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DRAFT IMPORT RISK ANALYSIS OF THE IMPORTATION OF SWEETCORN (*ZEA MAYS* L.) SEED FROM IDAHO (UNITED STATES OF AMERICA) FOR THE PURPOSE OF FIELD SOWING IN AUSTRALIA

JANUARY 2000

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EXECUTIVE SUMMARY

AQIS has received several requests to facilitate imports of sweetcorn seed from Idaho by removing the current post-entry quarantine requirements. These requests range from imports of sample quantities of seed for breeding purposes to imports of unrestricted quantities of seed for the production of new varieties of super sweet cobs for domestic consumption and export. AQIS has also received a proposal for the importation of bulk maize grain from the USA.

AQIS has commenced a routine Import Risk Analysis (IRA) of the proposed sweetcorn seed imports from Idaho. This draft IRA paper presents a pest risk assessment and a range of options for managing potential risks of pests of quarantine concern to Australia. AQIS is conducting a separate non-routine IRA of the USA bulk maize grain imports.

The IRA has identified nine arthropods, one fungus, three viruses, and 25 weed species of quarantine concern to Australia with imports of sweetcorn seed from Idaho. A range of pest risk management options is proposed in this paper to provide an appropriate level of protection by mitigating the potential risk of introduction to Australia of the quarantine pests. Inspection and, if necessary, fumigation are proposed as acceptable risk management options to address the risk of quarantine arthropod pests. Seed cleaning is proposed as an effective option for the removal of weed seeds and other extraneous matter from the sweetcorn seed. Seed treatment with appropriate fungicides is proposed as an acceptable option to address the risk of the boil smut fungus, *Ustilago zeae*. Pest free area status of export fields, verified by inspection and testing, is proposed as an acceptable option to address the risk of High Plains *tenuivirus*, maize dwarf mosaic *potyvirus* and wheat streak mosaic *rymovirus*.

While there are many management options available for addressing the pest risks associated with Idaho-grown sweetcorn seed, most of these options would not be practical for addressing quarantine risks associated with imports of unprocessed bulk maize grain from the United States.

In accordance with *The AQIS Import Risk Analysis Process Handbook* (AQIS, 1998), this draft IRA paper is circulated to stakeholders for comment.

1. INTRODUCTION

In accordance with the *International Standards for Phytosanitary Measures – Principles of Plant Quarantine as Related to International Trade, ISPM No. 1* (FAO, 1995); *International Standards for Phytosanitary Measures – Guidelines for Pest Risk Analysis, ISPM No. 2* (FAO, 1996a); and other standards being developed by the Secretariat of the International Plant Protection Convention (IPPC) of the Food and Agriculture Organization of the United Nations (FAO), for any application to import a new commodity from a new source, the Australian Quarantine and Inspection Service (AQIS) conducts an import risk analysis (IRA)[1] on the phytosanitary risk to Australia from a proposed importation.

The primary purpose of an IRA is to identify regulated pests (quarantine pests[2] and regulated non-quarantine pests[3]) potentially associated with the commodity, to analyse their risk of introduction, establishment, spread and potential economic importance in Australia; and to evaluate candidate management options to mitigate such risks. Having identified the quarantine pests associated with the importation, AQIS will consider whether management options are available to mitigate the risks of entry by those pests and of their subsequent establishment and spread. A draft IRA, based on the best available scientific evidence, is documented for consultation with interested parties and to ensure that the decision-making process is transparent and technically justifiable.

This draft IRA outlines the risk analysis of the proposed importation of sweetcorn (*Zea mays* L.) seed for field sowing from the State of Idaho (hereafter referred to as Idaho) in the United States of America (hereafter referred to as the United States). The IRA paper includes specific details of pests associated with sweetcorn seed from Idaho. For the purpose of the document the term "pest" is 'any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products' as defined by FAO (1997b).

[1] In this document the term import risk analysis is synonymous with the term pest risk analysis as defined in the FAO Glossary of Phytosanitary Terms (FAO, 1997b).
[2] FAO definition of a quarantine pest (FAO, 1997b): 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.
[3] FAO definition of a regulated non-quarantine pest (FAO, 1997a): A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party.

This IRA is being conducted using the routine IRA process outlined in *The AQIS Import Risk Analysis Process Handbook* (AQIS, 1998). In accordance with the routine IRA process, this draft IRA paper is circulated to stakeholders for comment. After consideration of all technical issues and comments, AQIS will finalise its recommendations.

2. PURPOSE

This draft IRA paper presents a pest risk assessment and management options for pests of quarantine concern to Australia with proposed sweetcorn seed imports from Idaho, and provides a framework to consult with stakeholders on the IRA.

3. BACKGROUND

3.1 Australia's Sweetcorn Seed Import Policy

Australia's current legislation prohibits the importation of sweetcorn seed except where AQIS issues import permits that specify phytosanitary measures to manage quarantine risks (Quarantine Proclamation 1998 made under the *Quarantine Act 1908*).

3.1.1 Open quarantine

Prior to 1990, imports of restricted quantities of seed of sweetcorn inbred lines were permitted from the United States and other countries for growing at an AQIS-approved quarantine field, i.e., open quarantine, (AQIS, 1990). The seed from plants grown in open quarantine was released to the importer, providing no quarantine pests were detected during two visual inspections of the plants. The open quarantine option was suspended in 1990 following concerns regarding the potential risk of establishment and spread of downy mildews and Stewart's bacterial wilt.

3.1.2 Post-entry quarantine

Current conditions for the importation of sweetcorn seed for sowing to Australia from the United States and other countries, with the exception of New Zealand, include the requirement to grow imported seed in an AQIS-approved quarantine glasshouse, i.e., post-entry quarantine (PEQ). Generally, sample quantities of sweetcorn seed, sufficient to establish a line, are grown in PEQ due to space limitations in quarantine glasshouses.

Plants are inspected for the presence of quarantine pests. If no quarantine pests are found, the seed from these plants is released from quarantine.

3.1.3 Free entry

Australian sweetcorn producers can currently import unrestricted quantities of sweetcorn seed from New Zealand subject to on-arrival inspection, without the post-entry or open quarantine requirements, as quarantine seed-borne diseases of sweetcorn are not known to occur in New Zealand. The imported seed is planted in the field for various purposes, including multiplication of inbred parent lines, production of hybrid seed and cultivation of sweetcorn for the production of fresh cobs for consumption. Australian importers can access seed of new varieties of sweetcorn from the United States and other countries through New Zealand. Bulk sweetcorn seed, which meets the New Zealand quarantine requirements, can be imported into New Zealand and grown for one generation in the field, and the progeny may be exported to Australia.

3.2 History of Import Proposals

AQIS has received several requests to facilitate the importation of sweetcorn seed from Idaho. The requests range from imports of seed for breeding purposes to imports of seed for the production of new varieties of super sweet cobs for domestic consumption and export.

In 1993, AQIS commenced a risk analysis of proposals to import sweetcorn seed from Idaho, and requested information from the Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture (USDA) regarding the pests of sweetcorn present in Idaho. However, AQIS did not pursue the issue further at that time due to uncertainty over the potential risk of High Plains *tenuivirus* (HPV) in the United States.

Following clarification of the significance of HPV, AQIS recommenced consideration of the proposals for the importation of sweetcorn seed for sowing from Idaho, using the IRA process as described in *The AQIS Import Risk Analysis Process Handbook* (AQIS, 1998). On 9 September 1998, AQIS informed stakeholders of its intention to undertake the IRA. On 20 October 1998, stakeholders were advised of the proposed timeframe for

the IRA, and invited to comment on the proposal to conduct the IRA using the routine process. Stakeholders were informed on 8 February 1999 of AQIS's decision to proceed with the IRA using the routine process.

In 1998/99, AQIS collected a great deal of information on sweetcorn pests for an IRA of bulk maize (*Zea mays*) grain imports from the United States (AQIS, 1999). The relevant information from that work has been considered in this IRA paper. AQIS notes that pest risks associated with Idaho sweetcorn seed are much lower than those for bulk maize grain imports from the United States given the relatively pest-free status of Idaho and feasibility of a much wider range of pest risk management measures for sweetcorn seed as compared with bulk maize grain.

3.3 The Sweetcorn Industry in Australia

In Australia, approximately 50 000 ha is cultivated for commercial sweetcorn production for the fresh, frozen and canned food industries. The primary production areas are in Queensland, Western Australia and Victoria. In 1996, the Australian sweetcorn market was valued at $30.6 million at the farm gate, and $145 million overall. Australia imports approximately 28 000 tonnes of mainly frozen sweetcorn, and exports approximately 6 000 tonnes of fresh and canned sweetcorn. Summary sweetcorn production statistics are given in Table 1.

Approximately 75 to 80 tonnes of sweetcorn seed is produced per annum, and 60 percent of the seed is exported (Table 1), mainly to Asia, China, Europe and South America.

Table 1 Australian sweetcorn industry statistics

Year	Sweetcorn Cob Production[1] (tonnes)	Sweetcorn Seed[2]	
		Production (tonnes)	Exports (tonnes)
1994/95	72 686	75	55
1995/96	74 055	75	53
1996/97	81 091	75	50
1997/98	64 785	80	50

1: Australian Bureau of Statistics; 2: Seed Industry Association of Australia.

Maize grain is an important cereal crop in Australia, ranking seventh in area sown after wheat, barley, oats, sorghum, rice and triticale. Production area, yield and production tonnages are shown in Table 2. In Australia, most of the maize grain is produced in New South Wales and Queensland, and small quantities are produced in Western Australia and Victoria (Australian Bureau of Agricultural and Resource Economics, 1998).

Table 2 Australian maize grain production statistics[1]

Year	Area (000 ha)	Yield (t/ha)	Production (kt)
1994/95	50	4.83	242
1995/96	63	5.03	317
1996/97	68	5.46	371
1997/98	63	5.42	340

1: Australian Commodity Statistics. Australian Bureau of Agricultural and Resource Economic (ABARE), 1998, Canberra. 346pp

3.4 The Sweetcorn Industry in Idaho

Idaho is one of the largest producers of sweetcorn seed in the United States, and 83 percent of sweetcorn seed produced in Idaho is exported. During the period 1994 to 1998, Idaho exported 10 577 tonnes of sweetcorn seed. Export destinations include; Argentina, Canada, France, Israel, Japan, Mexico, the Netherlands, New Zealand, South Africa, Taiwan and the United Kingdom. Idaho also produces sweetcorn for processing and maize for grain and silage. In 1997, Idaho produced 138 618 tonnes of sweetcorn for processing, 157 628 tonnes (6 200 000 bushels) of maize grain, and 1 768 680 tonnes of maize silage.

Idaho is ideal for high health sweetcorn seed production as the arid conditions prevent the development of many of the sweetcorn pests found in other parts of the United States. Weather conditions during the sweetcorn seed production period are dry, with low relative humidity and low rainfall. To maintain dry production conditions, overhead irrigation is not used for sweetcorn crops.

In Idaho, sweetcorn seed crops are generally grown under contract for seed companies. The grower is required to implement the pest management and agronomic practices specified by the contracting seed company. Cobs are picked well above ground level

with special harvesters, and this virtually eliminates contamination of sweetcorn seed with weed seeds. The cobs are transported to packing houses, sorted to remove poor grade cobs, and threshed. The resultant seed is dried, cleaned and sorted to remove poor quality seed and extraneous matter. The seed is generally treated with a fungicide(s). The seed is stored under arthropod pest free conditions and pest control measures are implemented to prevent infestation with storage pests.

Idaho-grown sweetcorn seed is highly regarded for its high health status and is much sought after by sweetcorn growers worldwide.

Many pests of quarantine concern to Australia with imports of sweetcorn seed globally have not been recorded in Idaho, e.g., *Peronosclerospora sorghi, Sclerophthora rayssiae* var. *zeae, Peronosclerospora maydis, Peronosclerospora philippinensis, Peronosclerospora sacchari, Clavibacter michiganensis* subsp. *nebraskensis, Pantoea stewartii* subsp. *stewartii,* Maize chlorotic mottle *machlomovirus, Prostephanus truncatus, Trogoderma granarium* and *Striga* species.

3.5 Bulk Maize Grain Imports from the United States

AQIS is conducting a non-routine IRA of proposed imports of bulk maize grain from the United States for processing and use as animal feed, in accordance with *"The AQIS Import Risk Analysis Handbook"* (AQIS, 1998). In March 1999 AQIS released the draft IRA paper (AQIS, 1999) for stakeholder's comment. The draft IRA identified 111 quarantine pests (AQIS, 1999). AQIS's preliminary view was that any treatment, which would effectively devitalise maize and destroy pests, could achieve Australia's appropriate level of protection. It was considered that the only acceptable management option at that time was pre-export steam heat treatment, in conjunction with measures to maintain pest-free status of the treated grain.

4. BIOLOGICAL ASSESSMENT OF POTENTIAL QUARANTINE PESTS OF CONCERN TO AUSTRALIA

Biological assessments of pests associated with maize from the United States were undertaken by the Risk Analysis Panel (RAP) for the IRA of the importation of bulk maize grain from the United States (AQIS, 1999), with assistance from Technical Working Groups (TWGs) on pathogens, arthropod pests and weeds. The following is a brief summary of the findings of the TWGs and the RAP on the assessment of pests associated with bulk maize grain:

- The TWG on pathogens of maize identified 402 pests of maize from the United States. Of these, 16 were assessed to be quarantine pests.

- The TWG on arthropod pests of maize identified 114 pests associated with maize from the United States. Of these, 17 were assessed to be quarantine pests.

- The TWG on weeds identified 136 weeds associated with maize from the United States. Of these, 78 were assessed to be quarantine pests.

Detailed analysis was undertaken on the potential quarantine pests that may be associated with the pathway (Idaho-grown sweetcorn seed) following the FAO guidelines (FAO 1996a), and using information from the Idaho State Department of Agriculture (ISDA) and other technical experts, available databases, and published scientific literature. The analysis took into account; host range, distribution, biology, life history, entry potential, establishment potential, spread potential and economic damage potential of the pests that may be associated with sweetcorn seeds from Idaho.
Pests were categorised as quarantine or non-quarantine pests as defined in the FAO glossary of phytosanitary terms (FAO 1997b):

Quarantine pest: 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.

Non-quarantine pests: A pest that is not a quarantine pest for an area.

Idaho-grown sweetcorn seed presents a particularly low risk due to the low prevalence of pests and diseases in Idaho as compared with the major, maize grain production areas of the United States. The risk assessment has clearly shown that imports of high health status Idaho-grown sweetcorn seed present a far lower risk than imports of bulk maize grain from the United States.

Table 3 summarises the quarantine status of pests that may be associated with the pathway, high health sweetcorn seed grown in Idaho (Idaho-grown sweetcorn seed). The final column of Table 3 identifies the need for managing the potential risks of these quarantine pests.

Data sheets for the quarantine pests likely to be on the pathway are provided in Annexure 1. Summary data sheets for the pests that are considered non-quarantine pests or quarantine pests not on the pathway are provided in Annexure 2.

Table 3 Quarantine status of pests associated with sweetcorn seed from Idaho

Pest	Common Name	*Distribution*		Australian Quarantine Status	Present on Pathway[1] (seeds)	Economic Impact	Quarantine Management Required
		Idaho	Australia				
ARTHROPODS							
Aceria tosichella (Keifer)	wheat curl mite	Yes	Yes	Non-quarantine			
Bruchus pisorum (Linnaeus)	pea weevil	Yes	Yes	Non-quarantine			
Cryptolestes turcicus (Grouvelle)	flat grain beetle	Yes	No	Quarantine	Yes[2]	High	Yes
Cynaeus angustus (LeConte)	large black flour beetle	Yes	No	Quarantine	Yes[2]	High	Yes
Delia platura (Meigen)	seed corn maggot	Yes	Yes	Non-quarantine			
Diabrotica undecimpunctata Mannerhein	southern corn rootworm	Yes	No	Quarantine	No		
Diabrotica virgifera LeConte	western corn rootworm	Yes	No	Quarantine	No		
Dinoderus minutus (Linnaeus)	bamboo powderpost beetle	Yes	Yes	Non-quarantine			
Ephestia kuehniella (Zeller)	Mediterranean flour beetle	Yes	Yes	Non-quarantine			

Pest	Common Name	*Distribution*		Australian Quarantine Status	Present on Pathway[1] (seeds)	Economic Impact	Quarantine Management Required
		Idaho	Australia				
Glischrochilus quadrisignatus (Say)	four spotted sap beetle	Yes	No	Quarantine	Yes[2]	High	Yes
Lema melanopa Linnaeus	cereal beetle	Yes	No	Quarantine	No		
Plodia interpunctella (Hebner)	Indian meal moth	Yes	Yes	Non-quarantine			
Rhopalosiphum maidis (Fitch)	corn leaf aphid	Yes	Yes	Non-quarantine			
Rhopalosiphum padi (Linnaeus)	bird cherry-oat aphid	Yes	Yes	Non-quarantine			
Tribolium audax Halstead	American black flour beetle	Yes	No	Quarantine	Yes[2]	Medium	Yes
Tribolium brevicornis (LeConte)	flour beetle	Yes	No	Quarantine	Yes[2]	Low	
Trogoderma glabrum (Herbst)	glabrous cabinet beetle	Yes	No	Quarantine	Yes[2]	Low	
Trogoderma inclusum LeConte	large cabinet beetle	Yes	No	Quarantine	Yes[2]	High	Yes
Trogoderma ornatum (Say)	ornate cabinet beetle	Yes	No	Quarantine	Yes[2]	Low	
Trogoderma variabile Ballion	warehouse beetle	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
FUNGI							
Alternaria alternata (Fr.:Fr.) Keissl.	Alternaria leaf blight	Yes	Yes	Non-Quarantine			
Cladosporium cladosporioides (Fresen) DeVries	Cladosporium rot	Yes	Yes	Non-Quarantine			
Curvularia pallescens Boedijn	Curvularia leaf spot	Yes	Yes	Non-Quarantine			
Diplodia maydis (Berk.) Sacc.	ear rot	Yes	Yes	Non-Quarantine			
Fusarium moniliforme Sheld.	Fusarium ear rot	Yes	Yes	Non-Quarantine			
Gibberella zeae (Schwei.) Petch	Fusarium stalk rot	Yes	Yes	Non-Quarantine			
Nigrospora oryzae (Berk. & Broome) Petch.	Nigrospora ear rot	Yes	Yes	Non-Quarantine			
Penicillium oxalicum Currie & Thom	Penicillium rot	Yes	Yes	Non-Quarantine			
Pythium ultimum Trow	root rot	Yes	Yes	Non-Quarantine			
Rhizopus arrhizus A. Fischer	Rhizopus ear rot	Yes	Yes	Non-Quarantine			
Sporisorium holci-sorghi (Rivolta) Vanky	head smut	Yes	Yes	Non-Quarantine			
Ustilago zeae (Beckm.) Unger	boil smut, common smut	Yes	Yes[3]	Quarantine	Yes	Medium	Yes

Pest	Common Name	*Distribution*		Australian Quarantine Status	Present on Pathway[1] (seeds)	Economic Impact	Quarantine Management Required
VIRUSES							
High Plains *tenuivirus*	High Plains disorder	Yes	No[4]	Quarantine	Yes	High	Yes
Maize dwarf mosaic *potyvirus*	maize dwarf mosaic	Yes	No	Quarantine	Yes	High	Yes
Wheat streak mosaic *rymovirus*	wheat streak mosaic	Yes	No[4]	Quarantine	Yes	High	Yes
WEEDS							
Agropyron repens (L.) Beauv.	quackgrass	Yes	Yes	Non-quarantine			
Amaranthus albus L.	tumble pigweed	Yes	Yes	Non-quarantine			
Amaranthus hybridus L.	smooth pigweed	Yes	Yes	Non-quarantine			
Ambrosia artemisiifolia L.	common ragweed	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Ambrosia trifida L.	giant ragweed	Yes	No	Quarantine	Yes[2]	Medium	Yes
Ampelamus albidus (Nutt) Britt.	honeyvine milkweed	Yes	No	Quarantine	Yes[2]	Medium	Yes
Apocynum cannabinum L.	hemp dogbane	Yes	No	Quarantine	Yes[2]	Medium	Yes
Artemisia annua L.	wormwood	Yes	Yes	Non-quarantine			
Avena fatua L.	wild oat	Yes	Yes	Non-quarantine			
Barbarea vulgaris R. Br.	wintercress	Yes	Yes	Non-quarantine			
Berteroa incana (L.) DC.	hoary Alison	Yes	No	Quarantine	Yes[2]	Medium	Yes
Brassica kaper (DC.) L.C. Wheeler	charlock	Yes	Yes	Non-quarantine			
Brassica nigra (L.) Koch.	black mustard	Yes	Yes	Non-quarantine			
Bromus tectorum L.	downy brome	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Calystegia sepium (L.) R.Br.	hedge bindweed	Yes	Yes	Non-quarantine			
Cenchrus longispinus (Hack.) Fern.	longspine sandbur	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Chenopodium album L.	common lambsquaters	Yes	Yes	Non-quarantine			
Cirsium arvense (L.) Scop.	Canada thistle	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Conringia orientalis (L.) Dumort.	hare's ear	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Convolvulus arvensis L.	field bindweed	Yes	Yes	Quarantine	Yes[2]	High	Yes
Conyza canadensis (L.) Cronq.	horseweed	Yes	Yes	Non-quarantine			
Cynodon dactylon (L.C. Rich) Pers.	Bermuda grass	Yes	Yes	Non-quarantine			
Datura inoxia Miller	downy thornapple	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Datura stramonium L.	jimsonweed	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Daucus carota L.	wild carrot	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Digitaria ischaemum (Schreb.) Schreb.	smooth summer grass	Yes	Yes	Non-quarantine			
Digitaria sanquinalis (L.) Scop.	crabgrass	Yes	Yes	Non-quarantine			
Echinochloa crus-galli (L.) Beauv.	barnyard grass	Yes	Yes	Non-quarantine			
Equisetum arvense L.	common horsetail	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Eragrostis cilianensis (All.) Link ex Lutati	stink lovegrass	Yes	Yes	Non-quarantine			
Euphorbia supina Raf. ex Boiss	prostrate spurge	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Hibiscus trionum L.	bladder hibiscus	Yes	Yes	Non-quarantine			
Kochia scoparia (L.) Schrad.	kochia	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Lamium amplexicaule L.	henbit	Yes	Yes	Non-			

Pest	Common Name	*Distribution*		Australian Quarantine Status	Present on Pathway[1] (seeds)	Economic Impact	Quarantine Management Required
				quarantine			
Lolium multiflorum Lam. (resistant to imidazolinone)	Italian ryegrass	Yes	No	Quarantine	Yes[2]	High	Yes
Lychnis alba Mill.	white cockle	Yes	Yes	Non-quarantine			
Malva neglecta Wallr.	common mallow	Yes	Yes	Non-quarantine			
Mollugo verticillata Roxb.	carpetweed	Yes	Yes	Non-quarantine			
Panicum dichotomiflorum Michx.	fall panicgrass	Yes	No	Quarantine	Yes[2]	High	Yes
Panicum miliaceum L.	wild proso millet	Yes	Yes	Non-quarantine			
Poa pratensis L.	Kentucky bluerass	Yes	Yes	Non-quarantine			
Polygonum convolvulus L.	knotweed	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Polygonum lapathifolium L.	knotweed	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Portulaca oleracea L.	pigweed	Yes	Yes	Non-quarantine			
Rottboellia exaltata L.	itchgrass	Yes	Yes	Non-quarantine			
Rumex crispus L.	curled dock	Yes	Yes	Non-quarantine			
Salsola iberica Sennen & Pau	thistle	Yes	No	Quarantine	Yes[2]	Medium	Yes
Senecio vulgaris L.	common groundsel	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Setaria glauca (L.) Beauv.	yellow foxtail	Yes	Yes	Non-quarantine			
Setaria verticillata (L.) Beauv.	foxtail	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Setaria viridis (L.)	foxtail	Yes	Yes	Non-quarantine			
Solanum sarachoides Sendt.	nightshade	Yes	Yes	Non-quarantine			
Sorghum halepense (L.) Pers.	Johnson grass	Yes	Yes[3]	Quarantine	Yes[2]	High	Yes
Stellaria media (L.) Cyr.	common chickweed	Yes	Yes	Non-quarantine			
Taraxacum officinale Wiggers	dandelion	Yes	Yes	Non-quarantine			
Xanthium spinosum L.	common cockleburr	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes
Xanthium strumarium L. (resistant to imidazolinone)	Noogoora burr	Yes	No	Quarantine	Yes[2]	Medium	Yes
Xanthium strumarium L.	Noogoora burr	Yes	Yes[3]	Quarantine	Yes[2]	Medium	Yes

FAO definition of pathway (FAO, 1997b): Any means that allows the entry or spread of a pest. In this case the pathway is Idaho-grown sweetcorn seed.

2 Seed production, processing and storage methods in Idaho will ensure that export seed is free from this pest, and APHIS would certify freedom from arthropod pests and weed seeds.

3 Under official control in Australia.

4 Unconfirmed records exist of this pest in Australia.

5. QUARANTINE PESTS OF CONCERN TO AUSTRALIA

Based on biological risk assessment of potential quarantine pests (Section 4), AQIS has identified nine arthropods, one fungus, three viruses, and 25 weed species of quarantine concern to Australia with imports of sweetcorn seed from Idaho (Table 4).

Table 4 Quarantine pests associated with Idaho sweetcorn seed

Quarantine Pest	Common Name
ARTHROPODS	
Cryptolestes turcicus (Grouvelle)	flat grain beetle
Cynaeus angustus (LeConte)	large black flour beetle
Glischrochilus quadrisignatus Say	four spotted sap beetle
Tribolium audax Halstead	American black flour beetle
Tribolium brevicornis (LeConte)	flour beetle
Trogoderma glabrum (Herbst)	glabrous cabinet beetle
Trogoderma inclusum LeConte	large cabinet beetle
Trogoderma ornatum Say	ornate cabinet beetle
Trogoderma variabile Ballion	warehouse beetle
FUNGUS	
Ustilago zeae (Beckm.) Unger	boil smut, common smut
VIRUSES	
High Plains *tenuivirus*	High Plains disorder
Maize dwarf mosaic *potyvirus*	maize dwarf mosaic
Wheat streak mosaic *rymovirus*	wheat streak mosaic
WEEDS	
Ambrosia artemisiifolia L.	common ragweed
Ambrosia trifida L.	giant ragweed
Ampelamus albidus (Nutt.) Britt.	honeyvine milkweed
Apocynum cannabinum L.	hemp dogbane
Berteroa incana (L.) DC.	hoary Alison
Bromus tectorum L.	downy brome
Cenchrus longispinus (Hack.) Fern.	longspine sandbur
Cirsium arvense (L.) Scop.	Canada thistle
Conringia orientalis (L.) Dumort.	hare's ear
Datura inoxia Miller	downy thornapple
Datura stramonium L.	jimsonweed
Daucus carota L.	wild carrot
Equisetum arvense L.	common horsetail
Euphorbia supina Raf. ex Boiss	prostrate spurge
Kochia scoparia (L.) Schrad.	kochia
Lolium multiflorum Lam. (herbicide resistant)	Italian ryegrass
Panicum dichotomiflorum Michx.	fall panicgrass
Polygonum convolvulus L.	knotweed
Polygonum lapathifolium L.	knotweed
Salsola iberica Sennen & Pau	thistle
Senecio vulgaris L.	common groundsel
Setaria verticillata (L.)	foxtail
Sorghum halepense (L.) Pers.	Johnson grass
Xanthium spinosum L.	common cockleburr
Xanthium strumarium L. (reistant to imidazolinone)	Noogoora burr

According to Idaho State Department of Agriculture (ISDA), inspection, cleaning and hygienic storage methods are used to prevent infestation and contamination of export sweetcorn seed with arthropod pests and weed seeds. These measures are considered to be effective in mitigating the risk of arthropod pests and weeds in export sweetcorn seed. Details of these measures and their relevance in terms of mitigating risk are given in Section 7.

Ustilago zeae is present in Idaho, however, its incidence has been decreased through the widespread planting of resistant hybrids. Most commercial seed production fields are now free of *U. zeae*. Yield losses from this disease rarely exceed two percent, however, high levels of infection may be recorded after hail damage. *Ustilago zeae* is present in some parts of NSW and Qld, and the movement of *Z. mays* seed for sowing is under official control in New South Wales, South Australia, Tasmania, Victoria and Western Australia. Interstate restrictions vary, but include acceptance of area freedom and seed treatment with an appropriate fungicide. Further details on *U. zea* are provided in the datasheet at Annexure 1.

The seed-borne viruses; HPV, MDMV and WSMV are present in Idaho, however, according to ISDA, most commercial sweetcorn seed production fields in Idaho are free of these viruses. Further information on the status of HPV, MDMV and WSMV is given in the datasheets at Annexure 1.

6 OTHER ASSESSMENTS

6.1 Weed Risk Assessment

The weed potential of sweetcorn was assessed by the TWG on weeds as a part of the IRA for the importation of bulk maize grain from the United States (AQIS, 1999). Sweetcorn was found to have no weed potential.

6.2 Environmental Impact Assessment

AQIS has considered the potential environmental impact of imports of *Z. mays* seed from the USA (AQIS, 1999). AQIS is satisfied that the importation of sweetcorn seed from Idaho under conditions specified in this paper will present negligible risk to the

environment, and accordingly that the obligations arising from the Administrative Procedures made under the *Environment Protection (Impact of Proposals) Act 1974* have been met. AQIS notes that imports of genetically modified sweetcorn seed may present a potential risk to the Australian environment. To address this risk, AQIS requires importers to declare importations of genetically modified sweetcorn seed. Applications to import genetically modified organisms (GMOs) require assessment by the Interim Office of the Gene Technology Regulator (IOGTR) in consultation with AQIS and other relevant government agencies. AQIS does not issue import permits for GMOs unless the importers obtain IOGTR clearance.

7. PHYTOSANITARY RISK MANAGEMENT OF QUARANTINE PESTS OF SWEETCORN SEED FROM IDAHO

AQIS has considered the management options that would be practical and achievable in Idaho and Australia and that might effectively address the potential risks of introduction of quarantine pests. Based on seed certification information obtained in June 1999 during a visit to Idaho by an AQIS official, it is AQIS's preliminary view that Idaho can produce high health, clean sweetcorn seed to address Australia's pest risk concerns, and that the integrity of Idaho-grown sweetcorn seed can be maintained throughout the production and transport chain. Table 5 summarises proposed risk management options for quarantine pests associated with sweetcorn seed from Idaho.

AQIS notes that the potential quarantine risks associated with Idaho-grown sweetcorn seed are lower than for imports of bulk maize grain imports from the United States. Imports of bulk maize grain from the United States would require much more complex arrangements to ensure the acceptability of some risk management options such as "area freedom", "field inspections", "testing", "cleaning", "fumigation" and "identity preservation".

Table 5 Proposed risk management measures for quarantine pests of sweetcorn seed from Idaho

Quarantine Pest	Common Name	Section	Risk Management Measures
ARTHROPODS			
Cryptolestes turcicus (Grouvelle)	flat grain beetle	7.1	Packing house pest management measures; pre-export seed inspection and certification; on- arrival inspection; fumigation; re-export; destruction.
Cynaeus angustus (LeConte)	large black flour beetle		
Glischrochilus quadrisignatus Say	four spotted sap beetle		
Tribolium audax Halstead	American black flour beetle		
Tribolium brevicornis (LeConte)	flour beetle		
Trogoderma glabrum (Herbst)	glabrous cabinet beetle		
Trogoderma inclusum LeConte	large cabinet beetle		
Trogoderma ornatum Say	ornate cabinet beetle		
Trogoderma variabile Ballion	warehouse beetle		
FUNGUS			
Ustilago zeae (Beckm.) Unger	boil smut; common smut	7.2	Pest free area; seed treatment.
VIRUSES			
High Plains *tenuivirus*	High Plains disorder	7.3	Cultural practices; pest free area.
Maize dwarf mosaic *potyvirus*	maize dwarf mosaic		
Wheat streak mosaic *rymovirus*	wheat streak mosaic		
WEEDS			
Ambrosia artemisiifolia L.	common ragweed	7.4	Pre-export seed cleaning; pre-export inspection and certification; on-arrival inspection; processing; re-export; destruction.
Ambrosia trifida L.	giant ragweed		
Ampelamus albidus (Nutt.) Britt. ***Apocynum cannabinum*** L.	honeyvine milkweed hemp dogbane		
Berteroa incana (L.) DC.	hoary Alison		
Bromus tectorum L.	downy brome		
Cenchrus longispinus (Hack.) Fern.	longspine sandbur		
Cirsium arvense (L.) Scop.	Canada thistle		
Conringia orientalis (L.) Dumort.	hare's ear		
Datura inoxia Miller	downy thornapple		
Datura stramonium L.	jimsonweed		
Daucus carota L.	wild carrot		
Equisetum arvense L.	common horsetail		
Euphorbia supina Raf. ex Boiss	prostrate spurge		
Kochia scoparia (L.) Schrad.	kochia		
Lolium multiflorum Lam. (herbicide resistant)	Italian ryegrass		
Panicum dichotomiflorum Michx.	fall panicgrass		
Polygonum convolvulus L.	knotweed		
Polygonum lapathifolium L.	knotweed		

Quarantine Pest	Common Name	Section	Risk Management Measures
Salsola iberica Sennen & Pau	thistle		
Senecio vulgaris L.	common groundsel		
Setaria verticillata (L.)	foxtail		
Sorghum halepense (L.) Pers.	Johnson grass		
Xanthium spinosum L.	common cockleburr		
Xanthium strumarium L. (resistant to imidazolinone)	Noogoora burr		

7.1 Management Options for Arthropod Pests

7.1.1 Pre-export inspection and certification of seed

Freedom from quarantine pests would be verified by pre-export visual inspection. APHIS-approved inspectors could sample seed according to the International Seed Testing Authority (ISTA) rules, and inspect and certify seed for freedom from quarantine pests.

7.1.2 On-arrival inspection

On-arrival inspection is an option for verifying the arthropod pest status of imported seed. AQIS inspectors are qualified in sampling imported seed consignments according to ISTA rules, and inspecting for the presence of quarantine pests.

7.1.3 Fumigation

If live arthropod pests of quarantine concern are detected in sweetcorn seed, fumigation of the consignment with phosphine (section 7.1.3.1) or methyl bromide (section 7.1.3.2) would be an effective risk management option.

7.1.3.1 Phosphine

Arthropod pest concerns would be addressed by phosphine fumigation @ 1.0 to 1.5g/m³ for 10 days at temperatures between 15°C to 25°C, or, 1.0 to 1.5g/m³ for seven days at temperatures above 25°C. At the completion of the fumigation, the phosphine concentration needs to be at least 0.1g/m³; phosphine would not be used at 15°C, or below.

7.1.3.2 Methyl bromide

Arthropod pest concerns would be addressed by methyl bromide fumigation @ 32g/m³ for 24 hours at 21°C with a minimum concentration of 24g/m³ at normal atmospheric pressure. If the temperature during fumigation is expected to fall below 21°C, add 8g/m³ for each 5°C below 21°C. If the temperature during fumigation is expected to increase above 21°C, subtract 8g/m³ for each 5°C above 21°C. The minimum temperature during the course of the fumigation is to be used for the calculation of the dose.

7.1.4 Preferred option

Following discussions with ISDA research scientists and seed companies in Idaho regarding the feasibility of various management options, AQIS considers that seed production, harvesting and storage methods in place in Idaho would be effective in eliminating the quarantine arthropod pests listed in Table 4 from export sweetcorn seed. APHIS would be able to inspect and certify export sweetcorn seed as free from arthropod pests. This would be verified by on-arrival seed inspection by AQIS. If live stages of any quarantine arthropod pest were found during on-arrival inspection, the infested lot(s) would be fumigated, re-exported or destroyed.

7.2 Management Options for *Ustilago zeae*

7.2.1 Pest free area status

Pest free area would be an option for managing risks of introduction of boil smut (*U. zeae*). According to ISDA most commercial sweetcorn seed production fields in Idaho remain free from *U. zeae*. However, the boil smut free status of export fields may be compromised by hail damage, which would predispose plants to infection.

7.2.2 Seed treatment

Seed treatment with an effective fungicide(s) would be a satisfactory option to address the risk of introduction of *U. zeae* to new areas as a contaminant of sweetcorn seed. APHIS would need to ensure that the export seed is treated with an effective fungicide(s).

New South Wales, Victoria and Western Australia permit entry of seeds for sowing subject to fungicide seed treatment for *U. zeae*. These states accept seed treatments with

Vitavax FF 200® (active ingredients; thiram 200g/l and carboxin 200g/l) @ 500 ml/100 kg seed. The New Zealand Ministry of Agriculture and Forestry accepts treatment of sweetcorn seed with any of the following fungicide combinations as management options for addressing the risk of introduction of *U. zeae* to New Zealand in imports of sweetcorn seed:

carboxin@ 0.8g active ingredient (a.i.)/kg seed and thiram @1g a.i./kg seed;

carboxin @ 0.8g a.i/kg seed and captan @ 0.7g a.i./kg seed;

imazalil @ 0.08g a.i./kg seed and triadimenol@ 0.22g a.i./kg seed; or

imazalil@ 0.08g a.i./kg seed and flutriafol @ 0.08g a.i./kg seed.

7.2.3 Preferred option

Seed treatment is the preferred option as it is the least restrictive method of effectively managing the risk of introduction of *U. zeae* to Australia in sweetcorn seed imports. The seed would be treated with a mixture of carboxin @ 1g/kg seed and thiram @ 1g/kg seed or another AQIS-approved fungicide(s) effective against *U. zeae*.

7.3 Management Options for Viruses

7.3.1 Cultural practices

AQIS proposes that producers of export sweetcorn seed be required to employ cultural management practices to control quarantine viruses. Resistant sweetcorn hybrids are now widely planted in the United States, and have proved to be effective in minimising the impact of HPV, MDMV and WSMV. The potential risk of HPV and WSMV infection by wheat curl mites, which may migrate from senescing, infected hosts, particularly wheat would be reduced by planting export crops as early as possible in the season and isolation of export fields from wheat field(s). In Idaho, 30 metres (approximately 100 feet) isolation would be achievable. The risk of virus infection of export fields would also be decreased if the export fields have not recorded HPV, MDMV or WSMV outbreaks previously. ISDA maintains records of export fields and would be able to ensure that export fields were not known to have experienced an

outbreak of these viruses in at least the two years preceding the planting of the export crop.

7.3.2 Pest free area

In accordance with the International Standards for Phytosanitary Measures No. 2 (FAO, 1996b), pest free area is an option for managing risks of quarantine pests. ISDA officers have advised AQIS that they would be able to provide pest free area assurances for the place of production (export field) for HPV, MDMV and WSMV which would be verified by export crop inspections and testing.

Export sweetcorn crops would need to be visually inspected for virus symptoms twice during the growing season by APHIS-approved inspectors to detect the presence of quarantine viruses. The first inspection would be at the four to five leaf growth stage, and the second within four to five weeks after tasselling initiation. Inspection of 10 per cent of each export crop would be achievable in Idaho. Sweetcorn plants exhibiting virus symptoms during visual inspection would be tested using ELISA or another reliable method for the detection of HPV, MDMV and WSMV. The leaf samples may be tested in batches of a maximum of ten samples. Similar testing of leaf samples from 300 plants selected at random from the export field during the second inspection would be conducted. Where export seed is sourced from less than 300 plants, the plants would be sampled to provide 95 percent level of confidence of detecting one percent infected plants (Table 1(b), page 16, Cannon & Roe, 1982).

7.3.3 Preferred option

A combination of cultural practices and pest-free area (place of production) certification would be the preferred option of managing the risks of quarantine viruses.

The potential for cross-infection of export crops with HPV and WSMV from wheat fields by the mite vector would be decreased by planting export crops early in the season, i.e., in April/May, and maintaining isolation of 30 metres from wheat field(s). The risk would also be reduced if these viruses were not known to occur in export fields for a period of two years prior to the planting of the export crop.

The HPV, MDMV and WSMV free status of export fields would need to be verified by export crop inspections and testing. APHIS would need to certify that 10 percent of each export crop was inspected twice; at the four to five leaf growth stage, and within four to five weeks after tasselling initiation. APHIS would also need to certify that sweetcorn plants exhibiting virus symptoms during the inspections, and 300 plants selected at random from the export field during the second inspection, were tested using ELISA or another reliable method for the detection of HPV, MDMV and WSMV. APHIS would need to retain test results for audit by AQIS and trace-back, if required.

7.4 Management Options for Weeds

7.4.1 Pre-export seed cleaning

The routine cleaning procedures being used in packing houses in Idaho would remove contaminant weed seeds. According to AQIS's discussions in Idaho with ISDA research scientists, seed technologists and seed companies, Idaho-grown sweetcorn seed is extremely unlikely to contain weed seeds.

7.4.2 Pre-export inspection and certification

Pre-export visual inspection of sweetcorn seed would be effective in verifying freedom of export seed from quarantine weed seeds. APHIS could certify freedom of export sweetcorn seed from weed seeds.

7.4.3 On-arrival inspection

AQIS proposes that imported sweetcorn seed is sampled by AQIS inspectors according to ISTA rules and inspected to verify freedom from quarantine weed seeds.

7.4.4 Preferred option

Following discussions with ISDA research scientists and seed companies in Idaho, AQIS considers that seed production, harvesting and packing house cleaning methods in place in Idaho would virtually eliminate the weed seeds listed in Table 4 from export sweetcorn seed. APHIS would be able to certify freedom of export sweetcorn seed from weed seeds. This would be verified by pre-export and on-arrival seed inspections. If weed seeds were found during on-arrival inspection, the consignment would be cleaned

to remove the weed seeds, or processed, or re-exported, or destroyed under quarantine supervision.

8. PROPOSED MANDATORY IMPORT REQUIREMENTS

This section describes the proposed mandatory phytosanitary requirements to be implemented to mitigate quarantine risks associated with the importation of Idaho-grown sweetcorn seed into Australia.

8.1 Import Permit Requirement

An AQIS import permit would be required for the importation of sweetcorn seed for sowing from Idaho to Australia.

8.2 Export Field Registration

All export sweetcorn seed production fields would be registered by APHIS, and would be required to comply with APHIS export field standards. Each field would be allocated a unique serial number, which may be combined with the grower number to enable trace-back in the case of non-compliance. APHIS would be required to keep maps showing the location and registration number of each export field. APHIS would need to conduct random audit checks to monitor precautions to prevent mixing or substitution of export seed with non-export seed.

APHIS would be required to ensure that HPV, MDMV or WSMV were not known to occur in the export fields for a period of two years prior to planting of the export crop. The export field would need to be isolated from any wheat field(s) by a minimum distance of 30 metres (approximately 100 feet).

8.3 Field Sanitation and Pest Control Measures

The hygiene of export crops would be maintained by appropriate pest management options to ensure that inspection for HPV, MDMV and WSMV is not impeded due to the presence of other pests masking virus symptoms. To reduce the risk of introduction of quarantine pests to export fields, only Idaho-grown seed would be used for planting

export crops. Export crops should preferably be planted in April/May, in order to minimise the potential risk of HPV and WSMV infection by wheat curl mites, which may migrate from senescing infected hosts, particularly wheat, to the export crop.

8.4 Export Crop Inspection and Testing

APHIS-approved inspectors would need to conduct two visual inspections, each of a minimum of 10 percent of the export crop, for pests of quarantine concern to Australia. The first inspection would be conducted at the four to five leaf stage, and the second within four weeks after tasselling initiation.

In addition, leaf samples from 300 plants selected at random from the export field during the second inspection would be tested using ELISA or another reliable method for the detection of HPV, MDMV and WSMV. Where export seed is sourced from less than 300 plants, the plants would be sampled to provide 95 percent level of confidence of detecting one percent infected plants. The leaf samples may be tested in batches of a maximum of ten samples.

APHIS would need to ensure that the inspector(s) is familiar with disease symptoms of the quarantine pests of concern to Australia. Plants exhibiting disease symptoms would need to be submitted to an APHIS-approved plant pathologist for identification, and records of results of all tests would be kept by APHIS for audit checks by AQIS.

Sweetcorn plants exhibiting virus symptoms during visual inspection would need to be tested using ELISA or another reliable method for the detection of HPV, MDMV and WSMV. Seed from export fields in which HPV, WSMV or MDMV is detected would not be eligible for export to Australia.

8.5 Packing House Registration and Procedures

All packing houses handling export seed would need to be approved and registered with APHIS, for trace-back purposes. APHIS would be required to keep records of all exports of sweetcorn seed to Australia for a period of two years for trace-back.

The manager of the packing house (the conditioner) would need to ensure that machinery and storage facilities used for handling export seed would be thoroughly cleaned prior to use with the export seed. The manager of the packing house would be required to ensure that export seed is thoroughly cleaned to remove extraneous matter (e.g., trash, soil, weed seeds, arthropod pests). The manager of the packing house would need to ensure that export seed is segregated from non-export seed at all times.

APHIS would be required to conduct random audit checks on approved packing houses to monitor precautions to prevent mixing or substitution of export seed with non-export seed, contamination with weed seeds, and infestation with arthropod pests, including a pest control program.

APHIS would be required to suspend exports from packing houses that fail to comply with this section.

8.6 Pre-export Seed Inspection

APHIS-approved inspectors would need to sample export seed according to ISTA rules and inspect the consignment for all visually detectable quarantine pests specified by AQIS.

8.7 Notification

APHIS should notify AQIS immediately of any change in the status of quarantine pests recorded in the United States and Idaho. Any change to the status of the quarantine pests may result in immediate suspension of trade until the outcome of a joint AQIS and APHIS investigation is known.

8.8 Pre-export Seed Treatment for *Ustilago zeae*

All sweetcorn seed for export to Australia would need to be treated with a mixture of carboxin @ 1g/kg seed and thiram @ 1g/kg seed or another AQIS-approved fungicide(s) effective against *U. zeae*.

8.9 Packing and Labeling

Export seed would need to be packed in new bags, which would be of a woven or gas permeable material such as hessian, and without plastic liners.

Each bag would be clearly labelled "*FOR EXPORT TO AUSTRALIA*" and bear the serial number of the approved export field and packing house.

8.10 Phytosanitary Certification

Upon completion of seed sampling and inspection, APHIS would issue a Phytosanitary Certificate for each consignment, containing the following information:

- the appropriate 'serial number', packing house number, number of bags per consignment and date.

- An additional declaration stating that "Seed was produced in accordance with AQIS's requirements, including inspection and testing of export seed crops for High Plains *tenuivirus*, wheat streak mosaic *rymovirus* and maize dwarf mosaic *potyvirus*". (AQIS would advise APHIS of its requirements upon finalisation of the import conditions).

- APHIS would be required to insert in the Phytosanitary Certificate the details of the AQIS-approved fungicide seed treatment applied for *Ustilago zeae*.

8.11 On-arrival Inspection of Phytosanitary Documents

An AQIS officer would inspect phytosanitary documents relating to imported sweetcorn seed. Any consignment with incomplete documentation, or certification that does not conform to specifications would be refused entry, with the option of re-export or destruction. AQIS would notify APHIS immediately of action taken.

8.12 On-arrival Inspection and Treatment of Seed

AQIS would draw samples according to ISTA rules from all consignments of imported sweetcorn seed. If trash, soil and other extraneous matter are found in the consignment,

importers would be offered the option of cleaning the seed, re-export, processing or destruction. If cleaning is the accepted option, the consignment would be directed to approved quarantine premises. Removal and incineration of extraneous matter would be carried out under quarantine supervision.

All potential quarantine pests found during on-arrival inspection would need to be forwarded to the appropriate AQIS Quarantine Station for full identification prior to treating a non-compliant consignment. AQIS would undertake to provide the results of pest interceptions to APHIS.

If live stages of a quarantine arthropod pest are intercepted during on-arrival inspection, the affected seed lot(s) would be fumigated with phosphine or methyl bromide.

If a quarantine pest for which pest free area status is specified is detected during on-arrival inspection, AQIS would need to review the import conditions and may suspend the importation of sweetcorn seed immediately pending the outcome of a joint AQIS/APHIS investigation.

8.13 Review of Import Requirements

AQIS, in consultation with APHIS, would review the import requirements in the event that circumstances or information warrant such action.

9. AUSTRALIA'S APPROPRIATE LEVEL OF PROTECTION

Based on the findings of the IRA, AQIS's preliminary view is that Australia would achieve its appropriate level of protection by importing sweetcorn seed from Idaho under the proposed management conditions.

The risk of contamination of sweetcorn seed with spores of *U. zeae* would be mitigated with effective seed treatments. This is consistent with Australian inter- and intra-state measures for preventing spread of *U. zeae* to new areas. AQIS believes that the risk of introduction of *U. zeae* with spores is low, however, it is prudent to use a precautionary seed treatment.

AQIS considers that the risk of introducing HPV, MDMV and WSMV to Australia through imports of Idaho-grown sweetcorn seed would be mitigated by APHIS certification of freedom of export fields from these viruses based on inspections and testing of export crops. The acceptance of pest free status of the place of production is consistent with the FAO requirements for the establishment of pest free areas (1996b).

Idaho-grown sweetcorn seed is unlikely to contain quarantine arthropod pests and weed seeds as a consequence of crop production and post harvest management practices. This would be verified by inspections of representative samples drawn according to ISTA rules, and if these pests were intercepted they would be eliminated by well-established quarantine measures routinely used by AQIS for addressing the risk of quarantine pests. For example, fumigation would remove the risk of arthropod pests, and cleaning would effectively remove weed seeds from sweetcorn seed.

The management of quarantine risks off-shore is consistent with AQIS's policy to permit imports of various high health plants, animals and their products, including APHIS-certified seeds of beans, peas and lucerne from the United States.

10. REFERENCES

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