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The Red Palm Weevil of the palm trees

1. The Red Palm Weevil (RPW) of the palm trees represents a major threat for many Species of palm trees the (RPW) of palm trees (RHYNCHOPHORUS FERRUGINEUS)

Plantations of palm trees of l' Asia and of Mélanésie. It reached the Middle East and the Mediterranean basin in the middle of the years 1980 when it is propagated quickly by posing the large ones Problems of management. It is identified in the South-east of France since semi-2006. The palm tree coconut (Coconuts will nucifera L.) represents the species on which curculionidé causes the economic Damage most important, but of many Arecaceae can be Attacked inter alia Areca catechu, Arenga pinnata, Borassus flabellifer, Brahea armata, Butia Capitata, Calamus merillii, maximum Caryota, Caryota cumingii, Chamaerops humilis, Coconuts Nucifera, Corypha gebanga, Corypha elata, Elaeis guineensis, Livistona australis, Livistona Decipiens, Metroxylon sagu, Oreodoxa regia, Phoenix canariensis, Phoenix will dactylifera,



Phoenix Theophrasti, Phoenix sylvestris, Sabal will umbraculifera, Trachycarpus fortunei and Washingtonia spp. The Killer of palm trees, like l' species was baptized, contaminates since October 2006 the VAR. This Ravageur is much more frightening than Paysandisia archon, another vermin of the palm trees, which has been Installé



for already a few years in the south of Europe. The primary symptoms of CRP appear only well after the beginning of infestation, the strongly attacked trees lose the Totality of their palms and die after the complete rotting of the trunk. All them Littoral communes as well as the professionals of the die are mobilized in the fight against this invasion. (See additional united). Wikipedia source 2. There to date does not exist really effective treatment Preventive medication: Two chemical active substances are usable with preventive measure, Bifenthrine and Lambda.

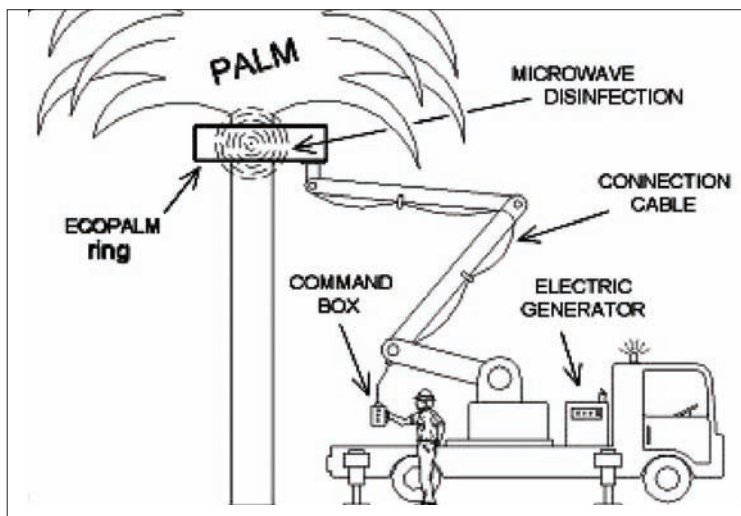
Cyhalothrine but their effectiveness is prone to polemic as for all the pesticides. Curative treatment: The only effective solution is the destruction and the incineration of the infested palm tree. 3. The stakes are important The threat of the red charançon represents an environmental and economic stake Important (tourist, patrimonial, sedentary, even food for the countries of North Africa) in all the affected regions. The health authorities and agricultural are mobilized on all the levels: European Union, States, area, departments, communes and dies 17 million palm trees in Algeria (source El watan •professional Some figures 4,2 million palm trees in Morocco (source Such as it is •January 21, 2009) ... • 50 000 palm trees in the maritime Alps. •Morocco - census 2003)

4. The revolution Eco palm ECOPALM is a technology microwaves patented by the company Bi. It S.r.l to fight and Destroy the red charançon (Rhynchophorus

ferrugineus) and the xylophagous insects in all its Phases of development, directly on the palm tree, even when the trunk is already large. The microwaves penetrate in the woody mass. The microwaves interact by creating vibrations and a heating of the water molecules which

compose the majority of the matters Organics, including those of the parasites. Overheating and l' hyperthermia makes it possible to destroy these Organizations some is the stage of their development (eggs - larvae - nymphs - adults). The lethal Temperature of the xylophagous





insects at any stage of their development varies 53°C with 57°C.

ECOPALM is a powerful industrial instrument with microwaves for the disinsectisation of the trees in Growth. It is fast to install and effective against the biological moulds, bacteria, insects and Parasites, without damaging the tree. Treatment ECOPALM is ecological. It is an alternative to all the other methods of fight, because it does not use chemical chemicals nor of methods. By using an energy with ultra High frequency, it respects the environment and the health of the citizens. The treatment with ECOPALM is very fast and times of desinfection are very short. Treatment ECOPALM is clean, because it does not leave harmful residues or poisons during and afterwards

The use. Treatment

ECOPALM is without danger to the operators and the citizens, and can thus be used in the public places and deprived. Treatments ECOPALM are with preventive measure on effective at 100% because they can be used: on a purely curative basis of the healthy palm trees with ECOPALM BOXING RING like method of elimination of the trees contaminated with ECOPALM BOXING RING irremediable trees with ECOPALM BOX

5. Principles of operation of ECOPALM BOXING RING ECOPALM BOXING RING is a circular machine, equipped with electric generators of microwaves which emit energy with very high frequencies. The machine is equipped with segments whose opening and closing make it possible to encircle the trunk and the heart of the palm tree for an in-depth treatment. Machine ECOPALM BOXING RING is installed and assembled quickly on a mechanical arm or the arrow of a crane equipped beforehand with electric cables, of a control panel and a diesel generator of electric current. The ECOPALM BOXING RING is mobile, easily transportable on the site of desinfection. It is usable in the middle of the vegetation, including for trees of high size, without harming the plant nor with the environment or the people. ECOPALM BOXING RING can



remain in l' tree. No known Treatment is to date completely effective. L' objective of treatment ECOPALM is to safeguard the tree even when it is infested in Éradiquant *Rhynchophorus ferrugineus*. The microwaves penetrate the various layers of wood and where they strike the eggs, the cocoons of chrysalis and all the other parasites, which are completely destroyed. ECOPALM guarantees Désinfestation total of any harmful organization. Duration of the treatment: 40 minutes/palm tree. Duration of protection higher than one year.

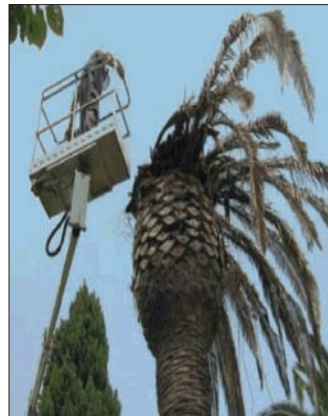
be used as preventive method or of care of infested palm trees.

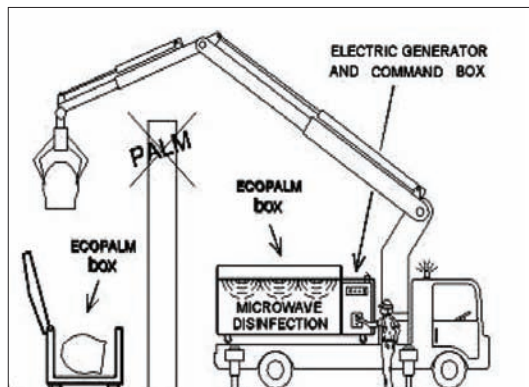
6. Preventive medication on healthy palm tree with a ring ECOPALM BOXING RING After the size of the slings, the branches which remain on the palm tree have a rate d' moisture high which Supports the propagation of the mould and of bacteria which release from the olfactive molecules whose typical odor attracts the red charançon. The palm tree thus becomes particularly exposed with the Attacks and the installation of the coleopters. Under the natural conditions, it takes several months for a palm tree to cure size and to dry the moisture caused by the mould and the bacteria. After cut of the slings, treatment ECOPALM microwaves is essential to eliminate it Problem, because it sterilizes in a few minutes the surface of the trunk by eliminating the moulds, the Bacteria and the rot. It accelerates the cure thus. This preventive medication has a durable effect, because it allows l' bark to dry quickly. The bark Becomes then more difficult to penetrate and the insects cannot attack it nor to settle there.

. Duration of the treatment: 20 minutes/ palm tree. Duration of protection higher than one year. 7. Curative treatment on palm tree infested with a ring ECOPALM BOXING RING This method is particularly effective when the palm tree was attacked by the red charançon Some is the stage of colonization by the parasite:

adult coleopters. At this stage, it is • cocoon • chrysalis, • larva, • difficult of éradiquer completely the vermin by using chemical methods. Let us charançons red are in particular difficult to reach with the plant health treatments, When the chrysalis is in its cocoon (very protective) at the stage of preparation of Metamorphose or for the long period during which the larvae

8. Principles of operation of ECOPALM BOX ECOPALM BOX is a closed and mobile container equipped with electric generators of microwaves in Très high frequency. Any material placed at l' interior of the room is decontaminated in a Totale way and fast. Container ECOPALM BOX is installed and assembled quickly on any vehicle designed for Transport of buckets.





Duration of the treatment: 1 hour/palm tree 10. Some examples of treatment Palm tree tackled - a hole - Control of temperature and noise.

ECOPALM BOX is already equipped with a diesel electric generator and a control panel. It can function independently on traffic moving or stationed on the place of the desinfestation. ECOPALM BOX is conceived for the disinfection of the palm trees directly on the site of demolition. It makes it possible to completely disinfect the sheets and the trunk placed inside

the room, with a total Safety for the environment, without danger to the people and risk of dispersion of the coleopters .

9. The disinfection of the irremediable palm trees with a container ECOPALM BOX before their Destruction The use of this method of treatment ECOPALM is essential in the phase d' avancée attacks

when the palm trees are not recoverable any more. The system is useful to disinfect the tree and éradiquer on the spot the red charançon whatever the stage of its evolution. After this treatment, the palm trees are completely disinfecté and can be eliminated in full safety, without not being more regarded as "dangerous waste". During the treatment by microwave, the principal effects are localised on l' bark of the palm tree, Where the cocoons with chrysalis are. L' energy of the microwaves goes the éradiquer completely by Blocking their evolution and by preventing them from becoming adult coleopters. No other known Method makes it possible to arrive to such a result, which stops the life cycle of the coleopter definitively.

ATTACKS IN THE MIDDLE OF THE PALMIE



Before the treatment



Treatment with Ecopalm



60 days after the treatment

OBVIOUS ATTACK OF CHARANÇON RED



RESULT AFTER TREATMENT ECOPALM

The red charançon is with our doors Danger of died of the date palm The charançon, this larva from 2 to 2,5 cm length, is a threat for the palm tree. In Europe, it made devastations obliging several communes of the south of France to burn Whole alleys of palm trees. Even topo in Spain. Today, it is at our borders (terrestrial) and already gained Morocco... That risks it Algerian palm tree? What the red charançon? Worse than Bayoud Algeria counts some 17 million palm trees on some 750.000 ha. That it is purely decorative or date palm, the palm tree is by far the tree most present and represented in Algeria. Up to now, the Algerian palm tree went well. Washingtonias of the Garden of tests continue to reflect itself in the mirrors of the French garden and the phoenixes canariensis of Bab Ezzouar accompany the vehicles active with the airport. Certain diseases can attack the palm tree, but of the treatments exist, and, up to now, the cases are isolated without risk from Contamination with large scales. In 2005, the palm plantation of Ghardaïa had had to suffer mainly of





Palm tree 60 days after the treatment Test on a palm tree attacked with the foot and counting of the results of treatment ECOPALM



the caterpillar of date and boufaroua, obliging the treatment of 161.286 Palm trees on the 13 communes of the wilaya and consistent in pulverization on the palm trees Contaminated of a powder called dimilin for the bee moth (caterpillar) and of an acaricide for Boufaroua. Bayoud is also a mushroom against which Algeria had to act for to save its palm plantations.

The research laboratory on the arid regions, located at the FAC power station From Algiers, year last succeeded to obtain protoplasts of palm tree having to develop Future palm trees having gustatory qualities of the deglet noor and the resistance of the takerbucht. Lastly, it is still necessary to wait to decide, but ici-là, another evil could well in to finish

with the palm plantations of the South if no serious precaution is taken. In Europe, Charançon was quarantined on decision the European commission, but that does not have Pas is enough. All the country of the Mediterranean circumference is infested by the charançon. And Today, it was located in Tangier in a hotel of Morocco. Bayoud had gained Algeria by Morocco here is approximately a century.

Identification of the threat its denomination:

rhynchophorus ferrugineus. It was announced on the palm tree to oil then on the Date palm and is originating in the tropical zones of Southeast Asia and Polynesia. It is in 1995 Qu ' it is pointed out following the damage which it caused in the south of Spain. Today, its presence contaminated the totality of the Varois littoral, the Rhone delta and the Alpes-Maritimes in France. The difficulty with the charançon is that, to get rid some, it is necessary To remove from the contaminated palm tree. While majority of the diseases affecting the palm trees Can be dammed up by a chemical action or biological, the red charançon calls some With physical measurements against the palm tree. The reason rests on the fact that the cycle of it Ravageur is held inside the plant, in the palm. It is thus recommended to cut down the palm trees contaminated by incineration or fine crushing in order to avoid the emergence of Adultes insects and the contamination of the surrounding palm trees. Vis-a-vis its extreme measurements, sound Importation must be completely suspended the more so as it is possible to have palm trees, Soit par insémination in vitro (if the order is done in advance), that is to say by preserving those which Are torn off in the passing of a new road (ex-Hamadi where ten palm trees were Abattus for the passage of the East-West motorway) for purposes to transplant them on another site. As a recall, the palm tree has a system racinaire allowing an easy transplantation which require some



average materials, but whose chances of success are proven. "If the charançon arrives, finished of them date palm in Algeria and our oases" Specialists in the date palm, worrying on arrival of Red Charançon at our borders with Morocco In what the threat of the red charançon is it serious? It should be known that the red charançon is described as killer of palm trees. He decimates a great Number of species of palm trees of which the date palm. The problem is that there does not exist any Préventif remedy. Worse, if it is located, the only alternative consists in destroying the palm tree. It can Détruire all the palm plantations of the South if it were to be introduced. Today, the threat is very Sérieuse because the red charançon was located in Tangier, in Morocco. All the Mediterranean countries have been touched for several years: France, Spain, Italy, Turkey, Saudi Arabia, the Maghreb was so far preserved but for How long still? Is the threat as serious as for Bayoud?

It is worse than for Bayoud which, it, attack only the significant varieties of date palms, which preserves a certain inheritance nevertheless, that of the resistant varieties. Moreover, Même if so far no effective remedy could be born, it is allowed to think that the genetic fight can, if not the éradiquer, at least to thwart it. In this context, our Team developed the technique production of protoplasts (cells deprived of Wall) starting from a resistant variety (takerbucht) and of another sensitive but of good quality date palm (Deglet Nour). This technique allows the fusion of these 2 types of protoplasts In order to obtain hybrids of date palms which combine at the same time date palm quality and resistance To Bayoud. That took eight years of research, but we are only in the world with to have developed technique at a family of very difficult plants that are them Palm trees. It should now be waited until the seedlings obtained grow, give fruits to know if they are somatic hybrid truths.

WHICH SOLUTIONS DO YOU RECOMMEND.

It is absolutely necessary to stop importing palm trees. Then it is necessary to control those already imported like those of the park of the High winds. Then, it is necessary to envisage an alarm system making it possible to locate a hearth and éradiquer thus the charançon before it is propagated. It is all the more damage which, thanks to the PNDA, the Algerian palm plantation renovated. We passed From 9 to 17 million palm trees in a few years hardly. All these efforts would be vain if Charançon had suddenly passed our borders. It is necessary 10 years so that a palm tree starts To give dates and more so that the production is consequent... Bayoud also had Passé here is the borders of Morocco a century. It is only today that one starts To hope. With the charançon, there is no means of fight and its propagation is extremely Facile.