EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION
ЕВРОПЕЙСКАЯ И СРЕДИЗЕМНОМОРСКАЯ ОРГАНИЗАЦИЯ ПО КАРАНТИНУ И ЗАЩИТЕ РАСТЕНИЙ
ORGANIZATION EUROPEENNE ET MEDITERRANEENNE POUR LA PROTECTION DES PLANTES

04-10799
PPM point 8.8

PEST RISK ASSESSMENT SCHEME

Organism:	***Corythucha arcuata* (Say)**
Assessor(s):	**dr. Iris Bernardinelli**
Date:	**10th december 2003**
Approximate time spent on the assessment	**A few days (after 3 years of PhD research on host plants and ecology of this insect).**

PEST RISK ASSESSMENT

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 the 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** **Heteroptera** **Tingidae** ***Corythucha arcuata* (Say)**
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*		**Not applicable**
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. *go to 4*		**Europe**
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 Is the earlier PRA still entirely valid, or only partly valid (out of date, applied in different circumstances, for a similar but distinct pest)?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		**Not applicable**
6. Proceed with the assessment, but compare as much as possible with the earlier assessment. *go to 7*		**Not applicable**

STAGE 2: PEST RISK ASSESSMENT **Section A: Pest categorization (qualitative criteria of a quarantine pest)**		
Geographical criteria *This section considers the geographic 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**	**It has been reported in Northern Italy (Lombardy and Piedmont) and Turkey**
8. Is the pest of limited distribution in the PRA area? *Note: "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*	**No**	**At the moment, it occurs only in Italy and Turkey. In northern Italy the distribution in winter 2001 was about 7000 km^2 and in winter 2002 it was 11000 km^2, actually it is probably more widespread.** **It is also present in Turkey (Personal comunication of Dr. Serap Mutun – Bolu University and following pest identification).**
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 accidental/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 conditions or both? *if yes go to 10* *if no go to 22*	**Yes**	***Corythucha arcuata* host plants are a great number of deciduos oaks. In America, it lives on all the white oaks group (Connel and Beacher, 1947) and in Europe it has been found on: *Quercus robur, Q. pubescens, Q. petrea, Q. cerris, Q. frainetto.* It can develop also on *Rubus ulmifolius*, *Rubus ideaus* and *Castanea sativa* (Bernardinelli, 2003).**
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*	**No**	**All its life cycle is passed on a single host.**
11. Does the alternate host plant also occur in the same part of the PRA area as the major host plant ? *if yes go to 12* *if no go to 22*		**Not applicable**

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*	**No**	
13. Is the vector (or a similar species which is known or suspected to be a vector) present in the PRA area or likely to be introduced. 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*		**Not applicable**
14. Does the known geographical distribution of the pest include ecoclimatic zones comparable with those of the PRA area? *if yes go to 18* *if no go to 15*	**Yes**	**In America, its distribution ranges from latitude of about 50° to latitude of about 30° and this insect is spread everywhere there are oaks. So that in the PRA area the ecoclimatic zone of the insect could be almost all Europe where deciduos oaks are spread (see the attached picture).**
15. Is it probable, nevertheless, that the pest could survive and thrive in a wider ecoclimatic zone that could include the PRA area? ***if yes go to 18 if no go to 16***	**Yes**	**The pest already occurs in the PRA area.**
16. Could the ecoclimatic requirements of the pest be found in protected conditions in the PRA area? ***if yes go to 17 if no go to 22***		**Not applicable**
17. Is a host plant grown in protected conditions in the PRA area? ***if yes go to 18*** *if no go to 22*		**Not applicable**

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 also be allowed for.
In deciding whether economically important damage or loss to plants may occur, it is necessary to consider whether climatic 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*	**No**	**It can cause late summer defoliation in oaks strongly infested with a reduction in timber production. From American literature tree death has never been reported (Connel and Beacher, 1947). Strong infestation occurs occasionally in natural stands.**
19. Could the pest, nevertheless, cause significant damage or loss in the PRA area, considering ecoclimatic and other factors for damage expression? *if yes go to 21*	**No**	**In northern Italy there are 2 and a partial 3rd generation per year.** **Eggs are laid in clusters and the average number of eggs per cluster is greater in Italy than in the USA.**

if no go to 20		**(Bernardinelli, 2003).**
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*	**No**	**Considering the main infested species, the insect should not have a negative impact at any level. From the environmental point of view, the European oaks are actually getting a lot of other worse phytosanitary problems.**
21. This pest could present a risk to the PRA area **NO (anyway some parts of the section B are filled)** **Go To Section B**		
22. This pest does not qualify as a quarantine pest for the PRA area 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 categorization as a possible quarantine pest. In this latter case, seek a second opinion to decide whether the answers which led you to this point could be given a different reply.*		

<u>Section B</u>: 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 an assessment of the likely economic impact if that should happen. From these two aspects, it should be possible to consider 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 check-list of EPPO (OEPP/EPPO, 1993a) 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 a pest resulting in its establishment.

Entry

List the pathways that the pest could be carried on. *<u>Note</u>: 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.*		**_Corythucha arcuata_ is a small insect that overwinters as an adult in loose barks, under the leaves, so it can be easily transferred from infested areas with the wood, not necessarily oak wood.** **In spring and summer it can be transported with living oaks.**
1.1 How many pathways could the pest be carried on? *few = 1* *many = 9*		**The possible pathways are represented by:** ▪ **Wood of _Quercus_ sp.** ▪ **Plants of _Quercus_ sp. (currently the importation of _Quercus_ plants with leaves is prohibited)** ▪ **Plants of _Rubus_ sp. (hypothetical)** ▪ **Plants of _Castanea_ (hypothetical)** **In laboratory conditions the insect can develop on some species of _Rubus_ and in a lower number on _Castanea sativa_.** **In field conditions a small number of eggs, few nymphs and a lot of overwintering adults have been found on _Rubus ulmifolius_.** **In US it's known to have as an occasional host plant _Castanea_ sp., but there are non records on _Rubus_ species.**
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 – 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*		**The reply is positive, considering that the insect was introduced.**
1.3b How likely is the pest to be associated with the pathway at origin? [i.e. are all areas infested or highly infested; will every consignment or part of it be infested?] *not likely = 1* *very likely = 9*		
1.4 Is the concentration of the pest on the pathway at origin likely to be high? [i.e. will there be many individuals associated with the consignment?] *not likely = 1* *very likely = 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*		
1.5b How likely is the pest to survive existing cultivation or commercial practices? *not likely = 1* *very likely = 9*		
1.6 How likely is the pest to survive or remain undetected during existing phytosanitary procedures? *Note: 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.*		**Adult insect on wood are very difficult to detect, in particular because they are often isolated or in very small groups under barks, in small cracks of the wood or in other overwintering sites.** **In summer, the insect is evident on the lower part of the leaves, but *Corythucha arcuata* is quite similar to**

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*		***Corythucha ciliata* and *Stephanitis pyri* that are widespread in Italy.** **In green plants, young stages are very visible because they live in large groups.**
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**	**Overwintering adults usually look for a place to protect themselves, so they can survive in cold conditions without problems for long periods.**
1.7b How likely is the pest to survive in transit? *not likely = 1* *very likely = 9*		***Corythucha arcuata* can easily survive during transit as an adult and, when it is introduced in a new place, it can find oaks and a place to reproduce.**
1.8 Is the pest likely to multiply during transit? *not likely = 1* *very likely = 9*		**The insect cannot multiply during the transit, apart from plants with living leaves whose import is prohibited in EU..**
1.9 How large is movement along the pathway? [i.e. how much trade?] *not large = 1* *very large = 9*		

1.10 How widely is the commodity to be distributed throughout the PRA area? *Note: the more scattered the destinations, the more likely it is that the pest might find suitable habitats.* *not widely = 1* *very widely = 9*		**Oaks are a common plant in many countries of the PRA area (see the attached picture).**
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*		
1.12a Could the pest transfer from the pathway to a suitable host? *Note: 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**	
1.12b How likely is the pest to be able to transfer from the pathway to a suitable host? *not likely = 1* *very likely = 9*		**Adults of *Corythucha arcuata* can easily fly to find a host plant where they can feed and multiply.**
1.13 Is the intended use of the commodity (e.g. processing, consumption, planting, disposal of waste) likely to aid introduction? *Note: 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*		
ESTABLISHMENT		
1.14 How many host-plant species are present in the PRA area? *one or very few = 1* *many = 9*		***Corythucha arcuata* host plants are oaks: *Quercus robur, Q. pubescens, Q.petrea, Q. cerris* and *Q. frainetto.*** **In laboratory conditions the insect can develop also on *Rubus ulmifolius* gr., *Rubus ideaus* with the same rate observed on most of the *Quercus,* but in field less eggs are layed. A lower rate of insects can develop in laboratory on *Castanea sativa* (Bernardinelli, 2003).**

1.15 How extensive are the host plants in the PRA area? *rare = 1* *widespread = 9*		**See the attached picture**
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*		
1.17 *[1]If a vector is needed for dispersal, how likely is the pest to become associated with a suitable vector? *Note: is the vector present in the PRA area, could it be introduced or could another vector be found?* *not likely = 1* *very likely = 9*		
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*		***Quercus* spp. and *Rubus* spp. are quite common plant in northern Europe.**
1.20 *How similar are the climatic conditions that would affect pest establishment in the endangered 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*		**In north America *Corythucha arcuata* occurs in U.S. (Maine, New Hampshire, Massachussetts, Vermont, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, Delaware, North Carolina, South Carolina, Georgia, Alabama, Mississipi, Ohio, Illinois, Indiana, Montana, Michigan, Wisconsin, Nebrasca, Minnesota, Iowa, North Dakota, South Dakota, Colorado, Utah, Arizona, New Mexico, Texas) and in Canada (Quebec, Ontario) (Drake e Ruhoff, 1965).** **With such a widespread pest, it is easy to find similar conditions in PRA area.**

[1] Questions marked with an asterisk are to be considered as more important than the others in the same section.

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.* *not similar = 1* *very similar = 9*		
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*		
1.23 How likely is establishment to be prevented by natural enemies already present in the PRA area? *very likely = 1* *not likely = 9*		**In northern Italy, there are only generic predators that feed on *Corythucha arcuata* in investigated area. In woods conditions they belong to quite a lot of different genera, while in urban conditions the situation can be different. No parassitoids are actually known for this insect.**
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? *Note: 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*		***Corythucha arcuata* lives in oak stands, wood and forests, and there are no particular differences from American situation.**
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*		***Corythucha arcuata* is already established**
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*		**The development of young stages varies from 20 to 23 days on European oaks on *Rubus* spp. and it takes about 27 days on *Castanea*.** **In Italy, the number of lied eggs on *Quercus robur* is greater than in the USA (Bernardinelli, 2003).**
1.27 How likely are relatively low populations of the pest to become established? *not likely = 1* *very likely = 9*		
1.28 How probable is it that the pest could be eradicated from the		**It is spread on over 11000 square kilometres in northern**

PRA area ? *very likely = 1* *not likely = 9*		**Italy and probably in Switzerland (Bernardinelli, 2003).** **It is also present in Turkey** **It is nearly impossible to eradicate an insect which has already established**
1.29 How genetically adaptable is the pest? *Note: 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*		
1.30 *How often has the pest been introduced into new areas outside its original range? *Note: 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*		**As far as it is known, it has been introduced in Italy and in Turkey.**

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 judgement 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*		**The only evident damage are the yellow leaves and their wilting in late summer, where there are strong infestations. This can cause a reduction in timber production.**
2.2 How important is environmental damage caused by the pest within its existing geographic range? *Note: environmental damage may be impact on ecosystem health, such as effects on endangered/threatened species, keystone species or*		**No any environmental damage is reported up to date in northern Italy. In some strongly infested areas, the situation of oak decline is getting worse (near Milan – Parco Ticino and Parco Groane). It is not clear the importance of**

biodiversity. *little importance = 1* *very important = 9*		***Corythucha arcuata* in this process, but frequent anticipated defoliations can reduce oaks health.**
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*		**No social damages derive from the pest occurring.**
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 ecoclimatically, geographically, by crop or by production system (e.g. protected cultivation).* *very limited = 1* *whole PRA area = 9*		***Corythucha arcuata* can develop in the greatest part of the PRA area, where non evergreen oaks are present.**
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*		**This insect is very small and it is not a good flyer, but due to its size it can be easily spread by human action.** **It is almost impossible to eradicate this insect because it is widespread in northern Italy and in Turkey.**
2.6 How rapidly is the pest liable to spread in the PRA area by human assistance? *very slowly = 1* *very rapidly = 9*		
2.7 How likely is it that the spread of the pest could be contained within the PRA area? *Note: 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*		
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? *Note: 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*		
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*		
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*		
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*		
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*		
2.13 How important is the environmental damage likely to be in the PRA area? *little importance = 1* *very important = 9*		**If oaks are strongly infested in late summer, they can be completely defoliated.**
2.14 How important is the social damage likely to be in the PRA area? *little importance = 1* *very important = 9*		
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*		**Actually only generic predators, without a strong reduction effect on *Corythucha arcuata* population, are present.** **No egg parassitoids are known.**
2.16 How easily can the pest be controlled? *Note: difficulty of control can result from such factors as lack of effective*		**In natural stands (woods and forests), no control is possible.** **In cities, it can be controlled like *Corythucha ciliata* on**

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*		***Platanus* sp. on amenity trees**
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*		
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*		
2.19 Is the pest likely to develop resistance to plant protection products? *not likely = 1* *very likely = 9*		
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		

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 1.1-1.13, 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 1.14-1.30;
(3) one or several sets of replies (1-to-9 scores) to questions 2.1-2.19, for single, grouped or separate hosts (according to the manner of answering which has been chosen).

The assessor should first consider the quality and quantity 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.

References

Bernardinelli I, 2003 - PhD Thesis: Piante ospiti e altri aspetti ecologici di *Corythucha arcuata* (Say) (Heteroptera: Tingidae) [Host palnts and other ecological aspects of *Corythucha arcuata* (Say) (Heteroptera: Tingidae)]- Dipartimanto di Biologia applicata alla Difesa delle Piante, Università degli Studi di Udine, 81pp.

Connel W.A., Beacher J.H. (1947) – Life history and control of the oak lace bug. Del. agric. Exp. Sta., Bull. n. 265: 28 pp.

Other literature on the topic

Bernardinelli I., Zandigiacomo P., (2000) – Prima segnalazione di *Corythucha arcuata* (Say) (Heteroptera, Tingidae) in Europa. Informatore Fitopatologico, 50 (12): 47-49.

Connor E.F. (1988) – Plant water deficit and insect responses: the preference of *Corythucha arcuata* (Heteroptera: Tingidae) for the foliage of white oak, *Quercus alba*. Ecological Entomology, 13: 375-381.

Drake C.J., Ruhoff F.A. (1965) – Lacebugs of the world: a catalog (Hemiptera: Tingidae). Smithsonian Institution, United States National Museum, Washington, Bull. n. 243, viii + 634 pp.

Drew W.A., Arnold Don C. (1977) – Tingoidea of Oklahoma (Hemiptera). Proceedings of the Oklahoma Academy of Science, 57: 29-31.

Fenaroli L. (1984) – Guida agli alberi d'Italia. Giunti Martello, Firenze: 256 pp.

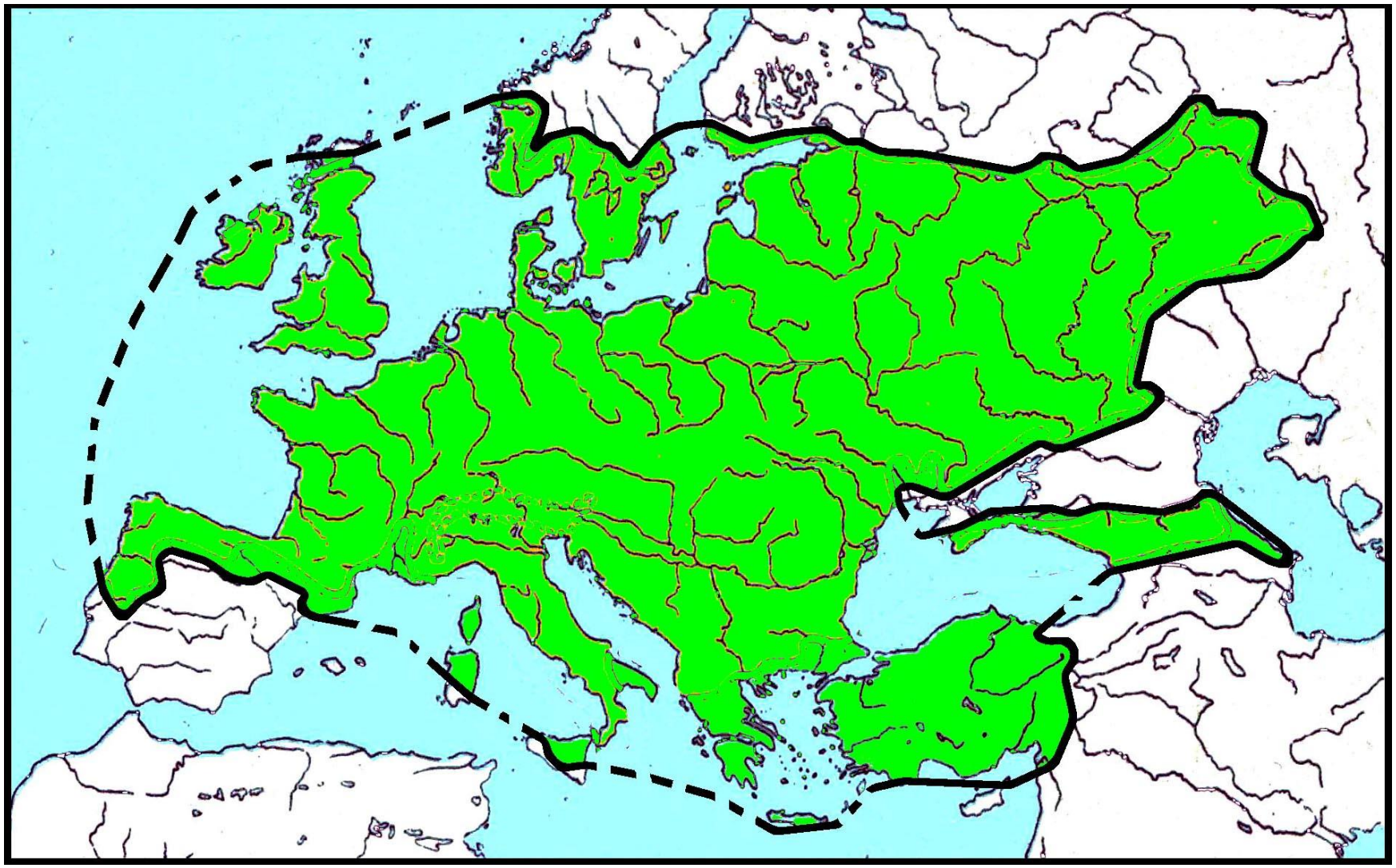
Gibson E.H. (1918) – The genus Corythucha Stal (Tingidae; Heteroptera). Trans. Amer. Entomol. Soc., 44: 69-104.

Kerr T.W. (1950) – Insecticides for control of certain insects attacking ornamental trees and shrubs. J. Econ. Entomol., 43 (1): 63-65.

Péricart J. (1983) – Hemipteres Tingidae Euro-Mediterraneens. Faune de France, France et regions limitrophes, Vol. 69. FFSSN, Paris, x + 618 pp.

Sparks B., Braman K., Baldson J. (1994) – Control of lace bugs on ornamental plants. The University of Georgia, College of Agricultural & Environmental Sciences, Cooperative Extension Service, Bull. n. 1102: 2 pp.

ALLEGATO I



European distribution of the oaks where *Corythucha arcuata* may develop (Bernardinelli, 2003).