



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

CANADIAN FOOD INSPECTION AGENCY 59 Camelot Drive Ottawa, Ontario K1A 0Y9 Tel: 613-225-2542-: FAX: 613-773- 7204	RMD-11-02 (consultation)
	February 15, 2011
Pest Risk Management Discussion Document for <i>Heterodera glycines</i> Ichinohe (Soybean Cyst Nematode)	

Preface

As described by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) includes three stages: initiation, pest risk assessment and pest risk management. Initiating the PRA process involves identifying pests and pathways of concern and defining the PRA area. Pest risk assessment provides the scientific basis for the overall management of risk. Pest risk management is the process of identifying and evaluating potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels and selecting appropriate measures.

This Risk Management Document (RMD) includes a summary of the findings of a pest risk assessment and records the pest risk management process for the identified issue. It is consistent with the principles, terminology and guidelines provided in the IPPC standards for pest risk analysis which may be found at <https://www.ippc.int/>.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1.0 PURPOSE.....	6
2.0 SCOPE	6
3.0 DEFINITIONS.....	6
4.0 BACKGROUND	6
5.0 PEST RISK ASSESSMENT SUMMARY (2010)	8
6.0 RISK MANAGEMENT CONSIDERATIONS.....	10
6.1 Standards of the International Plant Protection Convention (IPPC).....	10
7.0 PEST RISK MANAGEMENT	12
7.1 Considerations.....	12
7.1.1. <i>Domestic movement regulations</i>	12
7.1.2. <i>Spread by natural pathways</i>	12
7.1.3. <i>Soil surveys</i>	12
7.1.4. <i>Enforcement requirements on infested fields</i>	13
7.2 Proposed Approach.....	13
7.2.1 <i>Impact on exports and imports</i>	14
8.0 RISK MANAGEMENT DECISION	15
8.1 Decision	15
8.2 Next Steps	15
9.0 REFERENCES	15
APPENDIX A - PEST RISK MANAGEMENT OPTIONS CONSIDERED	15

EXECUTIVE SUMMARY

As described by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) includes three stages: initiation, pest risk assessment and pest risk management. The Risk Management Discussion document (RMD) is part of the pest risk management stage. This RMD includes a summary of the findings of a pest risk assessment and records the pest risk management process for the identified issue. Consultation on the RMD, from a range of potentially affected stakeholders, is a key step prior to the approval and implementation of regulatory changes to the status of a pest.

Heterodera glycines, the soybean cyst nematode, is on the “List of Pests Regulated by Canada”. Schedule II of the *Plant Protection Regulations* restricts the domestic movement of soybean seed for propagation, soybean harvesting equipment, machinery, soil and any other thing suspected of being infested with the pest. To prevent the introduction, the Canadian Food Inspection Agency (CFIA) regulates imports of soybean seed, potatoes, root crops, and soil and soil-related matter, alone or in association with plants. Soybean cyst nematode is one of the most destructive pests of soybean. Soil is the only significant pathway for the movement of this pest. Plant commodities, farm equipment and natural means such as, water, air and bird, also move infested soil.

The 2010 Pest Risk Assessment for *H. glycines* determined that the overall risk was “low” and supported the possibility of deregulation. In Canada, surveys have detected this nematode in most Ontario soybean producing counties, since the first detection in Kent County in 1987. *Heterodera glycines* infested counties account for about 75% of the soybeans produced in Ontario and one half of Canadian soybean production.

The biology of *H. glycines* indicates that cryptic spread is ongoing both within the province of Ontario and potentially to other regions. The United States (U.S.) has not regulated this pest since 1972, either at the federal or state level, because domestic regulations and movement restrictions were unsuccessful in preventing the spread. The nematode has been effectively managed through the use of best management practices, including crop rotation with non-host crops and planting resistant soybean varieties.

Risk management consideration was given to the following: 1) The challenges in enforcing domestic movement regulations to prevent spread of the pest from infested areas; 2) The lack of control over the natural spread of the pest; 3) The challenges in meeting our obligations under the IPPC due to discrepancy over strict import requirements versus limitations in enforcing domestic movement requirements; 4) Limitation of soil surveys to map the distribution of the pest; and 5) Highly expensive and resource intensive quarantine measures to be enforced if *status quo* is to be maintained. The CFIA is proposing deregulation of *H. glycines* in Canada. The proposed deregulation is not expected to cause any significant market access issues, as most of our trading partners, including the USA, have de-regulated this pest.

1.0 PURPOSE

To propose de-regulation of *Heterodera glycines*, the soybean cyst nematode, in Canada.

2.0 SCOPE

This pest risk management discussion document pertains to Canada's policies (plant import and domestic movement) to address the risks from *H. glycines*.

3.0 DEFINITIONS

Definitions for terms used in the present document can be found in the Plant Health Glossary of Terms at:

<http://www.inspection.gc.ca/english/plaveg/protect/dir/glosterme.shtml>.

4.0 BACKGROUND

Heterodera glycines is on the “List of Pests Regulated by Canada”. It is also listed on Schedule II of the *Plant Protection Regulations*, which states that soil or compost material, soybean harvesting equipment, machinery and any other thing suspected of being infested with the pest, including soybean (*Glycine max*) seed for propagation, that is transported from an area of infestation identified pursuant to section 16 of the *Plant Protection Regulations* to any other area of Canada requires a Movement Certificate.

The Canadian Food Inspection Agency (CFIA) has regulated *H. glycines* for more than three decades. The following CFIA Plant Health Directives include requirements that regulate imports to prevent the entry of *H. glycines* into Canada or prevent its spread, through infested soil, within Canada:

- D-94-17: Plant Protection Import Requirements for Soybean Seed.
- D-98-01: Import Requirements for Seed Potatoes and Other Potato Propagative Material.
- D-96-05: Import Requirements of Potatoes, potato parts and potato by-products.
- D-94-26, Plant protection import requirements for edible roots for consumption or processing.
- D-95-26: Phytosanitary requirements for soil and related matter, alone or in association with plants.

5.0 PEST RISK ASSESSMENT SUMMARY (2010)

Heterodera glycines is one of the most destructive pests of soybean. Wrather and co-workers (2001) reported that, both in Canada and the USA, yield losses due to *H. glycines* was higher than that caused by any other pest or pathogen of soybean. Yield losses to this nematode is an ongoing issue in regions where the pest is not effectively managed through the use of crop rotation with non-host crops, and the use of appropriate resistant soybean varieties.

Soil is the only significant pathway for the movement of this pest. The spread of *H. glycines* via soil associated with crops, commodities, seed, horticultural plants, machinery, footwear etc., is primarily human mediated. Cysts can also move via the feet of birds and other wildlife; via water (e.g. flooding) and wind, suggesting that the pest will eventually spread to all soybean production areas in North America.

Since its first detection in Kent County, Ontario in 1987, the pest has been detected in soybean fields of several counties in Ontario including Essex, Elgin, Huron, Haldimand, the Municipality of Chatham-Kent, Lambton, Middlesex, Norfolk, Oxford, and the United Counties of Prescott-Russell, Brant, Regional Municipality of Niagara, Northumberland, the City of Ottawa, the Regional Municipality of Peel, Perth and the United Counties of Stormont, Dundas and Glengarry, and City of Kawartha Lakes. *Heterodera glycines* infested counties account for about 75% of the soybeans produced in Ontario and one half of Canadian soybean production. In 2009, it was detected in a soil sample from the Rural Municipality of South Norfolk in Manitoba.

Domestic movement restrictions of soil from *H. glycines* infested areas are difficult to enforce due to the wide geographic area of the infested counties in Ontario, the lack of knowledge of movement activities and compliance of growers to the movement of regulated articles, which includes equipment and agricultural commodities associated with infested soil. The expanding range of *H. glycines* in Ontario attests to the continuous spread from infested counties to other areas.

Prior to 1972, United States Department of Agriculture (USDA) domestic quarantines for *H. glycines* contained provisions that were equivalent to, if not more stringent than, those contained in current Canadian regulations relating to *H. glycines*. Despite this, the USDA abandoned their federal quarantines in 1972 as they had proven ineffective in limiting the spread of *H. glycines*, due in part to limitations in enforcement, lack of compliance with regulatory requirements, and natural spread of the pest to new areas. It is considered widespread in the soybean production areas of the USA

<http://www.inspection.gc.ca/english/plaveg/protect/dir/d-96-05me.jpg>.

In the absence of U.S. regulation, *H. glycines* will continue to spread, undetected, to new areas of the U.S and repeatedly into Canada via established pathways of introduction. New infestations have almost certainly occurred, but will not be reported until populations build to detectable levels. In North Dakota, it was estimated that *H. glycines* had been present for 5 to 7 years before the symptoms in the field led to detection by soil tests (Bradley et al., 2003).

Given that numerous U.S. states could be infested and remain unregulated, that soil surveys are of limited sensitivity, and that some *H. glycines* positive counties in Ontario are not currently regulated; current Canadian regulations and practices are unable to prevent further spread of this pest. On one hand, the inability to enforce strict domestic soil movement requirements and on the other, the rigorous enforcement of import control on host material is inconsistent with our obligations under the World Trade Organization – Sanitary and Phytosanitary Measures, (WTO-SPS).

6.0 RISK MANAGEMENT CONSIDERATIONS

6.1 Standards of the International Plant Protection Convention (IPPC)

"The International Plant Protection Convention (IPPC) has been designated as the standard-setting authority of the WTO. The IPPC Standard for Phytosanitary Measures (ISPM) No. 19, Guidelines on Lists of Regulated Pests (2003), requires that pests regulated by National Plant Protection Organizations meet the criteria for either quarantine pests or regulated non-quarantine pests.

To be considered a quarantine pest according to the IPPC's definition, an organism must be "a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled". In 2001, the Interim Commission on Phytosanitary Measures approved Guidelines on the Interpretation and Application of the Concept of Official Control for Regulated Pests (see Supplement No. 1 in ISPM No.5). These guidelines include, among other elements, that measures be mandatory and that domestic and import requirements should have the same or equivalent effect.

Thus, for Canada to comply with WTO and IPPC guidelines and continue to regulate *H. glycines* as a quarantine pest on imports, it would have to strengthen the enforcement of domestic movement restriction from any infested area in Ontario and Manitoba.

7.0 PEST RISK MANAGEMENT

7.1 Considerations

7.1.1. Domestic movement regulations

In Ontario, the soybean production area is expanding and the nematode is widespread. The limitation in enforcing domestic regulation, along with lack of movement compliance, may have been a contributing factor to the spread of the pest to new areas in Ontario. The recent detection of *H. glycines* in Manitoba is a good example which reiterates the challenges in enforcing domestic movement regulations over a wider area. The detection was in a field well outside the flood zone of the Red River, and on a site where there was no record of previous soybean production. Thus, the likelihood of the pathway of introduction of *H. glycines* to this site may have been the seed from an infested field or spread of infested soil using agricultural equipment from other fields where soybeans are produced.

7.1.2. Spread by natural pathways

Natural pathways, such as wind, water and birds, also contribute to the spread of the nematode to new areas. These factors and the spread cannot be controlled by regulations and enforcements. The continuous spread of the pest in Ontario, to new production areas, though cryptic, could be attributed to these factors. The Manitoba soybean production area is in the Red River valley, which is contiguous with the production areas of Minnesota and North Dakota, where *H. glycines* has been reported within 300 km of the border. Considering the potential for annual flooding in this area it is very likely that *H. glycines* has spread into the soybean production areas of Manitoba along the Red River. Similarly, *H. glycines* has been reported in eastern Ontario in 2008 and is likely present in the neighbouring soybean production area extending down the St. Lawrence valley.

7.1.3. Soil surveys

In order to effectively regulate *H. glycines* in Canada, additional extensive surveys would need to be conducted to determine the current distribution of the pest in soybean production areas. Soil surveys, which are highly resource-intensive exercises, would never fully describe the true distribution of this pest, given its biology, pathways of spread and wide spread distribution in Ontario. It is reported that the population of the pest needs to build to a detectable level to be confirmed by soil surveys.

7.1.4. Enforcement requirements on infested fields

To maintain the regulated status of *H. glycines*, containment measures would then have to be implemented by the CFIA that would parallel the current measures in place to contain the two species of potato cyst nematode that are present in Canada, *Globodera pallida* and *G. rostochiensis*, as per the Golden Nematode Order, SOR/80-260 (Saanich, British Columbia) and Golden Nematode Infested Places Order (Quebec).

Quarantine measures would include: 1) Immediate issuance of notice of quarantine or equivalent regulatory order; 2) Categorization of lands in the infested zone, as infested, exposed and adjacent. All these categorized lands will be placed under quarantine; 3) Restriction on the production of all host and minor hosts of *H. glycines*; 4) Prohibition on movement of soil and equipment associated with infested soil; 5) Prohibition on movement of plant and plant parts with infested soil; 6) Restriction on the movement of equipment and plant material from other category fields in the quarantine area; 7) Restriction on movement of grains intended for other end uses; and 8) Establishment of various compliance agreements for facilities handling regulated plant and plant parts originating from regulated areas.

It would be very costly to implement a similarly rigorous regulatory program and it would severely impact most soybean seed growers and those agricultural sectors, such as equipment operators in Ontario that move soil, either intentionally or unintentionally.

7.2 Proposed Approach

The CFIA considered the different risk management options presented in Appendix A.

After due consideration of the advantages and disadvantages of each option, the CFIA is proposing the de-regulation of *H. glycines* all across Canada.

7.2.1 Impact on exports and imports

The proposed de-regulation of *H. glycines* in Canada will not have any market access impacts based on the current requirements of trading partners. Because of the uncertainty in the current distribution of *H. glycines* in Canada and various challenges in enforcing domestic movement regulations from the known infested areas in Canada, the removal of regulations should not impact the *status quo*.

Freedom from soil in exports of seed and grain from Canada addresses the phytosanitary concerns of trading partners for this pest. The costs of implementing stricter quarantine measures, combined with the lack of control over natural spread of *H. glycines*, make an investment in strengthening a regulatory program questionable in terms of benefit to stakeholders, particularly when market access for soybeans is not an issue and the pest is managed by growers through current crop management practices.

If deregulated, would allow Canada to lift restrictions on the import of soybean seed, as well as potatoes (seed, table and processing) from some US states, which are currently regulated for the presence of soybean cyst nematode.

8.0 RISK MANAGEMENT DECISION

8.1 Decision

The CFIA will make a decision after reviewing the feedback received from consultation with its federal, provincial and territorial partners, affected Canadian stakeholders, the scientific community and the general public.

8.2 Next Steps

Depending on the outcome of stakeholder consultations, the implementation of the de-regulation of *H. glycines* would require the following steps:

- Removal of *H. glycines* from “*List of Pests Regulated by Canada*”;
- Initiate the regulatory process to remove *H. glycines* from the Schedule II of the *Plant Protection Regulations*;
- WTO notification;
- Canada Border Services Agency (CBSA) notification;
- Amendments to the existing Plant Health Biosecurity Directorate directives:
 - The CFIA directive D-94-17 will be revoked.
 - The CFIA directives D-95-26, D-98-01, D-96-05, D-94-25, D-94-26 and D-94-34 will be amended to remove reference to requirements for freedom from *H. glycines*;
- The Automated Import Reference Systems (AIRS) will also be updated to reflect that the importation of soybean seed, potatoes, ginseng, and vegetables are no longer subject to *H. glycines* import requirements.
- Add a statement in the Risk Management Decision Document to indicate the CFIA’s decision on de-regulation of *H. glycines*
 - "As of “Date, Year” the CFIA will not enforce Schedule II of the *Plant Protection Regulations* as it pertains to the import, export and domestic movement of *H. glycines*."
- Post the Risk Management Decision Document on the CFIA website.

9.0 REFERENCES

Bradley, C, Nelson, B, Helms, T. 2003. Soybean cyst nematode reported in North Dakota. North Dakota State University. August 28, 2003.

Canadian Food Inspection Agency (CFIA). 2006. Directive 94-17: Plant Protection Import Requirements for soybean seed. CFIA, Ottawa, ON.

Canadian Food Inspection Agency (CFIA). 2008. Directive 95-26: Phytosanitary requirements for soil and related matter, alone or in association with plants. CFIA, Ottawa, ON.

Canadian Food Inspection Agency (CFIA). 2009. Directive 98-01: Import Requirements for seed potatoes and other potato propagative material. CFIA, Ottawa, ON.

Canadian Food Inspection Agency (CFIA). 2010. Directive 94-26: Plant protection import requirements for edible roots for consumption or processing. CFIA, Ottawa, ON.

Canadian Food Inspection Agency (CFIA). 2010. Directive 96-05: Import Requirements for Potatoes, potato parts and potato by-products. CFIA, Ottawa, ON.

Golden Nematode Infested Places Order

Golden Nematode Order 2010 (SOR/80-260)

International Plant Protection Convention (IPPC). 2001. Report of the Third Interim Commission on Phytosanitary Measures. 2001. Secretariat of the International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, Italy.

International Plant Protection Convention (IPPC). 2006. International Standards for Phytosanitary Measures 1 to 27 (2006 edition). Secretariat of the International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, Italy.

International Plant Protection Convention (IPPC). (updated annually). ISPM No. 5 Glossary of Phytosanitary Terms. Secretariat of the International Plant Protection Convention, Food and Agriculture Organization of the United Nations, Rome, Italy.

Plant Protection Regulations (SOR/95-212)

Pest Risk Assessment. 2010. Evaluation of import pathways for the soybean cyst nematode. Plant Health Risk Assessment Unit, CFIA, Ottawa, ON.

World Trade Organization (WTO). 1995. Agreement on the Application of Sanitary and Phytosanitary Measures. http://www.wto.org/english/docs_e/legal_e/15-sps.pdf

Wrather, J.A., Stienstra, W.C. and Koenning, S.R. 2001. Soybean disease loss estimates for the top ten soybean-producing countries in 1998. Canadian Journal of Plant Pathology 23 (2): 122-131.

APPENDIX A - PEST RISK MANAGEMENT OPTIONS CONSIDERED

	Options	Advantages	Disadvantages
1	<p><i>Status quo: Regulated Pest</i> <i>Status of Heterodera glycines</i></p> <p>Retain <i>H. glycines</i> in the “<i>List of Regulated Pests of Canada</i>”</p> <p>AND</p> <p><i>Schedule II of Plant Protection Regulation on Restricted Movement Within Canada</i></p> <p>AND</p> <p>Implement official control measures if found in a new area</p>	<p>Control over import of seeds, potatoes and associated soil</p> <p>Control over Domestic Movement of seed, and soil associated with seed, potato tubers, horticultural root crops, plant material, farm machinery and equipment etc.</p> <p>Authority to respond to positive finds and implementing official control measures</p> <p>Authority to contain the pest by enforcing mitigation measures at point of origin, if from an infested area</p>	<p>Already present in large areas and numerous soybean production counties of Ontario.</p> <p>No control over natural pathways of pest introduction, such as: Wind Floods Birds etc.</p> <p>More resources needed to enforce domestic movement restrictions</p> <p>Potential additional costs to the growers to follow quarantine measures</p> <p>Additional costs in establishing and maintaining compliance agreements to handle regulated plant and plant parts from regulated areas</p> <p>Potential additional costs to equipment operators (e.g. cleaning costs)</p> <p>Potential for negative impact on trading partners and trading relationships due to continued oversight of imported commodities</p>

		<p>Potential for WTO challenges from trading partners over discrepancy in domestic and import regulations, if domestic regulations are not enforced</p>
<p>2 Declare Ontario as “infested area” and continue regulation of <i>H. glycines</i> in rest of Canada</p> <p>Retain <i>H. glycines</i> in the “<i>List of Regulated Pests of Canada</i>”</p> <p>AND</p> <p><i>Schedule II of Plant Protection Regulation on Restricted Movement Within Canada</i></p> <p>AND</p> <p>Make changes to <i>Schedule II of Plant Protection Regulation on Restricted Movement from Ontario to the rest of Canada</i></p> <p>AND</p> <p>Implement official control measures if found in a new area</p>	<p>Authority to respond to positive finds at a location outside Ontario and implement official quarantine measures</p> <p>Quarantine measures would include:</p> <ol style="list-style-type: none"> 1. Declaring Ontario as a “soybean cyst nematode-infested area” 2. Immediate issuance of notice of quarantine or equivalent regulatory order 3. Categorization of lands in the infested zone, as infested, exposed and adjacent. All these categorized lands will be under quarantine 4. Restriction on production of all host and minor hosts of <i>H. glycines</i> 	<p>Domestic movement restrictions apply from Ontario to rest of Canada</p> <p>No control over natural pathways of pest introduction, such as: Wind Floods Birds etc.</p> <p>Potential impact on trade from Ontario</p> <p>More resources, potential partnerships with provinces and service providers needed to:</p> <ol style="list-style-type: none"> a. Apply potential quarantine measures. b. Enforce domestic movement restrictions. c. To conduct extensive annual surveys <p>Potential additional costs to the grower/regulator field owner when quarantine measures implemented: restriction on sale and movement of equipment, cleaning costs etc.</p>

		<p>5. Restriction on movement of soil and equipment associated with infested soil</p> <p>6. Restriction on movement of plant and plant parts with infested soil</p> <p>7. Restriction on the movement of equipment and plant material from other category fields in the quarantine area</p> <p>8. Restriction on movement of grains intended for other end uses</p> <p>Control over import of seeds, potatoes, horticultural root crops and associated soil into Canada except Ontario</p> <p>Requirement on procurement of seed and seed potatoes intended for planting outside Ontario, from a field or area free of <i>H. glycines</i></p> <p>Control over Domestic Movement of seed, and soil associated with seed, potato tubers, horticultural root crops, plant material, farm machinery and equipment etc., from Ontario to the rest of Canada</p> <p>Better prepared through official surveys, in soybean production areas outside Ontario</p>	<p>Potential impact on soybean and potato seed producers in Ontario</p> <p>Additional costs in establishing and maintaining compliance agreements to handle regulated plant and plant parts from regulated areas</p> <p>Potential additional costs to Ontario equipment operators, like cleaning costs</p> <p>Potential for negative impact on trading partners and trading relationships due to more stringent oversight of imported commodities.</p> <p>Potential for WTO challenges from trading partners over discrepancy in domestic and import regulations, if domestic regulations are not enforced.</p>
--	--	---	---

<p>3 De-regulate <i>H. glycines</i> across Canada</p> <p>Remove <i>H. glycines</i> from the “<i>List of Pests Regulated by Canada</i>”</p> <p>AND</p> <p>Remove <i>H. glycines</i> from <i>Schedule II of the Plant Protection Regulation on Domestic Movement Within Canada</i></p>	<p>Meet international obligations to IPPC, WTO-SPS, by adopting a harmonized approach to imports and domestic policies.</p> <p>No additional resources and costs for enforcement of regulations pertaining to <i>H. glycines</i></p> <p>No additional requirements and costs, related to <i>H. glycines</i> certification, for exporters to Canada</p> <p>No domestic movement restrictions for commodities and equipment associated with <i>H. glycines</i></p> <p>Unrestricted movement between <i>H. glycines</i> infested counties/provinces, states in the USA and the rest of Canada</p> <p>Soil – The most significant pathway for movement of <i>H. glycines</i> is regulated in imports.</p>	<p>No authority to regulated <i>H. glycines</i> on imports.</p>
---	---	---