2**	**J+3**	**J+4**	**J+5**	**J+6**	**J+7**
Mildiou	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oïdium	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Entrez les valeurs de risque que vous retenez pour chacune des maladies :

Risque Mildiou : Faible

Risque Oïdium : Moyen

Valider mes risques retenus

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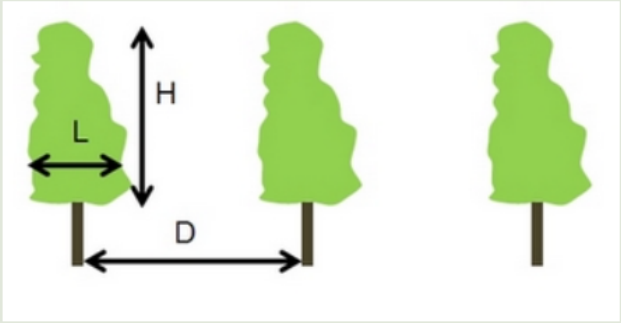
Paramètres de votre vigne

Stade phénologique * : 50-80 % floraison



D - Inter-Rang : *	2	mètres
H - Hauteur de feuillage : *	1.2	mètres
L - Largeur de feuillage : *	0.4	mètres
Volume de haie foliaire (TRV) *	2400	m3/ha

Sensibilité de votre parcellaire au mildiou * : Normal

Sensibilité de votre parcellaire à l'oïdium * : Normal

Valider

The software Optidose is online for the producers on the website : https://www.vignevin-epicure.com

1 - Risque sur votre parcelle | 2 - Etat de votre parcelle | 3 - Résultats du calcul de doses

Paramètres utilisés pour le calcul :

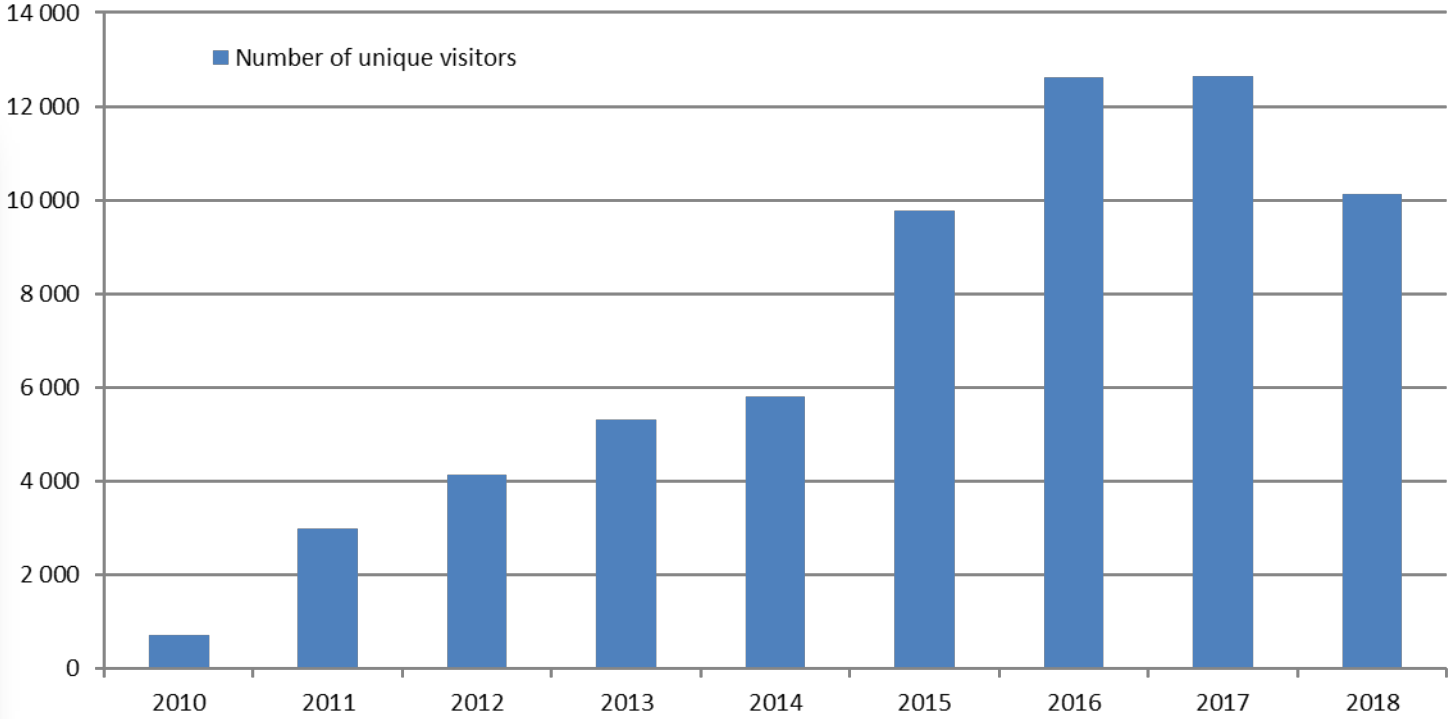
Calcul réalisé pour :	**Vignoble complet**
Région concernée	Aquitaine
Risque ilot/parcellaire retenu mildiou	Faible
Risque ilot/parcellaire retenu oïdium	Moyen
Stade phénologique	50-80 % floraison
Volume de haie foliaire	2400
Sensibilité ilôt ou parcellaire /mildiou	Moyenne
Sensibilité ilôt ou parcellaire /oïdium	Moyenne
Doses à utiliser (en % de la dose homologuée)	
pour le traitement du mildiou :	**60 %**
pour le traitement de l'oïdium :	**70 %**

Obtenir le récapitulatif des calculs au format PDF

Retour à l'accueil

Nouveau calcul

The software Optidose is online for the producers on the website : https://www.vignevin-epicure.com



Votre niveau de satisfaction de l'état sanitaire de votre parcelle à ce stade d'utilisation d'Optidose :

Pour le mildiou

○ Très satisfait ○ Satisfait ○ Plutôt satisfait ○ Plutôt pas satisfait ○ Pas satisfait ○ Pas satisfait du tout

2074 values in 2018

Results of a survey about Optidose® :

Tool number 1 used by farm networks committed to pesticide reduction

Easy to use, useful, pertinent

Not really essential to reason the doses

Wine growers have understood how it works and are able to use it by themselves

Some gaps :

1-Incoherent homologation between countries

The authorized dose of some products can be very different.
What is the “right” dose ?

2-Incoherent homologation of Copper Products

(Still now : 720 to 5000 g/ha of cupper metal)

2018 : Creation of a tool dedicated to copper : Optidose_cuivre
Gives a quantity of metal cupper (g/ha) to be applied

3-Dose evolution over the years

2014 : Polyram 3,5 kg/ha
2015 : Polyram 2 kg/ha

4-Any treatment schedule management

Creation of a DSS : DeciTrait®
It automatically retrieves all the informations needed for decision-making and provides at each winegrower a personalized strategy.

DeciTrait® : A DSS for the vineyard protection

Météo							Mildiou						Oïdium						Black-rot	Botrytis		Commentaires
Date	Pluie Météo France (mm)	Pluie mesurée (mm)	Temp. (°C)	Hygro. (%)	Stade phéno réel	Stade phéno calculé	Etat sanitaire Feuillage (Mildiou)	Etat sanitaire Grappes (Mildiou)	Risque Mildiou	FTA Mildiou (%)	Pluie nécessitant une protection mildiou ?	Protection Mildiou	Etat sanitaire Feuillage (Oïdium)	Etat sanitaire Grappes (Oïdium)	Risque Oïdium	FTA Oïdium (%)	Faut-il être protégé contre l'oïdium ?	Protection oïdium	Protection Black-rot	Faut-il être protégé contre le botrytis ?	Protection Botrytis	Commentaires
20/05/2018	0		18.2	60.21		17			2	0.04772					3	0.08	oui					
21/05/2018	1.7		18.6	68.54		17			2	0.04772					3	0.09	oui					
22/05/2018	0.1		18.38	72.58		18			2	0.04772					3	0.09	oui					
23/05/2018	0.6		19.3	73.83		19			2	0.04772		SILLAGE Cumul pluie: 0.6 mm			3	0.1	oui	PROSPER Cumul pluie: 0.6 mm				
24/05/2018	0		19.41	72.83		19			2	0.04772		0.6 mm			3	0.11	oui	0.6 mm				
25/05/2018	10.9		18.64	86.54		19			2	0.04794	oui	11.5 mm			3	0.11	oui	11.5 mm				
26/05/2018	21.1		18.43	87.04		20			3	0.23217	oui	32.6 mm			3	0.13	oui	32.6 mm				
31/05/2018	0.2		17.3	86.13		23			2	0.23256					3	0.13	oui	40.2 mm				
01/06/2018	0		19.13	77.29		23			2	0.23256		PROFILER Cumul pluie: 0 mm			3	0.13	oui	CIDELY Cumul pluie: 0 mm				
02/06/2018	1.2		20.84	71.96		24			2	0.23256		1.2 mm			3	0.13	oui	1.2 mm				
03/06/2018	0		21.03	75.83		24			2	0.23256		1.2 mm			3	0.13	oui	1.2 mm				
04/06/2018	1		19.28	83.67		25			2	0.23256		2.2 mm			3	0.13	oui	2.2 mm		Pas de traitement		
05/06/2018	4.6		17.3	85.79		25			2	0.23256		6.8 mm			3	0.41	oui	6.8 mm				
06/06/2018	2.6		17.42	87.04		26			2	0.23256	oui	9.4 mm			3	0.41	oui	9.4 mm				
07/06/2018	0.9		19.15	81.21		27			2	0.23256		10.3 mm			3	0.41	oui	10.3 mm				
08/06/2018	0.2		21.4	71.96		27			2	0.23256		10.5 mm			3	0.41	oui	10.5 mm				
09/06/2018	0.9		21.26	73.79		27			2	0.23256		11.4 mm			3	0.41	oui	11.4 mm				
10/06/2018	7.3		20.03	76.79		28			2	0.23256	oui	18.7 mm			3	9.32	oui	18.7 mm				
11/06/2018	3.7		17.75	85.17		28			2	0.23258	oui	22.4 mm			3	12.34	oui	22.4 mm				
12/06/2018	7		17.59	87.17		28			2	0.23313	oui	29.4 mm			3	13.93	oui	29.4 mm				
13/06/2018	0.7		18.79	81.04		29			2	0.3294					3	15.19	oui	30.1 mm				
14/06/2018	2.5		18.19	78.13		29			3	0.3302	oui	MILDICUT Cumul pluie: 2.5 mm			3	15.19	oui	CORAIL Cumul pluie: 2.5 mm				
15/06/2018	1.1		17.24	86.63		29			3	0.3302		3.6 mm			3	15.19	oui	3.6 mm				

Possibility of demonstration during the coffee break...
…or the beer break later :-)))

To conclude…

Decisions rules proposed in **Optidose®** allow to reduce the use of fungicides

Reference ----------(- 35% fungicides)----------> Optidose ®

Low efficiency decrease

DeciTrait® : a complete DSS for the vineyard protection

- dashboard very easy to use
- facilitates the development of Optidose
- go further (or to secure) in the reduction way of pesticide

⚠ Fungicide reduction = reduction of the safety margins !

It requires being precise, vigilant and responsive

Thank you for your attention !

Acknowledgment

IFV INSTITUT FRANÇAIS DE LA VIGNE ET DU VIN

RÉGION Nouvelle-Aquitaine

ÉCOPHYTO RÉDUIRE ET AMÉLIORER L'UTILISATION DES PHYTOS

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MINISTÈRE DE L'AGRICULTURE DE L'AGROALIMENTAIRE ET DE LA FORÊT

To answer your question about the risk of generating resistant strains…

Most of the fungicides used against downy mildew are associated with a contact product

We recommend using an efficient sprayer

Registered dose but under dosing in one case !

If it was the explication of generating resistant strains, a lot of sprayers should be forbidden because even if you use the full dose into the tank, you won't apply it correctly !!!

Resistance management goes through :

-controlling the number of applications
-alternation of fungicide's families
-use an efficient sprayer