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SUBDIRECCION GENERAL DE SANIDAD VEGETAL

05-11542
PPM point 8.2

PEST RISK ANALYSIS (using draft EPPO Scheme)

STAGE 1: INITIATION **Identify pest**		
This section examines the identity of the pest to ensure that the assessment is being performed on a real identifiable organism and that biological and other information used in the assessment is relevant to the organism in question.		
1. Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank ? *if yes go to 3* *if no go to 2*	**Yes**	***Insecta*** ***Lepidoptera*** ***Castniidae*** ***Castniinae*** *Paysandisia archon* (Burmeister, 1880)
2. Attempt to redefine the taxonomic entity so that the criteria under 1 are satisfied. Is this possible ? *if yes go to 3* *if no go to 22*		
The PRA Area		
The PRA area can be a complete country, several countries or part(s) of one or several countries.		

3. Clearly define the PRA area.		Spain, France, Italy and other E.U. Mediterranean countries
	Go to 4.	
Earlier analysis		
The pest, or a very similar pest, may have been subjected to the PRA process before, nationally or internationally. This may partly or entirely replace the need for a new PRA.		
4. Does a relevant earlier PRA exist ? *if yes go to 5* *if no go to 7*	**No**	
5. Is the earlier PRA still entirely valid, or only partly valid (out of date, applied in different circumstances, for a similar but distinct pest) ? *if entirely valid End* *if partly valid go to 6* *if not valid go to 7*		
6. Proceed with the assessment, but compare as much as possible with the earlier assessment.		

STAGE 2. PEST RISK ASSESSMENT **Section A: Qualitative criteria of a quarantine pest** **Geographical criteria**
This section considers the geographical distribution of the pest in the PRA area.

7. Does the pest occur in the PRA area ? *if yes go to 8* *if no go to 9*	**Yes**	*Paysandisia archon* was first reported from Europe from Catalonia (Spain) in March 2001 (Aguilar, L., Miller J.Y & Sarto i Monteys, V., 2001). Soon thereafter it was reported from SE France and Italy as well as other Spanish Autonomous communities (Comunidad Valenciana and Baleares) (see references)
8. Is the pest of limited distribution in the PRA area ? <u>Note:</u> *"of limited distribution" means that the pest has not reached the limits of its potential range either in the field or in protected conditions : it is not limited to its present distribution by climatic conditions or host-plant distribution. There should be evidence that, without phytosanitary measures, the pest would be capable of additional spread.* *if yes go to 18* *if no go to 22*	**Yes**	*Paysandisia archon* has not yet reached the limits of its distribution within Spain, France and Italy and it is not present as yet in other parts of the EU with similar ecoclimatic conditions and hostplants. As the larvae of this species live inside the hostplant (palm trees) it is possible that they can survive in protected conditions in other parts of the EU. In fact, one moth was detected in Sussex (England, UK) in August 2002 (Patton & Perry, 2002), most likely originating from palms imported from southern Europe.

Potential for establishment		
For the pest to establish, it must find a widely distributed host plant in the PRA area (do not consider plants which are accidentally / very occasional hosts or recorded only under experimental conditions). If it requires a vector, a suitable species must be present or its native vector must be introduced. The pest must also find environmental conditions suitable for survival, multiplication and spread, either in the field or in protected conditions.		
9. Does at least one host plant grow to a substantial extent in the PRA area, in the open, in protected cultivation or both ? *if yes go to 10* *if no go to 22*		
10. Does the pest have to pass part of its life cycle on a host plant other than its major host (*i.e.* obligate alternate host plant) ? *if yes go to 11* *if no go to 12*		
11. Does the alternate host plant occur in the same part of the PRA area as the major host plant ? *if yes go to 12* *if no go to 22*		
12. Does the pest require a vector (*i.e.* is vector transmission the only means of dispersal) ? *if yes go to 13* *if no go to 14*		

13. Is the vector (or a similar species which is known or suspected to be a vector) firstly <u>present</u> in the PRA area <u>or</u> secondly <u>likely to be introduced</u>. If in doubt, a separate assessment of the probability of introduction of the vector (in Section B1) may be needed ? *if yes go to 14* *if no go to 22*		
14. Does the known geographical distribution of the pest include eco-climatic zones comparable with those of the PRA area ? *if yes go to 18* *if no go to 15*		
15. Is it probable, nevertheless, that the pest could survive and thrive in a wider eco-climatic zone that could include the PRA area ? *if yes go to 18* *if no go to 16*		
16. Could the eco-climatic requirements of the pest be found in protected conditions in the PRA area ? *if yes go to 17* *if no go to 22*		

17. Is a host plant grown in protected conditions in the PRA area ? *if yes go to 18* *if no go to 22*		

Potential economic importance		
Economic impact principally concerns direct damage to plants but may be considered very broadly, to include also social and environmental aspects. The effect of the presence of the pest on exports from the PRA area should be allowed for. *In deciding whether economically important damage or loss to plants may occur, it is necessary to consider whether climate and cultural conditions in the PRA area are conducive to damage expression, which is not always the case even if both host and pest survive under these conditions.* *Note: when performing a PRA on a pest that is transmitted by a vector, consider also any possible damage that the vector may cause.*		
18. With specific reference to the host plant(s) which occur(s) in the PRA area, and the parts of those plants which are damaged, does the pest in its present range cause significant damage or loss ? *if yes go to 21* *if no go to 19*	**Yes**	The larvae of *Paysandisia archon* bore through the stype (trunk) and crown of palm trees, producing galleries that can reach up to 80 cm. The galleries (axial and transversal) can be seen inside the stype when the latter is cut in slices. Heavy attack may cause deformation of stype and crown as well as leaf drying, especially the core leaves, and, ultimately, death.

19. Could the pest, nevertheless, cause significant damage or loss in the PRA area, considering eco-climatic and other factors for damage expression ? *if yes go to 21* *if no go to 20*		

20. Would the presence of the pest cause other negative economic impacts (social, environmental, loss of export markets) ? *if yes go to 21* *if no go to 22*		
21. This pest could present a risk to the PRA area: <u>Yes</u> **Go To Section B**		
22. This pest does not qualify as a quarantine pest and the assessment can stop:		

However if this is the first time that the decision-making scheme has directed you to this point, it may be worth returning to the question that led you here and continuing through the scheme in case the remaining questions strongly indicate categorisation as a possible quarantine pest. In the latter case, seek a second opinion to decide whether the answers which led you to this point could be given a different reply.

Section B: Quantitative evaluation		
The second part of the risk assessment process firstly estimates the probability of the pest being introduced into the PRA area (its entry and establishment) and secondly makes as assessment of the likely economic impact if that should happen. From these two aspects, it should be possible to arrive at the level of "pest risk" presented by the pest; this can then be used in the pest risk management phase to decide whether it is necessary to take phytosanitary measures to prevent the introduction of the pest, or if the measures chosen are appropriate for the level of risk. The questions in this section require an evaluation from minimum probability or impact (1) to maximum probability or impact (9). This must be done by an expert who can make an estimate according to the information provided (following the format of the checklist of EPPO , 1993) and also according to comparison with other pests. *Answer as many of the following questions as possible, insofar as they are relevant to the pest concerned. .If you cannot answer a particular question, do not give any score. Note whether this is because of lack of information or because the question is irrelevant to the pest concerned.* *Questions marked with an asterisk (*) are to be considered as more important than the others in the same section.*		
1. Probability of introduction. *Introduction, as defined by the FAO Glossary of Phytosanitary Terms, is the entry of pest resulting in its establishment.*		
Entry		
List all the pathways that the pest could possibly be carried on *Note: a pathway can be any form of human activity that could transport the pest from a particular origin: e.g. plants and plant products moving in trade, any other traded commodity, containers and packing, ships, planes, trains, road transport, passengers, mail etc. Note that similar means of pest transport from different origins can present greatly different probabilities of introduction, depending on the concentration of the pest in the area of origin. The pathways given should be only those already in operation, or proposed.*		~~1)~~The pest could be carried within whole plants (palm trees) moving in trade, either in containers, ships, planes, trains and road transport. Because the larvae are very catholic feeders on palms, any palm species (native or introduced) could hold larvae. ~~3)~~

Mise en forme : Puces et numéros

Mise en forme : Puces et numéros

1.1 How many pathways could the pest be carried on ? *few = 1* *many =9*	**1**	See above
1.2 For each pathway, starting with the most important pathway identified above (*i.e.* that which carries the greatest trade or which is most likely to act as a means of introduction) and then in descending order of importance, answer questions 1.3 to 1.13. If one of the questions 1.3a, 1.5a, 1.7a or 1.12a is answered by 'no', the pathway could not act as a means of entry for the pest and the scheme will return directly to this point, omitting later questions. Use expert judgement to decide how many pathways to consider.	*Go to 1.3*	
1.3a Could the pest be associated with the pathway at origin ? *Note: does the pest occur in the area of origin ? Is the pest in a life-stage which would be associated with commodities, containers or conveyances ?* *if yes go to 1.3b* *if no go to 1.2*	**Yes**	~~(3)~~The pest could be associated with the pathway at origin as it is able to complete its life cycle within the hostplant.

Mise en forme : Puces et numéros

1.3b How likely is the pest to be associated with the pathway at origin ? *not likely = 1* *very likely =9*	**9**	See above.
1.4 Is the concentration of the pest on the pathway at origin likely to be high? *not likely = 1* *very likely =9*	**9**	
1.5a Could the pest survive existing cultivation or commercial practices ? *Note: these are practices mainly in the country of origin, such as pesticide application, removal of substandard produce, kiln-drying of wood.* *if yes go to 1.5b* *if no go to 1.2*	**Yes**	~~(3)~~The phytosanitary measures tried so far (use of insecticides) against the pest are quite unsatisfactory when the larvae are already within the palm stype or crown. And there is no doubt, the pest survives existing cultivation or commercial practices.
1.5b How likely is the pest to survive existing cultivation or commercial practices ? *not likely = 1* *very likely =9*	**9**	See above

Mise en forme : Puces et numéros

1.6 How likely is the pest to survive or remain undetected during existing phytosanitary procedures ? <u>Note:</u> *existing phytosanitary measures (e.g. inspection, testing or treatments) are most probably being applied as a protection against other (quarantine) pests; the assessor should bear in mind that such measures could be removed in the future if the other pests were to be re-evaluated.* *the likelihood of detecting the pest during inspection or testing will depend on a number of factors including:* • *ease of detection of the life stages which are likely to be present. Some stages are more readily detected than others, for example, insect adults may be more obvious than eggs;* • *location of the pest on the commodity. Surface-feeders are more readily detected than internal-feeders;* • *symptom expression: many diseases may be latent for long periods, at certain times of the year, or may be without symptoms in some hosts or cultivars and virulent in others;* • *distinctiveness of symptoms: the symptoms might resemble those of other pests or sources of damage such as mechanical or cold injury;* • *the intensity of the sampling and inspection regimes;* • *distinguishing the pest from similar organisms.* *not likely = 1* *very likely =9*	**8**	Mostly because the larvae are internal-feeders, and eggs and cocoons are difficult to see on the palm stypes/crowns.

1.7a Could the pest survive in transit ? *Note: consideration should be given to:* • *speed and conditions of transport* • *vulnerability of the life-stages likely to be transported* • *whether the life cycle is of sufficient duration to extend beyond time in transit* • *the number of individuals likely to be associated with a consignment.* • *Interception data can be used to estimate the ability of a pest to survive in transit.* *if yes go to 1.7b* *if no go to 1.2*	**Yes**	~~(3)~~Eggs, pupae (in cocoons) and, especially, larvae are attached to or hiding within the hostplant.
1.7b How likely is the pest to survive in transit ? *not likely = 1* *very likely =9*	**9**	The pest will survive in transit even if the hostplant dies while this is on.
1.8 How likely is the pest to multiply during transit ? *not likely = 1* *very likely =9*	**1**	The complete life cycle is long (one or two years)

1.9 How large is movement along the pathway ? *Note: the volume of material being moved* *not large = 1* *very large = 9*	**8**	Import of non-native palms into the EU, which are later used in public and private gardens, is very important. Palms come from many different geographic areas (South and Central America, Egypt, Turkey...) and once into Europe they move again from country to country, following the trade pathways.

Mise en forme : Puces et numéros

1.10 How widely is the commodity to be distributed through the PRA area ? *<u>Note:</u> the more scattered the destinations, the more likely it is that the pest might find suitable habitats.* *not widely = 1* *very widely =9*	**9**	Palm trees are mostly used for decorative reasons so that they are highly appreciated by people and Town halls all over Europe.
1.11 How widely spread in time is the arrival of different consignments ? *Note: introduction at many different times of the year will increase the probability that entry of the pest will occur at a life stage of the pest or the host suitable for establishment.* *not widely = 1* *very widely =9*	**9**	Consignments carrying palm trees occur over the whole year.

1.12a Could the pest transfer from the pathway to a suitable host ? *<u>Note:</u> consider innate dispersal mechanisms or the need for vectors, and how close the pathway on arrival is to suitable hosts.* *if yes go to 1.12b* *if no go to 1.2*	**Yes**	The adult insect (a moth) is a very powerful flyer.
1.12b How likely is the pest to be able to transfer from the pathway to a suitable host ? *not widely = 1* *very widely =9*	**9**	
1.13 Is the intended use of the commodity (*e.g.* processing, consumption, planting, disposal of waste) likely to aid introduction ? *<u>Note:</u> consider whether the intended use of the commodity would destroy the pest or whether the processing, planting or disposal might be done in the vicinity of suitable hosts.* *not likely = 1* *very likely =9*	**9**	~~(4)~~Palm trees are mostly used for being planted for decorative purposes, so that their intended use will certainly aid introduction.

Mise en forme : Puces et numéros

Establishment **1.14 How many host plant species are present in the PRA area?** *one or few = 1* *many = 9*	**8**	*Brahea armata, B. edulis, Butia capitata, Chamaerops humilis, Livistona australis, L. chinensis, L. decipiens, L. saribus, Phoenix canariensis, P. dactylifera, P. reclinata, P. roebelenii, P. sylvestris, Sabal mexicana, S. minor, S. palmetto, Trachycarpus fortunei, T. wagnerianus, Trithrinax campestris, Washingtonia filifera, W. robusta* and more..
1.15 How extensive are the host plants in the PRA area? *rare = 1* *widespread =9*	**9**	Palms are planted for decorative reasons in public and private gardens
1.16 If an alternate host is needed to complete the life cycle, how extensive are such host plants in the PRA area? *rare = 1* *widespread=9*		Not applicable as no alternate host is needed by this pest
1.17 *If a vector is needed for dispersal, how likely is the pest to become associated with a suitable vector? *<u>Note</u>: is the vector present in the PRA area, could it be introduced or could another vector be found?* *not likely = 1* *very likely = 9*		Not applicable

1.18 Has the pest been recorded on crops in protected conditions elsewhere? (Answer this question only if protected cultivation is important in the PRA area.) *no = 1* *often = 9*		
1.19 How likely are wild plants (*i.e.* plants not under cultivation, including weeds, volunteer plants, feral plants) to be significant in dispersal or maintenance of populations? *not likely = 1* *very likely =9*	**4**	The only European native palm, *Chamaerops humilis*, grows wild in several Mediterranean areas and it has proven to be attacked by *Paysandisia archon*
1.20 *How similar are the climatic conditions that would affect pest establishment in the PRA area and in the area of origin? *Note: the climatic conditions in the PRA area to be considered may include those in protected cultivation.* *not similar =1* *very similar=9*	**7**	Northeastern Argentina, where the pest comes from, has a climate quite similar to that found in Mediterranean Europe

1.21 How similar are other abiotic factors in the PRA area and in the area of origin? *Note: the major abiotic factor to be considered is soil type; others are, for example, environmental pollution, topography/orography.*		No data available on this, although, thus far, they do not seem to be relevant as far as the pest is concerned.
1.22 How likely is the pest to have competition from existing species in the PRA area for its ecological niche? *very likely =1* *not likely = 9*	**7**	*Rynchophorus ferrugineus* (Coleoptera: Curculionidae), also a palm-borer, might be a competitor in southern Spain, where it was also introduced.
1.23 How likely is establishment to be prevented by natural enemies already present in the PRA area? *very likely =1* *not likely = 9*	**8**	So far there are no factual data available as to natural enemies in the area of origin. Likewise, in Europe, no natural enemies have been reported as of March 2004, and the pest easily established itself.

1.24 *If there are differences in the crop environment in the PRA area to that in the area of origin, are they likely to aid establishment? <u>Note</u>: *factors that should be considered include: time of year that the crop is grown, soil preparation, method of planting, irrigation, whether grown under protected conditions, surrounding crops, management during the growing season, time of harvest, method of harvest etc.* *not likely = 1* *very likely =9*	**1**	The differences between the crop environment in the PRA area and that of the area of origin, although existing in some cases, would not affect the establishment of the pest (either hindering or aiding it)
1.25 Are the control measures which are already used against other pests during the growing of the crop likely to prevent establishment of the pest? *very likely =1* *not likely = 9*	**8**	Control measures against *Paysandisia archon* are very specific.

1.26 *Is the reproductive strategy of the pest and duration of life cycle likely to aid establishment? *Note: consider characteristics which would enable the pest to reproduce effectively in a new environment, such as parthenogenesis/self-crossing, duration of the life cycle, number of generations per year, resting stage etc.* *not likely = 1* *very likely =9*	**8**	The reproductive strategy of the pest aids establishment because most of the life cycle occurs within the hostplant and migh take one or two years to be completed.
1.27 How likely are relatively low populations of the pest to become established? *not likely =1* *very likely =9*	**9**	See item 1.26 above.
1.28 How probable is it that the pest could be eradicated from the PRA area? *very likely =1* *not likely = 9*	**5**	Eradication is difficult because the insect larvae stay and develop for one or two years within the hostplant. Also, adult moths can fly and spread the species further away. Economically speaking, eradication measures are expensive and in some cases imply the destruction of the hostplant/s.

1.29 How genetically adaptable is the pest? *<u>Note</u>: is the species polymorphic, with, for example, subspecies, pathotypes? Is it known to have a high mutation rate? This genotypic (and phenotypic) variability facilitates the pest's ability to withstand environmental fluctuations, to adapt to a wider range of habitats, to develop pesticide resistance and to overcome host resistance.* *not adaptable =1* *very adaptable = 9*		No data available as yet.
1.30 *How often has the pest been introduced into new areas outside its original range? *<u>Note</u>: if this has happened even once before, it is important proof that the pest has the ability to pass through most of the steps in this section (i.e. association with the pathway at origin, survival in transit, transfer to the host at arrival and successful establishment). If it has occurred often, it suggests an aptitude for transfer and establishment.* *never = 1* *often = 9*	**3**	As far as we know, it has only been introduced into Mediterranean countries.

2. Economic Impact Assessment		
Identify the potential hosts in the PRA area, noting whether wild or cultivated, field or glasshouse. Consider these in answering the following questions. When performing a PRA on a pest that is transmitted by a vector, consider also any possible damage that the vector may cause. *According to the pest and host(s) concerned, it may be appropriate to consider all hosts together in answering the questions once, or else to answer the questions separately for specific hosts.* *Note that, for most pest/crop/area combinations, precise economic evaluations are lacking. In this section, therefore, expert opinion is asked to provide an evaluation of the likely scale of impact. Both long-term and short-term effects should be considered for all aspects of economic impact.*		
2.1 *How important is economic loss caused by the pest within its existing geographic range? *little importance =1* *very important = 9*	**9**	In Spain, economic losses because of the pest are very important as palm trees are expensive decorative plants. Palms are also used to get "white palm bunches" for Easter celebrations and date fruits.
2.2 How important is environmental damage caused by the pest within its existing geographic range? *<u>Note</u>: environmental damage may be impact on ecosystem health, such as effects on endangered / threatened species, keystone species or biodiversity.* *little importance = 1* *very important = 9*	**8**	The native European Palm, *Chamaerops humilis*, is a protected palm in several Spanish Autonomous Communities. Also, "El Palmeral de Elche" (Alicante), mostly housing *Phoenix dactylifera*, has the biggest palm grove in Europe and is a declared World Heritage Area by the UNESCO.

2.3 How important is social damage caused by the pest within its existing geographic range? *Note: social effects could be, for example, damaging the livelihood of a proportion of the human population, or changing the habits of a proportion of the population (e.g. limiting the supply of a socially important food).* *little importance = 1* *very important = 9*		Not applicable
2.4 *How extensive is the part of the PRA area likely to suffer damage from the pest? *Note: the part of the PRA area likely to suffer damage is the endangered area, which can be defined eco-climatically, geographically, by crop or by production system (e.g. protected cultivation).* *very limited = 1* *whole PRA area = 9*	**9**	Because of the generally mild climate of the PRA and the widespread use of palm trees as decorative plants, the whole PRA area is at risk.
Spread potential is an important element in determining how fast economic impact is expressed and how readily a pest can be contained.		
2.5 *How rapidly is the pest liable to spread in the PRA area by natural means? *very slowly = 1* *very rapidly =9*	**7**	The moths are very powerful flyers. Although no specific studies have been carried out as yet on how far they can fly (from where they were born), indirect data indicate distances are not less than 25-30 km.

2.6 How rapidly is the pest liable to spread in the PRA area by human assistance? *very slowly =1* *very rapidly=9*	**9**	
2.7 How likely is it that the spread of the pest could be contained within the PRA area? <u>Note</u>*: consider the biological characteristics of the pest that might allow it to be contained in part of the PRA area; consider the practicality and costs of possible containment measures.* *very likely =1* *not likely = 9*	**5**	The usual trade movement of palm trees within the PRA is quite wide, and only thoroughly controlling it the spread of the pest might be diminished. However, detecting symptoms of infestation on palms is not always easy. In addition to that, the moth can fly and, therefore, colonize new areas within the PRA.
2.8 *Considering the ecological conditions in the PRA area, how serious is the direct effect of the pest on crop yield and/or quality likely to be? <u>Note</u>*: the ecological conditions in the PRA area may be adequate for pest survival but may not be suitable for significant damage on the host plant(s). Consider also effects on non-commercial crops, e.g. private gardens, amenity plantings.* *not serious=1* *very serious=9*	**8**	The direct effect of the pest on the quality of the hostplants (palm trees) is very serious and can eventually kill them.

2.9 How likely is the pest to have a significant effect on producer profits due to changes in production costs, yields *etc.* in the PRA area? *not likely = 1* *very likely =9*	**8**	The pest might discourage public and private potential buyers of palm trees, who might turn instead to other plants, so that palm growers would be heavily affected economically.
2.10 How likely is the pest to have a significant effect on consumer demand in the PRA area? *Note: consumer demand could be affected by loss in quality and/or increased prices.* *not likely = 1* *very likely = 9*	**8**	See item 2.9 above.
2.11 How likely is the presence of the pest in the PRA area to affect export markets? *Note: consider the extent of any phytosanitary measures likely to be imposed by trading partners.* *not likely = 1* *very likely= 9*	**9**	Northern European countries might ban importation of palm trees from their Southern European counterparts. In addition to that, exports of palms from the EU Mediterranean countries affected by the pest towards other non-European areas in the World can also be affected.
2.12 How important would other costs resulting from introduction be? *Note: costs to the government, such as research, advice, publicity, certification schemes; costs (or benefits) to the crop protection industry.* *little importance =1* *very important = 9*	**7**	

2.13 How important is the environmental damage likely to be in the PRA area? *little importance = 1* *very important = 9*	**3**	*Paysandisia archon* can cause environmental damage in areas where native (*Chamaerops humilis*) or acclimatized (*Phoenix dactylifera*) palms grow.
2.14 How important is the social damage likely to be in the PRA area? *little importance = 1* *very important = 9*	**3**	In some parts of Spain, the production of date fruits as well as ornamental palms is relevant.
2.15 How probable is it that natural enemies, already present in the PRA area, will affect populations of the pest if introduced? *very likely = 1* *not likely = 9*	**8**	So far, no natural enemies have been found in the PRA area. However, they might be found should a focussed research be undertaken.
2.16 How easily can the pest be controlled? *Note: difficulty of control can result from such factors as lack of effective plant protection products against this pest, occurrence of the pest in natural habitats or amenity land, simultaneous presence of more than one stage in the life cycle, absence of resistant cultivars.* *easily = 1* *with difficulty= 9*	**7**	*Paysandisia archon* larvae are endophagous, so that contact insecticides are only effective during the short time elapsed between larval eclosion and penetration into the hostplant. No data are available as yet concerning the effect of strong systemic insecticides (injected into the palms), whose use in either private or public gardens might also be dangerous.

2.17 How likely are control measures to disrupt existing biological or integrated systems for control of other pests? *not likely = 1* *very likely = 9*	**8**	If contact insecticides are used as a control measure, this will undoubtedly affect any existing biological or integrated systems for control of other palm pests.
2.18 How likely are control measures to have other undesirable side-effects (for example, on human health or the environment)? *not likely = 1* *very likely = 9*	**5**	Sprayable contact insecticides used in public gardens accomodating palm trees might have undesirable side-effects on humans.
2.19 Is the pest likely to develop resistance to plant protection products? *not likely = 1* *very likely =9*		No data available.

After completing this section, the assessor should comment on whether sufficient information exists to trust the answers given; or if he/she knows of other relevant factors that have not been considered in this evaluation.		Sufficient information exists to trust the answers given above.

PEST RISK ASSESSMENT

Summary of section B, Quantitative evaluation

No.	Question	Score
	Entry	**Score**
1.1	How many pathways could the pest be carried on ?	1
1.3b	How likely is the pest to be associated with the pathway at origin ?	9
1.4	Is the concentration of the pest on the pathway at origin likely to be high ?	9
1.5b	How likely is the pest to survive existing cultivation or commercial practices ?	9
1.6	How likely is the pest to survive or remain undetected during existing phytosanitary procedures ?	8
1.7b	How likely is the pest to survive in transit ?	9
1.8	How likely is the pest to multiply during transit ?	1
1.9	How large is movement along the pathway ?	8
1.10	How widely is the commodity to be distributed through the PRA area ?	9
1.11	How widely spread in time is the arrival of different consignments ?	9
1.12b	How likely is the pest to be able to transfer from the pathway to a suitable host?	9
1.13	Is the intended use of the commodity likely to aid introduction ?	9
	Sum of entry potential =	90
	No. of questions answered =	12
	Mean of entry potential =	**7.5**
	Establishment	**Score**
1.14	How many host plant species are present in the PRA area?	8
1.15	How extensive are the host plants in the PRA area?	9
1.16	If an alternate host is needed to complete the life cycle, how extensive are such host plants in the PRA area?	-
1.17	If a vector is needed for dispersal, how likely is the pest to become associated with a suitable vector?	-
1.18	Has the pest been recorded on crops in protected conditions elsewhere?	-
1.19	How likely are wild plants to be significant in dispersal or maintenance of populations?	4
1.20	How similar are the climatic conditions that would affect pest establishment in the PRA area and in the area of origin?	7
1.21	How similar are other abiotic factors in the PRA area and in the area of origin?	-
1.22	How likely is the pest to have competition from existing species in the PRA area for its ecological niche?	7
1.23	How likely is establishment to be prevented by natural enemies already present in the PRA area?	8
1.24	If there are differences in the crop environment in the PRA area to that in the area of origin, are they likely to aid establishment?	1
1.25	Are the control measures which are already used against other pests during the growing of the crop likely to prevent establishment of the pest?	8
1.26	Is the reproductive strategy of the pest and duration of life cycle likely to aid establishment?	8
1.27	How likely are relatively low populations of the pest to become established?	9
1.28	How probable is it that the pest could be eradicated from the PRA area?	5
1.29	How genetically adaptable is the pest?	-
1.30	How often has the pest been introduced into new areas outside its original range?	3
	Sum of establishment potential =	77
	No. of questions answered =	12
	Mean of establishment potential =	**6.42**

Sum of entry and establishment potential =	167
No. questions answered =	24
Mean risk of entry and establishment =	**6.96**

	Economic Impact Assessment	**Score**
2.1	How important is economic loss caused by the pest within its existing geographic range?	9
2.2	How important is environmental damage caused by the pest within its existing geographic range?	8
2.3	How important is social damage caused by the pest within its existing geographic range?	-
2.4	How extensive is the part of the PRA area likely to suffer damage from the pest?	9
2.5	How rapidly is the pest liable to spread in the PRA area by natural means?	7
2.6	How rapidly is the pest liable to spread in the PRA area by human assistance?	9
2.7	How likely is it that the spread of the pest could be contained within the PRA area?	5
2.8	Considering the ecological conditions in the PRA area, how serious is the direct effect of the pest on crop yield and/or quality likely to be?	8
2.9	How likely is the pest to have a significant effect on producer profits due to changes in production costs, yields etc. in the PRA area?	8
2.10	How likely is the pest to have a significant effect on consumer demand in the PRA area?	8
2.11	How likely is the presence of the pest in the PRA area to affect export markets?	9
2.12	How important would other costs resulting from introduction be?	7
2.13	How important is the environmental damage likely to be in the PRA area?	3
2.14	How important is the social damage likely to be in the PRA area?	3
2.15	How probable is it that natural enemies, already present in the PRA area, will affect populations of the pest if introduced?	8
2.16	How easily can the pest be controlled?	7
2.17	How likely are control measures to disrupt existing biological or integrated systems for control of other pests?	8
2.18	How likely are control measures to have other undesirable side-effects ?	5
2.19	Is the pest likely to develop resistance to plant protection products?	-
	Total economic risk =	121
	No. questions answered =	17
	Mean risk of economic impact =	**7.12**

Risk of introduction (mean of entry and establishment)=	**6.96**
Risk of economic impact =	**7.12**

3. Final Evaluation

At the end of the procedure, the assessor will have at his disposal:
1) one or several sets of replies (1 to 9 scores) to questions 1.1 to 1.13, for one or several pathways (if no pathways have been retained, the probability of introduction will be zero);
2) one set of replies (1 to 9 scores) to questions 1.14 to 1.30;
3) one or several sets of replies (1 to 9 scores) to questions 2.1 to 2.19, for single, grouped or separate hosts (according to the manner of answering which has been chosen).

The assessor should first consider the quality of the information used to answer the questions, and give an overall judgement of how reliable the pest risk assessment can be considered. if other relevant information is available that has not been considered, this should be noted.

By the means of his choice, the assessor should attempt to make a separate estimate of the probability of introduction of the pest and its probable level of economic impact. As explained in the introduction, these estimates cannot, on the basis of the procedure used in the scheme be expressed in absolute units. the numerical scores may be combined, weighted and averaged in appropriate ways, that may enable the assessor who uses them consistently to make useful comparisons between pests, pathways and hosts. No particular mode of calculation is specifically recommended by EPPO. Certain questions have been identified as more important than others, and the assessor should take due account of this.

The assessor may then combine his estimates of probability of introduction and probable economic impact to formulate a single estimate of pest risk. This may usefully be compared with one or several reference levels of risk to decide whether the pest should be considered to be a quarantine pest, so that phytosanitary measures should be taken against it.

Finally, the scores given in answer to the different sections (particularly that on pathways) may be used again in pest risk management.

Conclusions: ***Paysandisia archon*** was first reported from Spain (and Europe) in March 2001. It was introduced from Argentina within imported palm trees. The larvae are palm-borers and therefore control or eradication of this pest is difficult. The affected palms may dye as a consequence of a heavy attack; if they survive, retarded growth and/or deformation of the stype/crown may occur. Control measures are not satisfactory as yet. Risk scores are quite high (7.5 for entry; 6.42 for establishment; 7.12 for economic impact). The trade movement of palm trees within the EU, mostly for ornamental purposes, is important. In Northern European countries, the pest larvae could survive the winter within their hostplants if these are kept indoors. Because of all the facts mentioned above as well as the high PRA scores, it would be advisable to give such an organism the status of quarantine pest within the EU.

References:

Aguilar, Ll., Miller, J.Y. & Sarto i Monteys, V., 2001.- A new lepidopteran family for the European fauna. *SHILAP Rvta. lepid.*, **29**(113): 86-87.

Chapin, É., Sarto i Monteys, V. & Hostachy, B. 2002.- *Paysandisia archon* (Burmeister, 1880): un ravageur des palmiers de la Mediterranée Occidentale. *Annales AFPP- Sixième Conférence Internationale sur les Ravageurs en Agriculture. Tome II*: 479-486

Drescher, J & Dufay, A., 2001.- Un nouveau ravageur des palmiers dans le sud de la France. *PHM Revue Horticole*, **429**: 48-50.

Drescher, J & Dufay, A., 2002.- Importation of mature palms: a threat to native and exotic palms in Mediterranean countries? *Palms*, **46**(4):179-184

Drescher, J & Jaubert, R., 2003.- *Paysandisia archon* continue sa progression. *PHM Revue Horticole*, **445**: 49-51.

Espinosa, B., Russo, G. & Muccio, DI P., 2003.- *Paysandisia archon*, una minaccia per le nostre palme. *L'Informatore Agrario*, **7/2003**: 61

Patton, S. & Perry, M., 2002.- *Paysandisia archon*- The First British Record. *Atropos*, **18**: 28, pl. 4: fig. 19, 20.

Reynaud, P., Chapin, É., Hostachy, B., Drescher, J., Blanchon, F.& Vidal, C., 2002.- Deux nouveaux papillons à l'assaut des palmiers de la Côte d'Azur. *Paysandisia archon* et *Pseudarenipses insularum*. *Phytoma - La Défense des Végétaux*, **550**: 18-21.

Sarto i Monteys, V., 2001.- Una nueva especie y familia de lepidópteros para Europa, plaga potencial de las palmeras. *II Congreso Nacional de Entomología Aplicada. VII Jornadas Científicas de la S.E.E.A.*: 78-79. Universidad Pública de Navarra. Pamplona

Sarto i Monteys, V., 2002. The discovery, description and taxonomy of *Paysandisia archon* (Burmeister, 1880), a castniid species recently found in southwestern Europe (Castniidae). *Nota lep.*, **25**(1): 3-15

Sarto i Monteys, V., 2003. Notes on *Paysandisia archon*. *Atropos*, **20**: 61-62

Sarto i Monteys, V. & Aguilar, Ll., 2001. *Paysandisia archon* (Burmeister, 1880), Castniidae, also in France. *SHILAP Revta. lepid.*, **29**(115): 280

Sarto i Monteys, V. & Aguilar, Ll., 2003. *Paysandisia archon* (Burmeister, 1880). L'eruga barrinadora de les palmeres. *Catalunya Rural i Agrària*, **102**: 39-40

Sarto i Monteys, V. & Aguilar, Ll.- The Castniid Palm Borer, *Paysandisia archon* (Burmeister, 1880) (Lep. Castniidae), in Europe: Comparative biology, pest status and possible control methods. *Nachrichten des Entomologischen Vereins Apollo* (in press)

Sarto i Monteys, V., Aguilar, Ll., Saiz-Ardanaz, M. & Martí, M.- Comparative morphology of the egg of the Castniid Palm Borer, *Paysandisia archon* (Lepidoptera: Castniidae). *Systematics and Biodiversity* (in press).