

DATABASE OF QUARANTINE NEMATODES TO BRAZILIAN AGRICULTURE



Recursos Genéticos e Biotecnologia

Renata Cesar Vilardi Tenente¹;
Ailton Rocha Monteiro²;
Mauro Sergio Munhoz Tenente¹
Gabriela Cesar Munhoz Vilardi Tenente¹

¹ EMBRAPA Recursos Genéticos e Biotecnologia
Caixa Postal 02372, Brasília, DF, Brazil
renata@cenargen.embrapa.br



Ministério da Agricultura e do Abastecimento

² ESALQ / USP

Caixa Postal 09, Piracicaba, SP, Brazil

INTRODUCTION

The picture of the global international trade among countries and economic blocks is facing new facts, as the exchange of goods tends to rise. Due to this many countries, specially the ones that signed the World Trade Organisation (WTO) Protocols, are implementing better safety procedures which enforce strong phytosanitary measures. It may happen that the stronger and more aggressive countries will try to force down their measures. Such situation may lead to a series of risk of entry, establishment and spread of exotic pests (including nematodes) in production areas of the imported country. This shows the importance of technical arguments that will be used as technical trade barriers and the strengthening of national measures to provide higher levels of protection more relevant to international standards.



As Brazil is a member of "Mercado Comum do Cone Sul" (MERCOSUL Common Market of South Trade) and countersigned the International Plant Protection Convention (IPPC), the rights and obligations regarding international trade derive mainly from the WTO Agreement on the Application of Sanitary and Phytosanitary Measures. Other WTO Agreements such as the Technical Barriers to Trade Agreement may also be relevant in certain circumstances. The IPPC is recognised by the WTO under the Application of Sanitary and Phytosanitary Measures as the convention under which international standards for phytosanitary measures are developed. Brazil is represented by the National Phytosanitary Protection Committee (NPPC) of the Agricultural Defence Secretary (ADS) of the Ministry of Agriculture and Food Supply (MA) and their main objectives regarding international trades are:

- Exclusion of Exotic Plants and Pests.
- Pests Detection.
- Establishment of Integrated Pest Management Programs.
- Improvement of International Trade of Commodities.

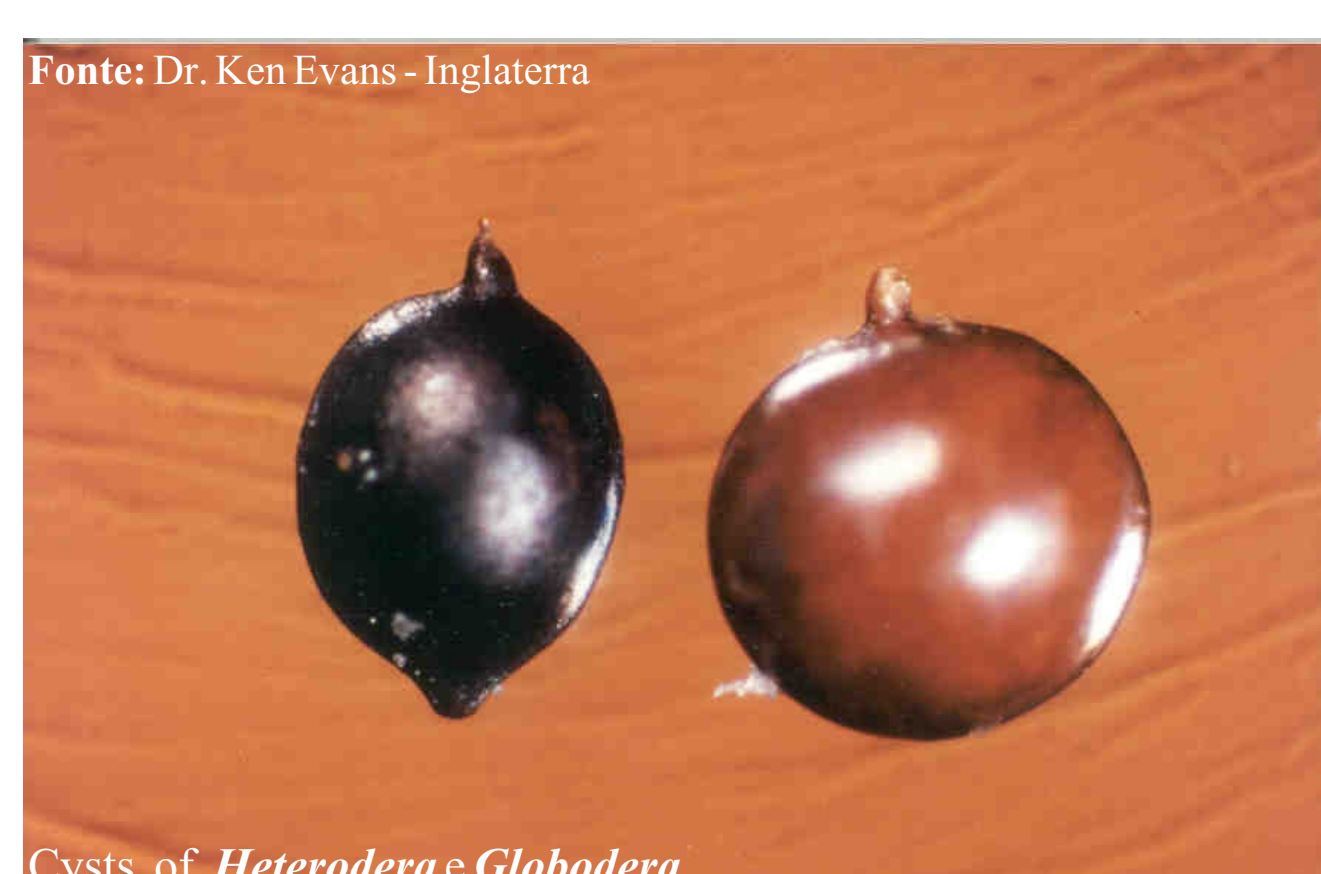
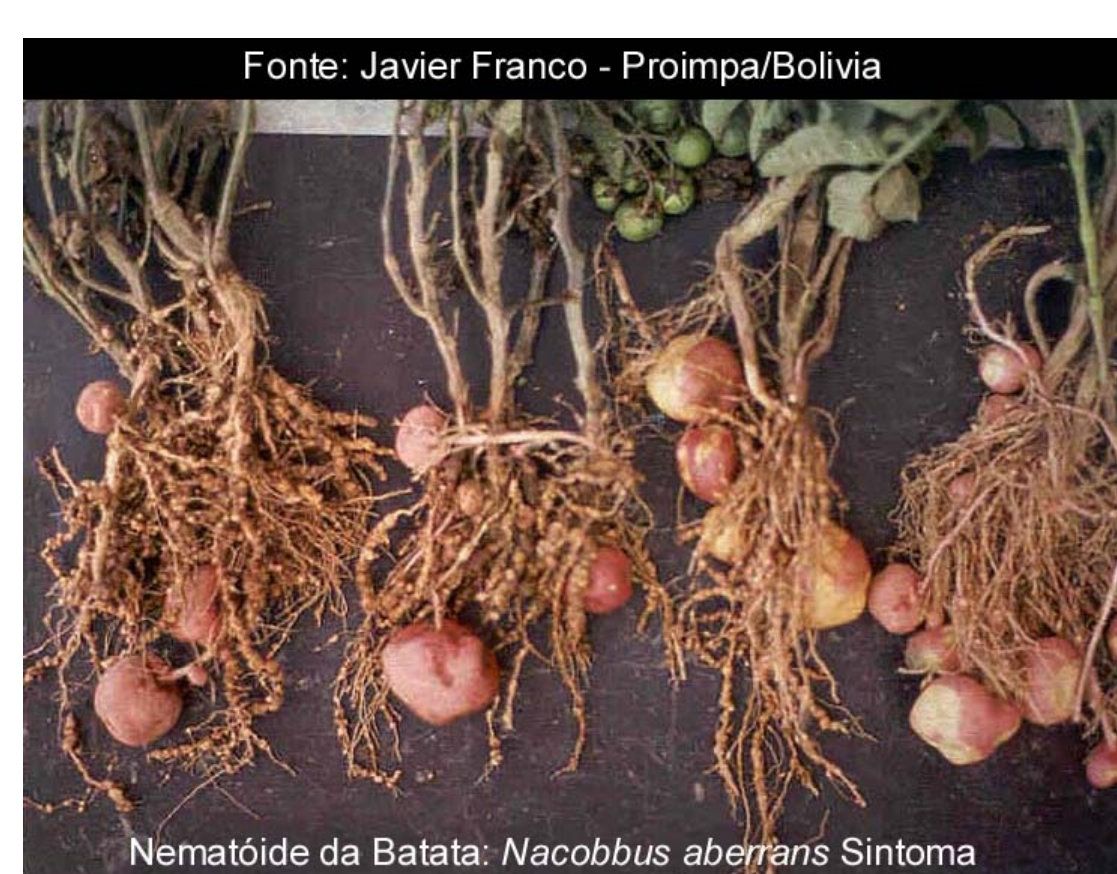
As NPPC / ADS is responsible for implementing phytosanitary measures for Brazil and also the protection natural fauna and flora, they propose activities that are being improved by the following steps:

- Removal or reduction of quarantine restrictions on imports, when consistent with appropriate risk management based on technical advise;
- Application of phytosanitary measures, at the country's borders, based on the international standards and guidelines;
- Changes or/and reviews of established policies, having the support of a technical team of exports;
- Informatization of biological data to support quarantine services, such as inspection and detection of pests.

Therefore, the creation of a computerised database was requested and this is under development by the Plant Quarantine Laboratory of "Empresa Brasileira de Pesquisa Agropecuária" (EMBRAPA - Brazilian Agricultural Enterprise).

OBJECTIVE

The aim is to create a computer database of biological information of exotic pests and display information on quarantine pests to Brazil through a computer system that is being developed and which will allow to search through the name of the pest, host plant or country of origin, as well as other aspects. This dataset will be used by customs offices and quarantine institutions in Brazil mainly for the detection of non-existing pest in the country.



MATERIALS AND METHODS

According to FAO (1997), pest is any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products and quarantine pest are of potential economic importance to the area endangered there by and not yet present there, or present but not widely distributed and being officially controlled.

According to "Comitê de Sanidade Vegetal dos Países do Cone Sul" (COSAVE - Plant Phytosanitary Committee of South Trade) quarantine pests can be divided into two categories:

- if it is not yet present in a country;
- present but not widely distributed and being officially controlled.

Biological information has been gathered on a number of quarantine nematodes associated with the following hosts: **Barley, Corn, Potato, Rice, and Wheat.**

Biological data is available on:

- nomenclature, taxonomic position, common names;
- biogeology, morphology, geographical distribution;
- host range, symptoms and signs;
- movement and dispersal;
- damage and loss;
- detection, identification, diagnosis and
- quarantine aspects of these parasites.

The project should continue to complete the A1 and A2 lists, as stated by COSAVE. It is important to mention that these lists are not static because the pests can be eliminated from determined area or can be introduced in new part of the country. COSAVE is continually checking the names of the pests on the lists.

RESULTS

The results of this work are shown in the Table 1, which presents the important nematodes for the first five plants, being of economic importance to Brazil:

- Barley, (*Hordeum vulgare*)
- Corn, (*Zea mays*)
- Potato, (*Solanum tuberosum*)
- Rice, (*Oryza sativa*)
- Wheat, (*Triticum aestivum*)

The listed nematodes are also very important plant parasitic for the economy in different countries, such as:

- Ditylenchus* spp., *Globodera* spp., *Heterodera* spp., *Meloidogyne* spp., *Nacobbus* spp., *Pratylenchus* spp. and other genera.

The results also include an introductory picture of the pests, morphology figures, drawing of the life cycles, photographs of symptoms in the exchanged plant materials (see figures 1 to 4).

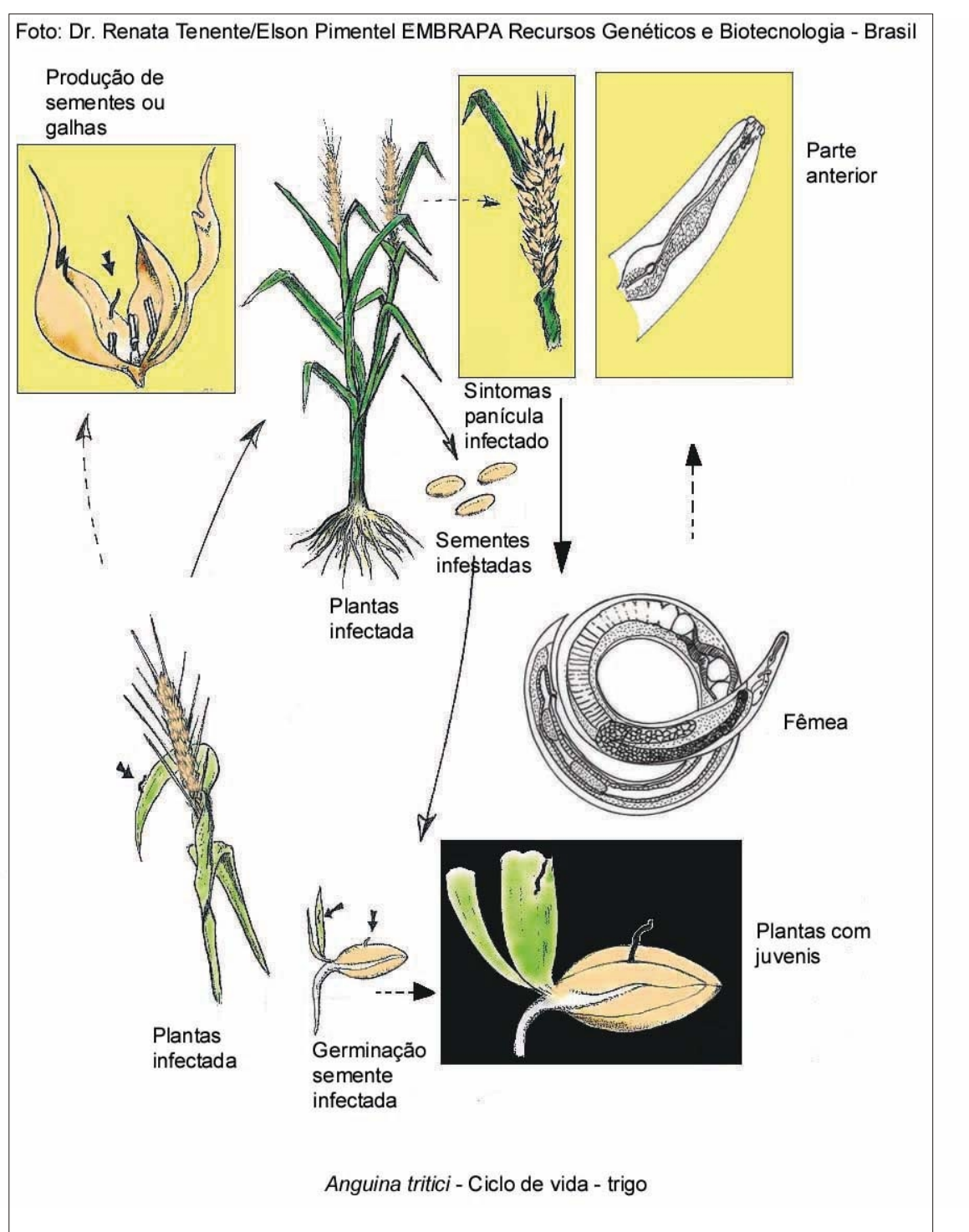
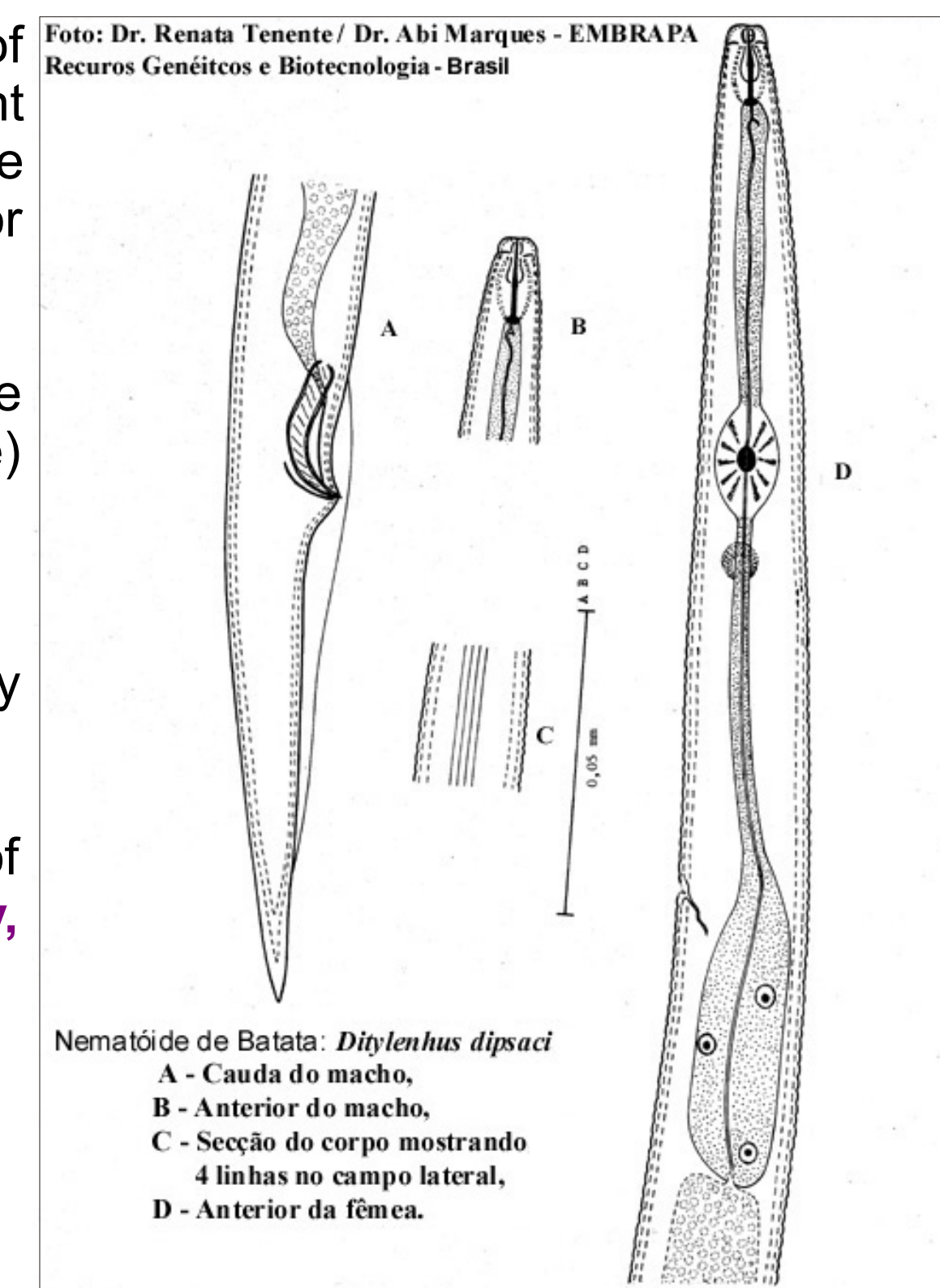


TABLE 1 - Plant-Parasitic Nematodes of A1 lists that have already been included in the database.

Pathogen	Taxonomic Classification			Main Host Plant
	Class	Order	Family	
<i>Anguina tritici</i>	Secernentea	Anguinidae	Anguinidae	Wheat
<i>Ditylenchus angustus</i>	Secernentea	Anguinidae	Anguinidae	Rice
<i>Ditylenchus destructor</i>	Secernentea	Tylenchida	Anguinidae	Potato
<i>Ditylenchus dipsaci</i>	Secernentea	Tylenchida	Anguinidae	Barley, Corn, Potato, Wheat
<i>Globodera pallida</i>	Secernentea	Tylenchida	Heteroderidae	Potato
<i>Globodera rostochiensis</i>	Secernentea	Tylenchida	Heteroderidae	Potato
<i>Heterodera avenae</i>	Secernentea	Tylenchida	Heteroderidae	Barley, Wheat
<i>Meloidogyne chitwoodi</i>	Secernentea	Tylenchida	Heteroderidae	Potato
<i>Nacobbus aberrans</i>	Secernentea	Tylenchida	Pratylenchidae	Potato
<i>Nacobbus dorsalis</i>	Secernentea	Tylenchida	Pratylenchidae	Potato
<i>Pratylenchus scribneri</i>	Secernentea	Tylenchida	Pratylenchidae	Barley, Corn, Potato
<i>Pratylenchus thornei</i>	Secernentea	Tylenchida	Pratylenchidae	Barley, Wheat
<i>Punctodera chalconis</i>	Secernentea	Tylenchida	Heteroderidae	Corn

CONCLUSIONS

This dataset will effectively collaborate in the reduction of the introduction of new species of nematodes into Brazil, as well as to improve the knowledge of the personnel at customs offices regarding the danger of new pests introduction.