



Preventive and curative efficacy of Ostrinil[®] against the Palm Borer *Paysandisia archon* (Burmeister, 1880)

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Natural Plant Protection

Studies realized in partnership with

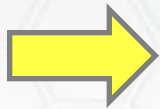
VEGETECH

Context of the study

2 protagonists

- ❖ **VEGETECH** (La Crau, 83, France)
Knowledge on the behaviour of *Paysandisia archon*,
rearing and field trials
- ❖ **NATURAL PLANT PROTECTION (NPP)** (Pau, 64, France)
Biotechnology company
Subsidiary of Arysta LifeScience group

Development and manufacture of biopesticides



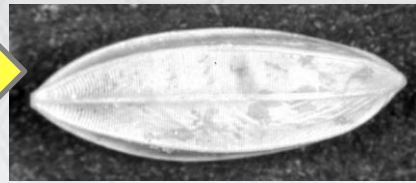
Creation of an Economic Interest Group
called “Health of Ornamental Plants”

Research and development of biological methods to control pests of
ornamental plants that preserve environments and humans



Presentation of the palm borer, *Paysandisia archon*

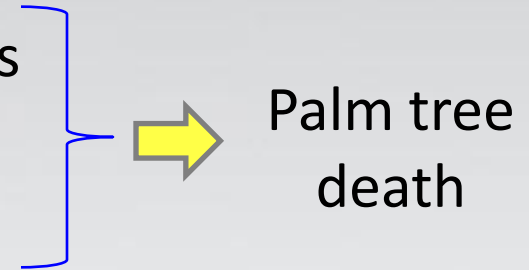
- ❖ Castniidae Lepidoptera coming from Argentina
- ❖ Host plant : *Tritrinax campestris*
- ❖ Recorded in France on 21 palms species since 2001
- ❖ Borer insect which realizes its cycle on 1 to 3 years



Presentation of the palm borer, *Paysandisia archon*

Main symptoms on palm trees

- ❖ Galleries in the trunk and perforations of palms
- ❖ Sawdust caps
- ❖ Abnormal palm trees deformation



Product presentation

Ostrinil®

***Beauveria bassiana* 147 strain spores based biological insecticide**

- ❖ Microgranule formulation
- ❖ $5 \cdot 10^8$ spores / g of dry substrate
- ❖ Registered in France since 1993
- ❖ Major use : Control of the European Corn Borer, *Ostrinia nubilalis*
- ❖ Use extension demanded in 2008 for the control of *P. archon* on palm trees



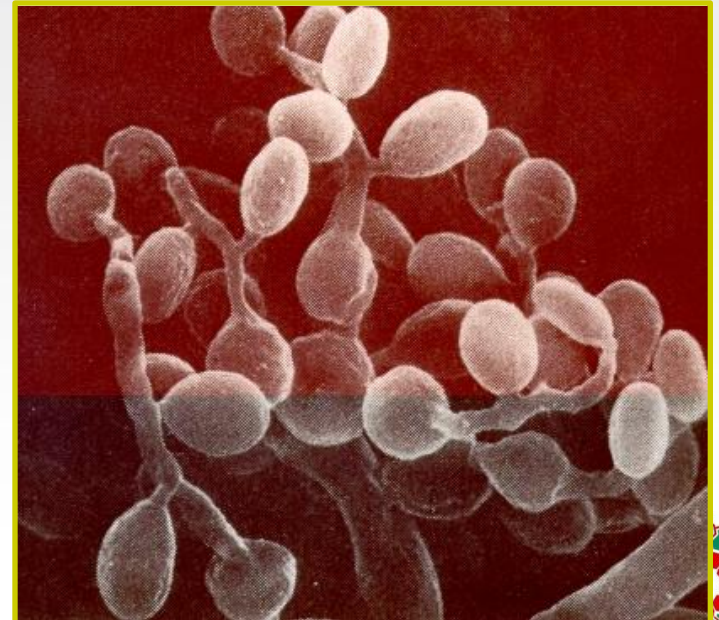
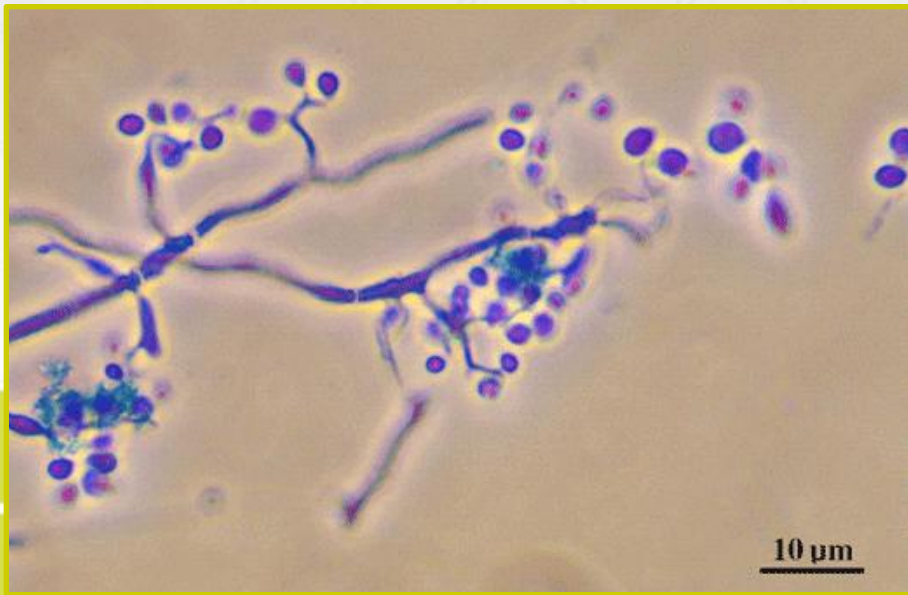
Dossier studied by the French Agency for Food Safety but a derogation was accorded for 120 days by the French Minister of the Agriculture (until the 28th of October)

N.P.P.



The fungus *Beauveria bassiana*

- A filamentous fungus
- Cosmopolitan species frequently isolated in ground
- Causes diseases in insect known as “white muscardin”
- Not pathogenic for humans and hot blood animals
- Spores act by contact with the insect



The fungus *Beauveria bassiana*



European Corn Borer (*Ostrinia nubilalis*) larva infected by the *Beauveria bassiana* 147 strain



Ostrinil® efficacy trials on *P. archon*

Tests initiated in 2005 by NPP and Vegetech under financial support of the city of Hyères-Les-Palmiers (83)

❖ Tests in laboratory

Efficacy of the *Beauveria bassiana* 147 strain on *Paysandisia archon* eggs and larvae too

❖ Natural conditions trial

Efficacy of the *Beauveria bassiana* strain at 2 levels



Important larvae mortality (~ 80 %)



Induction of a development delay in survival larvae



Ostrinil[®] efficacy trials on *P. archon*

Paysandisia archon egg
infected by the *Beauveria
bassiana* 147 strain



Paysandisia archon larva
infected by the *Beauveria
bassiana* 147 strain

GEP trial in 2007

Set up by the Scradh (Hyères, 83, France) in natural conditions

- ❖ On *Phoenix canariensis* palm trees
- ❖ Treatments every 14 days at the dose of 56 g of Ostrinil[®]/ palm tree
- ❖ Palm trees infestations with eggs or neonate larvae every 7 days
- ❖ Dismantling of palm trees crown by crown 39 days after the first treatment in order to isolate death or survival larvae



GEP trial in 2007

Results

➔ Very good preventive efficacy of Ostrinil[®] against *Paysandisia archon*

	Attacks rate	Efficacy
Control	86,7%	
Ostrinil	3,8%	95,6%

➔ Microgranules formulation well adapted for the palm trees treatments

Good penetration of Ostrinil[®] between the rachis

➔ No negative impact of Ostrinil[®] on the palm tree insects wildlife



GEP trial in 2007



Beauveria bassiana infected larvae after palm trees treatment with Ostrinil®



2 years-trial in a voluntary palm trees nursery

- ❖ Trial set up in a nursery in 2007 and 2008
- ❖ On 286 *Chamaerops humilis* and 155 *Phoenix dactylifera*
- ❖ Under *Paysandisia archon* natural infestation
- ❖ Control on 25 % of the total number of palm trees



Inventory of the nursery before the start of the trial

Symptoms severity: healthy, infected, strongly infected

- ❖ All palm trees are preventively treated
- ❖ Infected palm trees are treated in a curative way too



2 years-trial in a voluntary palm trees nursery



2 years-trial in a voluntary palm trees nursery

Preventive treatment

- ❖ 28 g of Ostrinil® / palm tree on *Chamaerops humilis*
- ❖ 42 g of Ostrinil® / palm tree on *Phoenix dactylifera*
- ❖ Treatment every 14 days by manually sprinkling of the palm tree crown during the adult flight period (from June to September) each year

Curative treatment

- ❖ One shot treatment in 2007 at the beginning of the trial
- ❖ 70 g of Ostrinil® / palm tree on each species by trunk injection in larvae galleries

Notations

	September 2007	February 2008	July 2008	October 2008
<i>Chamaerops humilis</i>	x	x	x	x (Not available)
<i>Phoenix dactylifera</i>			x	x (Not available)

2 years-trial in a voluntary palm trees nursery

Results

At the beginning of the trial

❖ Homogeneous modes

Chamaerops humilis

	Healthy	Infected
Control	52,10%	47,90%
Treated	54,00%	46,00%

Phoenix dactylifera

	Healthy	Infected
Control	46,20%	53,80%
Treated	38,80%	61,20%

As many infected palm trees in the control as in the treated parcel



2 years-trial in a voluntary palm trees nursery

Results

In July 2008

❖ *Phoenix dactylifera*

For treated palm trees, in comparison with the control

 Less active attacks

	Control	Treated
Active attacks	0,21 attack / palm tree	0,59 attack / palm tree

❖ *Chamaerops humilis*

- With Ostrinil[®], 74 % of the attacks are aborted
- In the control, 100 % of the attacks are active

	Control	Treated
Active attacks	100,00%	26,00%
Aborted attacks	0,00%	74,00%



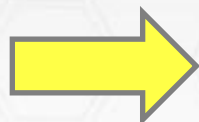
2 years-trial in a voluntary palm trees nursery

Results

In July 2008

❖ *Efficacy of Ostrinil® on Chamaerops humilis*

	September 2007	February 2008	July 2008
Control attacks rate	100,00%	100,00%	100,00%
Treated attacks rate	16,70%	12,30%	15,00%
Efficacy	83,30%	87,70%	85,00%



Efficacy between 80 % and 90 % under natural infestations



2 years-trial in a voluntary palm trees nursery

Conclusion

- ❖ Confirmation of the very good potential of Ostrinil® for the control of *Paysandisia archon* in a situation of natural infestation
- ❖ Last results on the curative treatment are not available yet but they are very promising
 - Good palm trees regrowth
 - New palms are safe without perforations
 - In 2008, it has been necessary to trim palm trees 2 times during the trial



Researches and development

Collaboration between NPP and Vegetech goes on

- ❖ Carrying on with the researches on *Paysandisia archon*



Last notation on the 2-years trial



Results of the trial set up in 2008 on 2 other species
Trachycarpus fortunei and *Washingtonia filifera*

Ostrinil® use extension attended for 2009 in France

- ❖ Beginning of the researches on the Red Palm Weevil,
Rhynchophorus ferrugineus



Candidates will be tested with results hoped for the next spring





Thank you for your attention



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