*Ente Nazionale Risi – Rice Research Centre - Italy*
04/10795
P PM Point 6.2.3

# Report of a Pest Risk Assessment: *Aphelenchoides besseyi* (Christie)

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| **Pest:** | *Aphelenchoides besseyi* (Christie) (Nematoda; Aphelenchida)<br>Rice white tip nematode, strawberry crimp disease nematode |
| **PRA area:** | European Union, in particular the Countries which grow rice: Italy, France, Greece, Portugal and Spain |
| **Assessors:** | Maria Luisa GIUDICI & Anna CALLEGARIN |
| **Date:** | 5th June 2003 |
| **Summary of the conclusions** | Low risk for the EPPO region |
| **Status of the pest** | The pest has quarantine status. |
| **Further action** | Re-categorising as non-quarantine pest |

## 1. INITIATION

**1.1 Reason for doing PRA**: *Aphelenchoides besseyi* is a quarantine pest for EU. This pest does not qualify as a quarantine pest for the PRA area, taking into consideration that *Aphelenchoides besseyi* was first detected in Italy in 1997 and that neither in Italy nor in other countries (EU and extra-EU countries) sowing Italian seed, negative economic impacts have ever been reported since 1997 or even before. Moreover six years long experience suggests that the presence of low populations of *Aphelenchoides besseyi* does not cause negative impacts of any kind.

**1.2 Taxonomic position of pest:** Class Nematoda; Order Aphelenchida; Family Aphelenchoididae

## 2. PROBABILITY OF INTRODUCTION

**2.1 Entry**

**2.1.1 Geographical distribution:**

PRA area: present

Geographical distribution (CABI/EPPO, 1997; CABI/EPPO, 1998)

EPPO region: Bulgaria, France, Hungary, Italy, Russia, Slovakia.

Africa: Benin, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Chad, Comoros, Cote d'Ivoire, Egypt, Gabon, Gambia, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe.

Asia: Afghanistan, Azerbaijan, Bangladesh, Cambodia, China, India, Indonesia, Iran, Israel, Japan, Korea Republic, Lao, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Tajikistan, Thailand, Uzbekistan, Viet Nam.

North America: Mexico, USA (Arizona, California, Florida, Hawaii, Louisiana, Texas).

Central America and Caribbean: Cuba, Dominica, Dominican Republic, El Salvador, Guadeloupe, Panama.

South America: Argentina, Brazil, Ecuador.

Oceania: Australia, Fiji.

**2.1.2 Major host plants:** *Oryza sativa* L., *Fragari*a *vesca* L.

**2.1.3 Which pathway(s) is the pest likely to be introduced on:**

The nematode can be introduced by the following possible pathways :

- Seed
- Paddy rice (if sown by the farm instead of using certified seed)

**2.2 Establishment**

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| **2.2.1 Crops at risk in the PRA area:** | Rice (the total rice growing area in EU is 400.000 ha.)<br>Strawberry |
| **2.2.2 Climatic similarity of present distribution with PRA area (or parts thereof):** | The climate in the rice growing area in Europe is temperate. In France and Portugal climate is similar to Italian one, in Spain and Greece is warmer.<br>The rice European regions are located between 35° and 45° North latitude. This is the climatic limit for cultivation of rice, that is originally a tropical species. One crop per year is grown, from April to October.<br>*Aphelenchoides besseyi* is a parasite of warm regions, according to EPPO it is not found behind latitude 43° N on rice and 40° N on strawberry. In tropical countries second growth of the crop and irrigation water can be contaminated and may initiate infestation especially when the prevailing temperature is between 20° and 40° C. In fact the optimum temperature for *Aphelenchoides besseyi* development is 28 °C and the marginal temperature are 13 °C and 42 °C (Gergon. E.B. and Misra J.K., 1992). |
| **2.2.3 Aspects of the pest's biology that would favour establishment:** | *Aphelenchoides besseyi* can be dispersed from infested seed by irrigation water. It can infest weeds but they are not an important way of transmission. *Aphelenchoides besseyi* does not survive in soil. |
| **2.2.4 Characteristics (other than climatic) of the PRA area that would favour establishment:** | - |
| **2.2.5 Which part of the PRA area is the endangered area:** | The total rice area in EU is 400.000 ha. |

**3. ECONOMIC IMPACT ASSESSMENT**

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| **3.1 Describe damage to potential hosts in PRA area:** | The conditions in the PRA area (temperate climate, flooded field, tolerant varieties) are adequate for pest survival but are not suitable for significant damage on the host plant. |
| **3.2 How much economic impact does the pest have in its present distribution:** | *Aphelenchoides besseyi* was first detected in Italy in 1997. Since then negative economic impacts have never been reported in Italy and other EU and extra-EU countries sowing Italian seed. |
| **3.3 How much economic impact would the pest have in the PRA area:** | The rice area is not likely to extend, on the contrary will probably decrease in the near future. The cultivation of rice in flooded field is likely to prevent establishment of the pest. |

**4. CONCLUSIONS OF PRA**

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| **4.1 Summarize the major factors that influence the acceptability of the risk from this pest:** | The conditions in the PRA area are adequate for pest survival but are not suitable for significant damage on the host plant.<br>*Aphelenchoides besseyi* was first detected in Italy in 1997. Since then negative economic impacts have never been reported in Italy and other EU and extra-EU countries sowing Italian seed.<br>Experimental trials confirmed that a low population density of *Aphelenchoides besseyi* in rice seed (less than 30 nematode/100 seeds) does not cause significant damage or loss in rice flooded crop, which is the ordinary cultural practice in EU countries.<br>The chance is very low that the pest could spread reaching high level of infestation due to the ecoclimatic and agronomic conditions (temperate area, flooded crop, use of certified seed).<br>At present there is no need of using chemicals which would cause negative environmental impacts. It is worth noting that no chemicals are registered in the European Union to treat rice seed.<br>A hot water treatment could be recommended for foundation seed and for all seed lots exchanged for scientific research purposes. |

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| **4.2 Estimate the probability of entry:** | Already present. |
| **4.3 Estimate the probability of establishment:** | Already present. |
| **4.4 Estimate the potential economic impact:** | Low |
| **4.5 Degree of uncertainty** | The reliability of this pest risk assessment is considered very high: most of the questions were answered on the basis of actual facts rather than on estimate of a probability.<br>The information used to answer the questions were obtained from 6 years results of:<br>• analysis of rice seed (testing of all lots);<br>• experimental research concerning: crop damage, varietal vulnerability, pest survival in the field, control methods, detection methods, host symptoms;<br>• inspection of rice field by phytosanitary authority, extension service and seed certification authority. |
| **5. OVERALL CONCLUSIONS OF THE ASSESSORS** | This pest does not qualify as a quarantine pest for the PRA area.<br>A tolerance limit (less than 30 nematode/100 seeds) could be fixed for *Aphelenchoides besseyi* in rice seed. |