



## ECOPALM in 10 points

### 1. The Red Palm Weevil represents a major threat for numerous species of palms

Palms around the world are ruthlessly attacked and damaged by the **Red Palm Weevil** (RHYNCHOPHORUS FERRUGINEUS). It targets coconut, date, oil and other palms causing great economic loss to the growers. In some countries it not only causes direct losses but also transmits diseases as a vector of dreaded red ring disease in oil palm in Latin American countries. It has reached Middle East and the Mediterranean basin in the mid 80's, where it has been propagating itself quickly while posing big problems of management. It is identified in the Southeast of France since mid -2006.



The coconut palm (*cocos nucifera*) represents the species on which the curculionidae causes the most important economic damages, but many other *Arecaceae*s can be attacked, among others: *Areca catechu*, *Arenga pinnata*, *Borassus flabellifer*, *Brahea armata*, *Butia capitata*, *Calamus merillii*, *Caryota maxima*, *Caryota cumingii*, *Chamaerops humilis*, *Cocos nucifera*, *Corypha gebanga*, *Corypha elata*, *Elaeis guineensis*, *Livistona australis*, *Livistona decipiens*, *Metroxylon sagu*, *Oreodoxa regia*, *Phoenix canariensis*, *Phoenix dactylifera*, *Phoenix theophrasti*, *Phoenix sylvestris*, *Sabal umbraculifera*, *Trachycarpus fortunei* et *Washingtonia* spp.

The Palm Killer, as the species has been nicknamed, has been contaminating the south-eastern part of France since October 2006. This devastating pest is a lot more dangerous than the *Paysandisia archon*, another harmful pest, already known for years in the south of Europe. The first symptoms of the RWP only appear long after the beginning of the infestation. The attacked trees lose the totality of their palms and die after the complete deterioration of the trunk. Coastal local communities as well as professionals are mobilized to struggle against this invasion. (See attachments).

Source Wikipedia

### 2. There is no really efficient treatment

#### Preventive treatment:

Two chemical substances are used as a preventive measure, the Bifenthrin and the Lambda Cyhalothrin, but their effectiveness is subject to controversy as for all pesticides.

#### Cure treatment:

The only efficient solution is the destruction and the incineration of the infested palm.



### 3. The stakes are very high

The threat of the red palm weevil represents an important environmental and economic stake (tourism, heritage, security, or even food for the countries of North Africa) in all affected regions.

The sanitary and agricultural authorities are mobilized at all levels: European Union, states, regions, local communities and the agricultural sector.

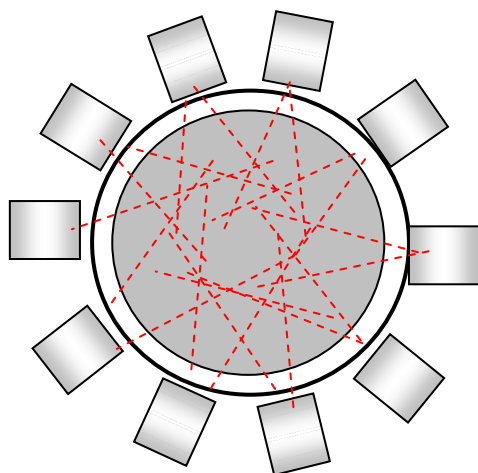
Some figures

- 17 million palm trees in Algeria (source El watan 21 January 2009)
- 4,2 million palm trees in Morocco (source Tel Quel Morocco–2003 census)
- 50 000 palm trees in the French « Alpes maritimes » region.
- ...

### 4. The Ecopalm Revolution

**ECOPALM** is a microwave technology patented by the company Bi.elle Srl to fight and destroy the red palm weevil (*Rhynchophorus ferrugineus*) and wood-eating insects in all stages of development, directly on the palm tree, even when the trunk is already big.

Microwaves penetrate the wood mass. They interact creating vibration and heating the water molecules that make up most organic materials, including those of parasites. Overheating and hyperthermia are used to destroy these living organisms, whatever their stage of development (eggs - larvae - pupae - adult). The lethal temperature of wood-eating insects at any stage of their development varies from 53 ° C to 57 ° C.



**ECOPALM** is a powerful industrial microwave device for disinfection of the growing trees. It is quick to install and effective against fungi, bacteria, insects and biological pest without damaging the palm tree.



**ECOPALM** is environmentally friendly. This is an alternative to all other methods of struggle against pest, because it uses neither chemicals nor chemical methods. The use of ultra high frequency energy respects the environment and the health of citizens.

The **ECOPALM** treatment is very fast and the disinfestations time is very short.

The **ECOPALM** treatment is safe and clean, because it leaves neither harmful nor toxic residues during and after use.

The **ECOPALM** treatment is safe for operators and for citizens. It can therefore be used in public and private places.

**ECOPALM** treatments are 100% effective because they can be used:

- as a **preventive treatment** for **healthy palm** trees with **ECOPALM RING**
- as a **curative treatment** for **infected palm** trees with **ECOPALM RING**
- as method of **elimination** of the **unrecoverable palm** trees with **ECOPALM BOX**.





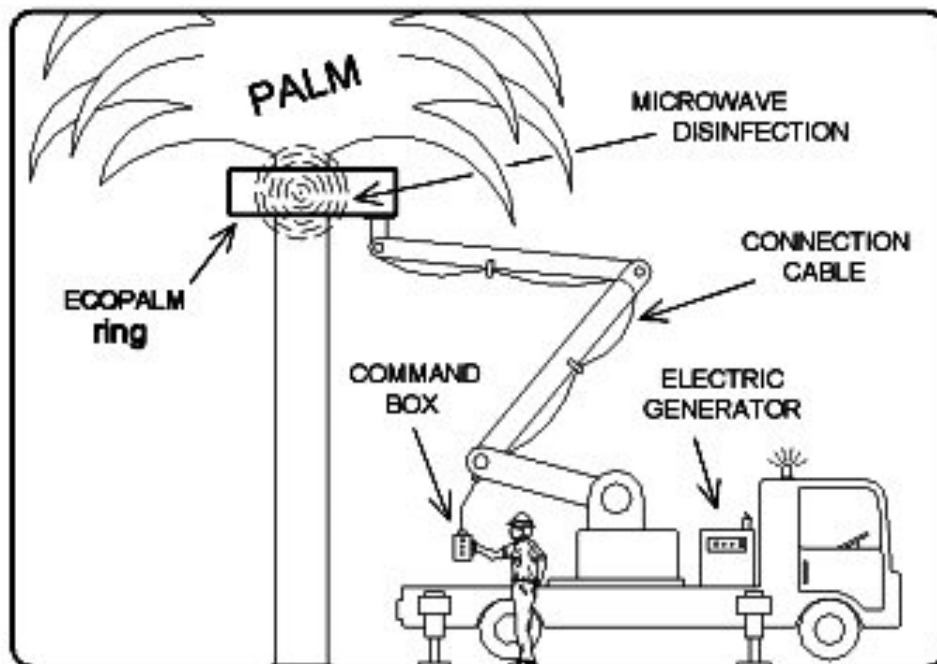
## 5. The operating principles of ECOPALM RING

ECOPALM RING is a circular device, equipped with electrical microwaves generators that emit energy at very high frequencies. The device is equipped with segments that can be opened and closed around the trunk. The surrounding of the trunk and of the heart of the palm tree allows a treatment in depth.

The ECOPALM RING device is installed quickly and mounted on a mechanical arm or on the boom of a crane previously equipped with electric cables, a control panel and a diesel generator.

The ECOPALM RING is mobile, easily transportable to the place of disinfection. It can be used at the heart of vegetation, in all situations, including for tall trees, without harming the plant, the environment or people around.

RING ECOPALM can be used as a preventive method or as a care of infested palms.





## 6. **Preventive treatment of healthy palm trees with ECOPALM RING**

After pruning the fronds, the branches that remain on the palm tree have a high rate of humidity which encourages the spreading of fungi and bacteria. These bacteria emit olfactory molecules that attract the red palm weevil. Palm trees are therefore particularly exposed to the attack and settling of these beetles.

In natural conditions, it takes a palm tree several months to heal from pruning and dry out the humidity caused by mould and bacteria.

After cutting off the fronds, the ECOPALM microwave treatment is essential to eliminate this problem, sterilizing the trunk surface from mould, bacteria and rot in just a few minutes and encouraging healing.

This preventive treatment has a long-lasting effect, since it causes the bark to dry out quickly. The beetles cannot attack the bark, penetrate and settle any longer inside the trunk.



Duration of the treatment: 20 minutes/palm tree.

Duration of protection of more than one year.





## 7. The curative treatment on infested palm trees with ECOPALM RING

This method is particularly effective when the palm tree has been attacked by the red palm weevil in whatever stage the parasite has colonised the tree, be it

- larva,
- pupa,
- cocoon or
- full-grown weevil.

At this stage it is difficult to totally eradicate the beetle using traditional chemical methods, especially when the pupa is in its cocoon (highly protective) preparing for metamorphosis or in the long period of time when the larvae remain in the tree. They are difficult to reach with common pesticide treatments and no treatment known today is totally effective.

The ECOPALM treatment aims to eradicate the *Rhynchophorus ferrugineus* when the infestation is in progress in order to save the palm tree.

The microwaves penetrate the various layers of wood where they strike eggs, cocoons with pupae and all other parasites, which are totally destroyed. ECOPALM guarantees total disinfestations from any pest.



Duration of the treatment: 40 minutes/palm tree.  
Duration of protection of more than one year.



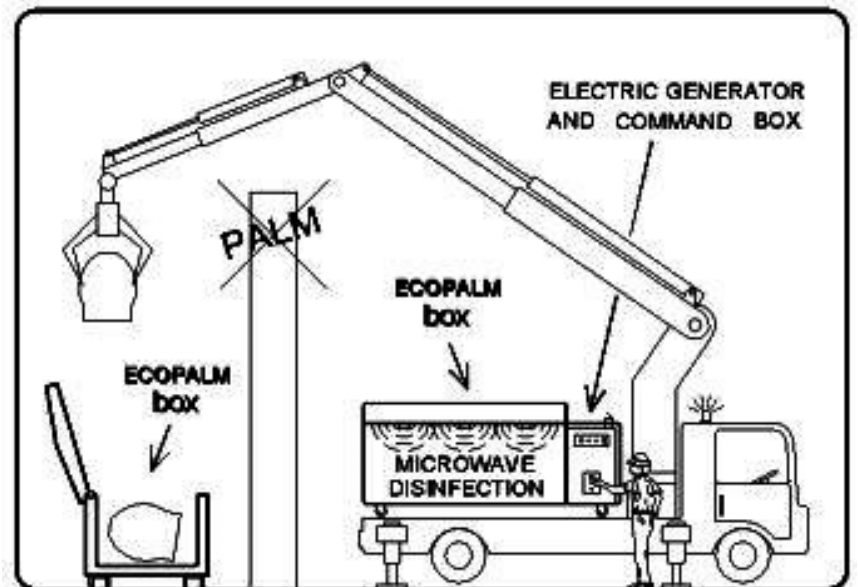
## 8. The operating principles of ECOPALM BOX

ECOPALM BOX is a closed container equipped with a microwaves generator. Any material placed inside the container is fully decontaminated in a very short time.

The ECOPALM BOX is set and mounted quickly onto any vehicle designed to carry skips.

BOX ECOPALM is already equipped with a diesel electric generator and a control panel. It can operate independently on a vehicle in motion or parked at the place of the disinfestations.

ECOPALM BOX is designed for disinfecting palms directly on the spot of felling. It makes possible to completely disinfect the leaves and the pieces of the trunk placed inside the container, with full security for the environment, and for surrounding people without any risk of dispersal of the Red Palm Weevil.





## 9. Decontamination of non recoverable palm trees with an ECOPALM BOX before destruction

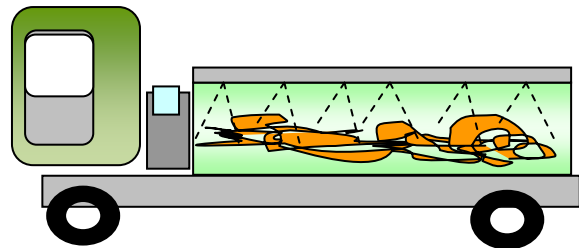
The use of the ECOPALM treatment is indispensable in the advanced attack stage when the palm tree is no longer recoverable. The device is useful to disinfest the tree on the spot, eradicating the red palm weevil at whatever stage of evolution.

After this treatment the palm tree is totally disinfested and can be disposed of in complete safety, just like a usual green waste and no longer like an “infested” hazardous waste.

During the microwave treatment, there is a major effect on the bark where the cocoons with pupae in the metamorphosis stage are located.

The energy of the microwaves totally eradicates them so that the pupae can no longer complete their evolution and become full-grown beetles.

This result can be achieved with no other known treatment. The life cycle of the red palm weevil is fully interrupted.

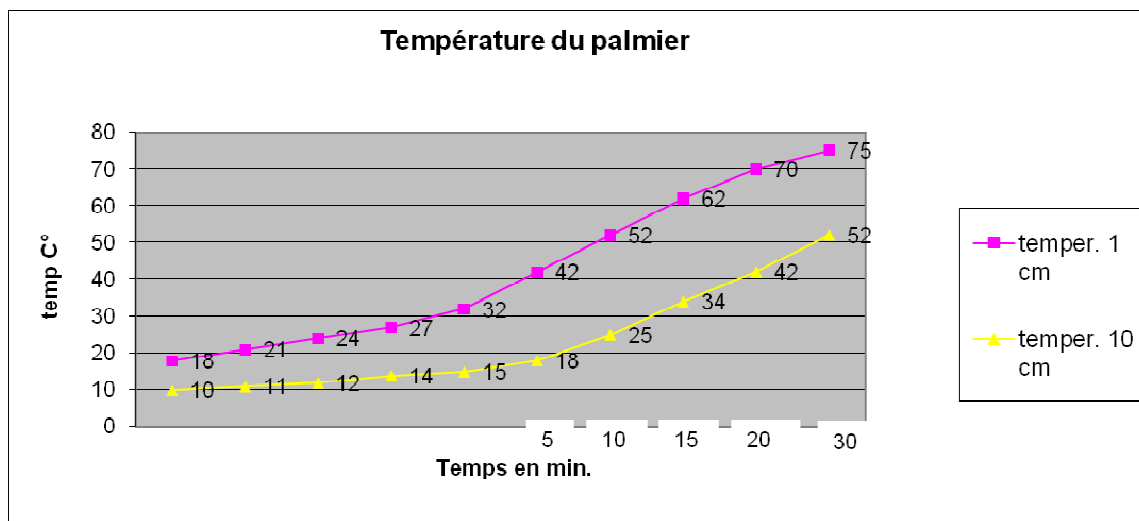


Duration of the treatment: 1 hour /palm tree



## 10. Some examples

### Infested palm tree – one hole - temperature and noise control



## ATTACK TO THE HEART OF THE PALM



Before the treatment



Treatment with Ecopalm ring



60 days after the treatment



**OBVIOUS ATTACK BY THE RED PALM WEEVIL**



Palm 60 days after the treatment

RED/PM - 23/03/2009

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**Test on a palm attacked to the foot and checking of the results of the ECOPALM treatment**



**Result after the ECOPALM treatment**



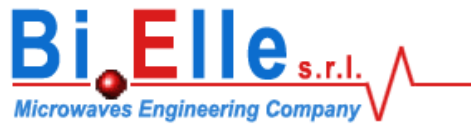


## Appendices





## The Bi.ELLE company



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[www.ecopalm.it](http://www.ecopalm.it)

Bi.Elle Srl has an extensive experience in microwave technology.  
It produces microwave devices for all kind of industries and for R&D for over 20 years:

### **COOKING – HEATING - DEFROSTING – DRYING – DEHYDRATION - BULK AND PACKED PRODUCT PASTEURIZING**

The production includes:

- continuous tunnel systems for industrial use,
- laboratory ovens,
- vacuum chambers,
- pressure microwave autoclaves for scientific research.
- and most recently the ECOPALM.

Bi.Elle Srl is operating in three locations:

- 1 production factory of 4000 sqm in Modena (IT).
- 1 microwave laboratory of 200 sqm in Modena (IT).
- 1 palm tree lab of 1000 sqm in Terracina (IT).

9 employees and 4 engineers are working for Bi.Elle Srl.

The company is headed by Mr. Giuseppe Bernabei and Mr. Luca Bernabei.

The factory in Modena



RED/PM - 23/03/2009

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The factory in Modena



The microwaves laboratory



The palm tree laboratory





**The red palm weevil, *Rhynchophorus ferrugineus* Olivier, has become the most important pest of the date palm in the world (Gomez & Ferry 1998).**

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Originating in southern Asia and Melanesia, where it is a serious pest of coconuts, this weevil has been advancing westwards very rapidly since the mid 1980s. It had reached the eastern region of the Kingdom of Saudi Arabia in 1985 (pers. obs.) and afterwards spread to many other areas in the Kingdom (Abozuhairah et al. 1996). The pest was first recorded in the northern United Arab Emirates in 1985, and since then it has spread to almost the entire U.A.E. (El-Ezaby 1998) and to Oman. In Iran, it was recorded in Savaran region in 1990 (Faghih 1996). Then it was discovered in Egypt at the end of November 1992 in El-Hussinia, Sharquiya region (Cox 1993). In 1994, it had been captured in the south of Spain (Barranco et al. 1996) and in 1999 had been found in Israel, Jordan and the Palestinian Authority Territories (Kehat 1999).

The cause of the high rate of spread of this pest is human intervention, by transporting infested young or adult date palm trees and offshoots from contaminated to uninfected areas.

In this article we present the current situation of the red palm weevil in Spain, Egypt and the Near East, to demonstrate the seriousness of this pest and the high risk of its arrival in other Mediterranean countries. In these countries, the two main palm species concerned are *Phoenix dactylifera* and *P. canariensis*, the main crop and ornamental species in the Mediterranean area, but it could attack some others ornamental palms (Barranco et al. 2000). Our purpose is to emphasise the need for urgent and strong prophylactic measures to avoid new catastrophes and for the reinforcement of co-operative international research against this pest.

The red palm weevil is a member of Coleoptera: Curculionidae. The male and female adults are large reddish brown beetles about 3 cm long and with a characteristic long curved rostrum; with strong wings, they are capable of undertaking long flights.

Damage to palms is produced mainly by the larvae. Adult females lay about 200 eggs at the base of young leaves or in wounds to the leaves and trunks; the grubs feed on the soft fibers and terminal bud tissues. They reach a size of more than 5 cm before pupation. Except just before pupating, they move towards the interior of the palm making tunnels and large cavities. They can be found in any place within the palm, even in the very base of the trunk where the roots emerge.

Pupation occurs generally outside the trunk, at the base of the palms. The larva pupates



in a cocoon made of brown dried palm fibres.

Overlapping generations with all life stages can be present within the same palm tree. Generally the adult weevils present in a palm will not move to another one while they can feed on it.

Usually the damage caused by the larvae is visible only long after infection, and by the time the first symptoms of the attack appear, they are so serious that they generally result in the death of the tree. This late detection of the presence of the weevil constitutes a serious problem in the fight against the pest and in any attempt to guarantee pest-free status in adult trees. Despite research carried out so far, no safe techniques for early detection of the pest have been devised.

In Spain, very soon after the red palm weevil killed the first *Phoenix canariensis* in some gardens of Almuñecar, the relevant authorities initiated various actions to combat the pest.

Intensive chemical treatments have been used to protect the *Phoenix* palms and to try to cure affected trees. Despite the difficulty in operating in the public gardens environment, foliage spraying has been conducted with various insecticides: Fenitrothion, Clorpirifos, Diazinon or Metidation. Preventive treatment of all the palms, even healthy ones, has been repeated once a month outside the tourist season.

Insecticides such as carbaril and imidacloprid have been injected several times and in various places all around the stems of palms. Simultaneously, a programme of mass trapping using aggregation pheromone and semi-synthetic kairomone has been initiated (Esteban-Durán et al. 1998). But despite all these efforts, more than one thousand *Phoenix* have been killed. In an area that extends from Motril to Nerja, in the Mediterranean coast of Granada and Málaga, the weevil is still present and has spread to villages close to the initial points of infection.

There is every evidence to suggest that the first weevils were introduced into Spain from adult palms imported from Egypt. Before the arrival of the weevil in the south of Spain, Egypt was the westernmost place where the red palm weevil has been recorded. Furthermore, as the importation of palms from Egypt was not prohibited, Egypt has been the main source of supply of ornamental adult *Phoenix* palms to satisfy the very substantial demand that exists in all the coastal cities of Spain and, more generally, of southern Europe.

In Egypt itself, the introduction of the red palm weevil was caused by an importation of offshoots from the United Arab Emirates. At the beginning, the extension of this pest into Egypt was restricted to a limited number of locations in two northeastern provinces. In 1995, three years after its first discovery in Egypt, an Egyptian agriculture official considered that the red palm weevil had been eradicated (Ferry 1996). Unfortunately, this announcement was erroneous. In the two provinces where the pest was first recorded, the red palm weevil continues to infect and kill new date palms year after year, despite all the efforts developed to combat it.

Various techniques have been used to try to control the red palm weevil (pheromone traps) and to save infested date palms (chemical control by pouring pesticides into the





trunk and injection of entomopathogenic nematodes (Shamseldean 1994)). Despite good results of these techniques in the laboratory, they are not efficient enough in the field to succeed in eliminating red palm weevil. The reason for this is probably the great difficulty in reaching all life stages of the weevil inside an adult palm tree, even with intensive and repeated stem injections or perfusions. Furthermore, such intensive activity is impossible for economic and practical reasons in places with a large number of date palms.

In Egypt, as well as in the south of Spain, the elimination of infested trees has not been applied systematically as soon as the pest were detected. The possibility of saving these trees and avoiding serious economic consequences as a result of their elimination, and the practical difficulties of carrying out this operation have unfortunately limited or delayed the destruction of infested trees. The affected trees have then constituted an important focus for further spread of the red palm weevil.

At present the situation in Egypt is very worrying. Although a small number of date palms are affected, red palm weevils have been recorded in each of the Delta administrative districts, as well as in some orchards along the road between Cairo and Alexandria and even in the capital itself. This extension is certainly partly due to the difficulty of implementing a ban on the exchange or transplanting of offshoots or ornamental adult palms as a rigorous prophylactic measure. Although the red palm weevil does not usually fly very much in the orchards where it is present, it probably flies to new orchards when, after killing all the existing date palms, it does not find enough food.

In Israel, early detection of the pest, when the number of affected trees was still very limited, resulted very quickly in the establishment of a program of integrated pest management. Substantial financial and human resources have been dedicated to avoiding the spread of the pest. Each new affected tree is immediately eliminated. More than 4000 pheromone traps have been located at a high density in 450 ha date plantations along the Jordan Valley. The incorporation of the systemic pesticide Confidor in the irrigation water has also been used. Despite all these efforts, newly infested trees are still being recorded, three years after the first detection of the pest, and red palm weevils are still being caught in traps.

### **Conclusions**

Even when important and costly means are dedicated to combat the red palm weevil, an efficient solution to fight against it when it first arrives is still missing

However, the main ornamental tall palms planted in the gardens and in the streets of the Mediterranean coast cities are date palms. Thousands of them are imported from Egypt each year directly or indirectly into Spain and other European countries. These palms must have a phytosanitary passport but in specimens such as adult date palms, a large quantity of hidden insects and diseases, can evidently remain undetected, even after very careful phytosanitary scrutiny, and this is, of course, the case red palm weevil eggs and larvae.

In response to the appearance of the red palm weevil in the south of Spain, the Spanish government promulgated a decree in 1996 forbidding the importation of palms from countries where pests of the group of *Rhynchophorus* have been recorded. Four years





later this decree was modified, and one of the consequences has been that importation of date palms from Egypt is no longer illegal. This modification to the decree was probably made partly because adult date palms were still arriving in Spain from neighboring countries, with the disappearance of the border controls between European Union member countries.

The market for adult date palms from Egypt is very lucrative. It also seems difficult to convince decision-makers and individuals to wait until specimens grown locally became tall enough for landscaping, instead of asking for palms from Egypt. For these two reasons, we think that there is a need for phytosanitary regulations at a European and North African country level to forbid totally the importation of date palms. Otherwise disasters such as the one that has occurred in Almuñecar or, worse still, the one that continues to develop in Egypt, are probable in other places around the Mediterranean. Such disasters could occur in the coastal cities where Phoenix palms constitute one of the characteristic landscape elements; from there, it could extend to the important inland date palm groves of North Africa. It could be also a catastrophe in Elche where the date grove has been nominated as a World Heritage Site. We consider also that European research centers should contribute to help all countries affected by red palm weevil to find a solution to combat this pest.

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## Red Palm Weevil kills 119 palm trees since outbreak (Malta)

by **MICHAEL CARABOTT**

The notorious palm-killing bug Red Palm Weevil has resulted in 119 requests for the Rural Affairs and Resources Ministry to uproot and dispose of infected and dead trees.

Through sources, The Malta Independent has learned that a total of 62 trees have already been disposed of while another 57 still need to be removed. Driving around Malta and Gozo, one can see various trees that have been swathed in plastic to prevent the spread of the killer bug.

The Red Palm Weevil, is known in Maltese as the Bumunqar Ahmar tal-Palm, *Rhynchophorus ferrugineus* (Olivier). The weevil has infected plants across the whole of the Mediterranean and has infected two types of palm trees, *Phoenix dactylifera* and *P.canariensis*, although it does also attack others.

The weevil is some two to five centimetres long, quite large for an insect, and has a prominent beak, looking much like a hook. The insect can fly for a kilometre without stopping. It kills palm trees by eating from the bark and burrowing into the main stem. It then lays its eggs inside.

Unfortunately, it is very difficult to detect damage because of the way the bugs burrow inside. In fact, when one sees the first signs of infestation, it is often too late to save the trees. However, to stave off further infestations, various 'honey pots' were placed in and around gardens and green areas which contained substances to attract and trap the insects. The bug's natural habitat is tropical Asia and it is very adaptable to new climates. It reached the Mediterranean in the 1980s and its move here is largely attributed to importation from countries with infestations. Its original target were coconut trees, but then it changed to attack various forms of palm.

The response time varies according to the urgency of the case and is normally about five weeks. Some are not so urgent and are contained with plastic sheeting. There are other cases where the authorities identify clusters of infestations and all are tackled at one go. The weevil lays some 200 eggs that take between two and 18 months to reach full development. This depends on the nutrients of the host tree and the overall temperature. When the palm trees are cut up, up to 100 bugs have been found in a single specimen. The ministry said that anyone with suspicion of an infestation is to report the matter to the Department of Plant Health on 2339-7205 or 2339-7223.



## OBSERVATORIO DO ALGARVE

### Red palm weevil killing Algarve palm trees



22-10-2007 10:50:00

A plague of insects has moved here from southern Spain and has been spotted in Albufeira and Portimão. In neighbouring Spain, red palm weevils have been responsible for millions of euros of damage.

At least five outbreaks of red palm weevils have been found by the Algarve Regional Agriculture Directorate: they are regarded as being lethal for a number of species of palm trees. The plague of insects from the weevil family was first found in the parish of Guia, Albufeira, in August, according to the newspaper "Expresso".

At the end of September, the DRAP, the Algarve Regional Agriculture Directorate, again detected the presence of *Rynchophorus Ferrugineus* (scientific name) in palm trees in the municipality of Albufeira, with three outbreaks, and in Portimão with two.

The same newspaper was told by José Manuel Grosso-Silva, an insect specialist from CIBIO, the Centre for Research into Biodiversity and Genetic Resources at the University of Porto, that the insect was bigger than most species of weevil present in Portugal and might have been introduced accidentally into the country, through sales of plants, or it could just have spread to here from Spain.

The same specialist said that using chemicals on the insects was not totally effective, which is why it is difficult to put an end to the plague.

Specialists at the Algarve DRAP will be discussing the matter from 22<sup>nd</sup> to 26<sup>th</sup> of this month at the 5<sup>th</sup> National Congress of Applied Entomology in Cartagena, Spain and will pay a technical visit to the region of Malaga to try and prevent the plague reaching the palm trees of the Algarve.

#### **A deadly beetle**

Originally from southeast Asia, *Rynchophorus Ferrugineus* has a preference for Canary Palms which are very common in Portugal and Spain.

They act mainly on the base of leaves and inside the stem, and it is especially worrying because they can kill a tree in two to three months.



The problem is worsened by the fact that it is difficult to detect an infestation before it has reached an advanced stage. Once they have finished their “meal”, the Asian red palm weevils move on to other palm trees nearby, using their sense of smell.

The plague of insects was detected in the area of Alicante in 1995, and has spread through the south of the country, causing serious damage. Fighting the plagues has cost the Spanish some 16 million euros.

The European commission has already reacted to the plague and in May published emergency measures including an obligatory quarantine period in the country of origin (in the case of a third country) for one year before importation, and of more than one year in the receiving country, in order to try and avoid the spreading of the Asian red palm weevil.

[Mário Lino](#)





## Red palm weevil making wider inroads (Times of Malta)

Natalino Fenech



The Ministry of Rural Affairs and Environment is shortly expected to set up a commission to study the impact the red palm weevil is having on palm trees and devise a plan of action in a bid to try and halt its rapid spread, a spokesman said.

Environment Minister George Pullicino made the decision following advice that Palm tree could disappear from the Maltese landscape because the weevil, a beetle that thrives on palms, has already infected dozens of trees and is destroying a lot of them. What's more, the weevil is spreading fast.

The beetle was first discovered in a Wardija garden some time in July but it is not known whether it had been here earlier. Traps baited with pheromone immediately proved the beetle's presence, Marica Gatt, the Director of Plant Health at the Rural Affairs Ministry, told The Times. Since then, its spread started being noted in spite of a plan to try and stem it.

From Wardija and St Paul's Bay, cases have now been detected in Hamrun and Qormi.

Dr Gatt said the Plant Health Department was recommending both showering with insecticide as well as injecting the trees.

Traps are also being used even if only males are trapped. However, the use of traps does reduce the population and the possibility of the beetles mating and continuing to multiply.

A reader of The Times, who preferred not to be named, said he had managed to stem the infestation in some trees by injecting them with insecticide.

Holes have to be drilled at an angle of 45 degrees as close as possible to the crown and about 15 centimetres deep into the tree. A strong dose of insecticide is then injected. Infected palm trees showed signs of recovery after being so treated, he said.



The problem is that no tests are being carried out to see how long insecticide injections could last and to devise an effective management programme against the insect.

The advantage of injecting the trees was that insecticides were contained inside the tree and did not have side effects on other insects and fauna.

The commission about to be set up is expected to recommend the best practices for the eradication of the pest while having the least possible impact on other species.

Dr Gatt said it was evident the weevil had been imported but one could not simply ban as such a move would violate World Trade Organisation rules.

Quarantine for trees has been imposed and, as the weevil is as yet not reported in Gozo, the movement of palm trees between the two islands has been banned.

The Environment Ministry is seeing what further steps can be taken because it is feared that the pest could adapt and attack other tree species.

The weevil is wreaking havoc in the Middle East and Europe and some Arab countries are experiencing a loss of income as palm trees there are cultivated for dates.

In the Middle East, the palm tree has a cultural, religious and economic significance, whereas in Malta it only has an aesthetic value.

The red palm weevil was first noted in 1891 in India and was recognised as a serious pest of the coconut palm in 1906. By 1917 it was described as a serious pest in the date palm in the Punjab, India. A year later it caused serious damage to the date palm in Iraq. In the mid-1980s, it was discovered in the Arabian Gulf countries and has become a most destructive pest of date palms in the Middle East.

Research is being carried out in a bid to control the weevil but, because in many countries the fruit is harvested, the use of insecticides has to be limited.

Weevils seem to prefer palm trees that are under 20 years old as the stem of the young palm is soft and can be penetrated easily. An adult female beetle enters the crown of the trees and lays up to 300 eggs. It can also lay its eggs in cracks, from where offshoots emerge. The eggs hatch in two to five days and the legless grubs bore into the interior of the palms, feeding on the soft succulent tissues and discarding fibrous material.

The larval period varies from one to three months. The grubs turn to pupae in a cylindrical cocoon made out of fibrous strands. At the end of the pupation period, which lasts 14 to 21 days, the adult weevils emerge. The whole life cycle is about four months.

It is difficult to detect the early infestation, as the larva begins its life inside the palm and usually does not come to the surface. Hence, neither the larva nor the damage it causes can be seen. As the infestation progresses, a brownish viscous liquid starts oozing and pieces of chewed fibres can be seen emerging from small holes in the crown or the stem.

The attack by the weevil is noticed only when the tree is practically beyond repair.



The rotting of tissue due to infestation by this pest presents a characteristic odour. Wilting or yellowing of leaves is usually observed.

The larvae are responsible for damaging the palm and once they have gained access, the death of the palm generally ensues.

The damage caused by a few larvae of the weevil is astonishing. Even one larva may cause considerable damage and, sometimes, the death of a palm.