



**NAPPO**

North American Plant Protection Organization

Organización Norteamericana de Protección a las Plantas

**MEXICO - USA - CANADA**

## **NAPPO Regional Standards for Phytosanitary Measures (RSPM)**

### **RSPM 13**

### **Guidelines to Establish, Maintain and Verify Karnal Bunt Pest Free Areas in North America**

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## Review

NAPPO Standards for Phytosanitary Measures are subject to periodic review and amendment. This standard was last reviewed in 2015. The next review date for this NAPPO Standard is 2020. A review of any NAPPO Standard may be initiated at any time upon the request of a NAPPO member country.

## Approval

This Standard was approved by the North American Plant Protection Organization (NAPPO) Executive Committee on October 14, 2001, and revised on October 19, 2009. The current revision was approved on xxxx, and is effective from this date.

Signed by:

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## Implementation

No Implementation Plan is required.

## Amendment Record

Amendments to this Standard will be dated and filed with the NAPPO Secretariat.

## Distribution

This standard is distributed by the NAPPO Secretariat, to the Industry Advisory Group (IAG) and Sustaining Associate Members (SAM), the International Plant Protection Convention (IPPC) Secretariat, and to other Regional Plant Protection Organizations (RPPOs).

## Introduction

### Scope

This standard provides the guidelines to establish, maintain, and verify Karnal bunt pest free areas (PFA) in North America. This applies to seed and grain of wheat, triticale and other hosts and regulated articles. It also describes the role of the National Plant Protection Organization (NPPO) to ensure compliance with this standard.

### References

ISPM 4. 1995. *Requirements for the establishment of pest free areas*. Rome, IPPC, FAO.

ISPM 5. (Updated annually). *Glossary of phytosanitary terms*. Rome, IPPC, FAO.

ISPM 6. 1997. *Guidelines for surveillance*. Rome, IPPC, FAO.

ISPM 10. 1999. *Requirements for the establishment of pest free places of production and pest free production sites*. Rome, IPPC, FAO.

RSPM 5. (Updated annually). *NAPPO glossary of phytosanitary terms*. Ottawa, NAPPO.

RSPM 21. 2009. *A harmonized procedure for morphologically distinguishing teliospores of Karnal bunt from ryegrass bunt, rice smut and similar smuts*. Ottawa, NAPPO.

SAGARPA 2002.-Establishing the national campaign for Karnal bunt of wheat. Norma Oficial Mexicana NOM-001-FITO-2001, Mexico.

### Definitions

Definitions of phytosanitary terms used in this standard can be found in NAPPO RSPM 5 and in ISPM 5.

### Background

Karnal bunt of wheat and triticale is caused by the fungus *Tilletia indica* Mitra, a seed-borne pathogen. The natural hosts of *Tilletia indica* are wheat species (*Triticum* spp.) and triticale (*Triticale hexaploide*). The planting of infected or infested wheat and /or triticale seed poses the greatest risk for spreading Karnal bunt. In addition, spores of the pathogen can potentially be carried in host hay or straw, conveyances, used bags, farm equipment, soil, etc.

Unlike the rust pathogens of wheat, to date there is no firm evidence to suggest that Karnal bunt spreads by wind. As such, restrictions on the movement of infected or infested host material or other articles that might spread spores, as well as cleaning of agricultural machinery especially threshing machines, are considered appropriate options to prevent the spread of Karnal bunt from infested to non-infested areas.

Phytosanitary certification by an NPPO for the absence of Karnal bunt could be based on a Karnal bunt pest free area. Any country has the sovereign right to establish a PFA. However, it is important that guidelines are established to ensure North American consistency in establishing, maintaining, and verifying Karnal bunt pest free areas that will facilitate their recognition by trading partners.

A PFA for Karnal bunt can occur naturally or can be created as a result of integrated pest eradication measures. A PFA is usually delimited by recognizable geographical or political boundaries. In the absence of physical barriers to prevent the possible spread of Karnal bunt from adjacent infected areas, a buffer zone may be defined. The size of this PFA (and its buffer zone, if required) and the strength of the phytosanitary measures will depend on the geographical distribution of the pest, its prevalence and level of damage, and on the particular characteristics of the area.

Prior to establishing an area as free of Karnal bunt, the NPPO should assure itself that it has met the requirements of this standard and the relevant International Standards for Phytosanitary Measures, in particular ISPM 4: 1995.

## **Outline of Requirements**

This standard describes the phytosanitary procedures to establish, maintain and verify Karnal bunt free areas. It recommends surveillance approaches, sampling and testing methodologies and restrictions on the movement of regulated articles. The standard also addresses non-compliance and the strength of corrective actions. The standard sets a general framework for the application of the concept of PFAs for Karnal bunt. Bilateral agreements may be required to elaborate further on any of the items in this standard.

## **Specific Requirements**

The NPPO is responsible for the establishment, maintenance and verification of a PFA. Other public officers and private individuals and organizations may participate in the delivery of the program under the authority of the NPPO. The NPPO plays a role in documentation requirements, surveillance, consultation resulting in termination/reinstatement of a PFA and implementation of corrective actions in the event of detection of Karnal bunt.

### **1. Establishment of a Karnal bunt free area**

The NPPO of the country seeking recognition of a Karnal bunt PFA should document the following geographic, production, regulatory measures or phytosanitary requirements for movement of regulated articles, surveillance and sampling data:

#### **1.1 Geographic description of the pest free area**

- Information should be provided on delimitation of the Karnal bunt pest-free area which should include its location and geographic coordinates illustrated by maps that indicate its limits. A description of prevailing climatic conditions, cultivated host material and how the PFA is isolated from Karnal bunt infested areas should also be provided.

- Provide a description of infested areas near the PFA indicating their distance from Karnal bunt quarantined areas, level of infection (if that assessment is made), cultivated hosts, infested surface area or size of field, geographic coordinates, and climatic conditions.
- If there is a buffer zone between the PFA and the infested areas, its size, geographic boundaries, cultivated crop species must be indicated as well as a description of the reasons why it was established. The size of this buffer zone will need to be determined on a case by case basis, taking into account the relevant factors which could impact on the establishment and spread of Karnal bunt.
- Provide information on controls or points of verification of movement and illustrate these by maps that indicate actual limits/boundaries, as well as any major landmarks, roads, sea ports, airports, etc.

## 1.2 Production information

- Information on the general classification of the crop.
- The location of wheat for grain and seed production as well as triticale, if required.
- Acreage/hectares/volume of wheat and triticale,
- Location of commercial storage and processing facilities (if applicable) to determine sampling methodology, if required.

## 1.3 Movement of regulated articles

- Karnal bunt should be officially listed as a quarantine pest.
- International and national restrictions on the movement of regulated articles are required to prevent the introduction of Karnal bunt into a PFA.
- An appropriate inspection program should be established for the regulated articles which could include sampling and testing, verification of documents, confirmation of treatments when required, or quarantine actions, and in some cases, the use of control points for verification.
- Only Karnal bunt free seed may be moved into and planted in the PFA.

## 1.4 Surveillance

Two types of surveillance are possible to establish a Karnal bunt PFA. These are 1) general surveillance and 2) specific surveys (as defined in ISPM 4:1995). General surveillance is a process whereby information on particular target pests is gathered from many sources wherever it is available and as specified in ISPM 6: 1997 and provided for use by the NPPO. Specific surveys are procedures by which NPPOs obtain information on target pests on specific sites in an area over a defined period of time. These surveys may include official delimiting and detection surveys which should follow a plan approved by the NPPO.

These types of surveys can be used separately or in combination for the establishment of a Karnal bunt free area as recommended in the following situations; the selected sampling intensity should provide an adequate level of detection.

### 1.4.1. In countries where Karnal bunt has never been detected:

- Data obtained from general surveillance may be sufficient to demonstrate

a PFA. The NPPO should refer to ISPM 6: 1997.

#### 1.4.2. In countries where Karnal bunt exists:

- In areas where Karnal bunt has never been detected
  - In order to initially establish a Karnal bunt PFA in geographically separated areas (defined by physical or political boundaries); detection surveys at points of aggregation or fields should be conducted for 3 consecutive years or for up to 6 years if areas are surveyed on alternating years with negative results at the specified sampling intensity (see 1.5.4 below)
- In areas where Karnal bunt has been detected
  - Infested fields must be under surveillance for a total of 5 years (the years need not be consecutive) before a PFA can be established. Within this 5 year period the harvested grain must be sampled and tested for Karnal bunt annually. Five years of negative test results is required at the sampling intensity indicated - see section 1.5.4.
  - If planted to a host crop, the field must be seeded with Karnal bunt free seed. Alternatively, infested fields that do not produce a host crop that can be sampled and tested must undergo a form of tillage at least once during the production year in order for this year to be included towards the 5 year surveillance requirement.

### 1.5 Sampling and testing methodology

Each country may select and use sampling methodologies and diagnostic testing approved by the NPPO. The following methodologies are recommended, but alternative methodologies may also be appropriate:

#### 1.5.1. Testing methodology (See Appendices)

- Size selective sieve (SSS) seed wash method for teliospores (USDA and SAGARPA)
- Modified SSS method (CFIA)
- Direct examination for bunted kernels (USDA)

#### 1.5.2. Sample size (based on existing practices)

- Grain (SSS seed wash for teliospores) – a minimum 50 gram sub sample for the test derived from a 3.4 pound (1.5 kg) or greater sample.
- Grain (direct examination for bunted kernels) – 3.4 pound (1.5 kg) sample. The entire sample must be examined.
- Seed – same as for grain - but sample size and/or collection methodology may vary depending on the availability of the seed and agricultural practices.

#### 1.5.3. Sampling methodology

- Random samples should be collected during the transfer of grain or seed



- using a mechanical sampler, when available.
- Samples can also be collected randomly from grain or seed with a probe.

#### 1.5.4. Sampling intensity

The sampling intensity may vary depending on the agricultural practices, grains collection and distribution system and national plant protection organization requirements:

- From areas which are geographically separate from infested areas and where Karnal bunt has not previously been detected, sampling will be done according to the requirements of each NPPO per growing season for a minimum 3 consecutive years or for up to 6 years if areas are surveyed on alternating years.
- From areas where Karnal bunt had been present, sampling will be done according to the requirements of each NPPO per year growing season, for a minimum of 5 consecutive years where a host crop has been grown. Alternatively, infested fields that do not produce a host crop that can be sampled and tested may undergo a form of tillage at least once during the production year in order for this year to be included towards the 5 year requirement.
- From a buffer zone, if one has been established, sampling will be done each growing season according to the requirements of each NPPO.

## 2. Maintenance of a Karnal bunt pest free area

In order to maintain the PFA status, the NPPO of each country will document the phytosanitary measures which include the following:

- Movement of regulated articles
- Surveillance
- Testing and sampling

### 2.1 Movement of regulated articles

- Karnal bunt should be officially listed as a quarantine pest.
- International and national restrictions on the movement of regulated articles are required to prevent the introduction of Karnal bunt into a PFA.
- An appropriate inspection program should be established for the regulated articles which could include sampling and testing, verification of documents, confirmation of treatments when required, or quarantine actions.
- Only Karnal bunt free seed may be planted in the PFA.

### 2.2 Surveillance

Two types of surveillance are possible for maintaining a PFA status. These are 1) general surveillance and; 2) specific surveys (See Section 1.4).

These types of surveys can be used separately or in combination for the maintenance of a PFA as recommended in the following situations. These surveys may include official delimiting and detection surveys which should follow a plan approved by the

NPPO.

2.2.1 In countries where Karnal bunt has never been detected:

- Data obtained from general surveillance may be sufficient to maintain a PFA. The NPPO should refer to ISPM 6:1997.

2.2.2 In countries where Karnal bunt exists:

- In areas where Karnal bunt has never been detected
  - Data obtained from general surveillance may be sufficient to maintain a PFA. The NPPO should refer to ISPM 6: 1997.
- In areas where Karnal bunt has previously been detected but are now considered PFA<sub>7</sub>
  - If detection surveys at points of aggregation or fields have been conducted for 3 consecutive years or for up to 6 years if areas are surveyed on alternating years with negative results at the specified sampling intensity, data obtained from general surveillance may be sufficient to maintain a PFA. The NPPO should refer to ISPM 6: 1997. The NPPO may conduct periodic monitoring surveys as part of the general surveillance in these areas (see Section 3.0)
- From a buffer zone, if one is still maintained, the sample intensity should be of one sample per five fields per year.

### 2.3 Testing and sampling methodology

Each country may select and use testing and sampling methodologies to establish their appropriate level of protection. The following methodologies are recommended, but alternative methodologies may be appropriate:

2.3.1. Testing methodology (See Appendices)

- same as for establishment of the PFA, see Section 1.5.1

2.3.2. Sample size (based on existing practices)

- same as for establishment of the PFA, see Section 1.5.2

2.3.3. Sampling methodology

- same as for establishment of the PFA, see Section 1.5.3

2.3.4. Sampling intensity – please refer to Section 2.2

### **3. Verification of a Karnal bunt free area**

The NPPO must verify compliance with the requirements to establish and maintain the PFA. Any verification survey conducted by the NPPO should follow a sampling intensity of one sample per two million bushels (54,000 t). The absence of reports of Karnal bunt from importing countries testing shipments could also contribute to verification of Karnal bunt free area maintenance.

### **4. Change of the Pest Free Area Status**

#### **4.1 Presence of pest**

Upon the detection of Karnal bunt within a PFA, the PFA status should be immediately suspended. Upon removal of the source of contamination, the PFA status may be reinstated.

If the source of contamination cannot be easily determined or removed, the following options are possible:

- If Karnal bunt is detected in a limited area which can be identified and isolated, then the PFA may be re-defined to exclude the infected area; or
- The PFA status is terminated.

#### **4.2 Faulty procedures**

A change in the PFA status may also occur as a result of non-compliance to this standard (surveys, sampling and testing, movement controls, documentation, etc.).

An importing country should officially notify the exporting country if it no longer recognizes the PFA status. The decision to terminate a PFA should depend on the severity of the non-compliance and documentation provided.

### **5. Reinstatement of the Pest Free Area Status**

Successful eradication of Karnal bunt and implementation of corrective actions are critical to reinstatement of the PFA status. The PFA status can only be reinstated when compliance with the requirements for establishment of the PFA, as outlined in this standard, are met.

In order to gain recognition of a redefined PFA, the infected portion of the original PFA must be defined and excluded. Phytosanitary measures to prevent the introduction of Karnal bunt into the revised PFA must be implemented.

### **6. Contingency Plans**

The NPPO should have a contingency plan which describes the corrective actions which will take place in the event that Karnal bunt is detected in a PFA. The actions may include:

- If Karnal bunt is detected in a consignment arriving at the PFA, the consignment should be removed, disposed of, or returned to origin.
- If Karnal bunt is detected in a storage facility within the PFA, investigation and

traceback should be implemented as soon as possible to determine the source of the Karnal bunt infection. The infested grain or seed should be disposed of, treated, or processed in a manner to kill the pathogen.

- If Karnal bunt is detected in production areas in the PFA, phytosanitary measures and delimiting surveys must be implemented immediately and the PFA terminated, suspended and/or redefined.
- The NPPO should prepare a report confirming phytosanitary measures taken (including delimiting surveys) and any actions taken to, suspend, reinstate, redefine or terminate the PFA.

## **7. Documentation**

Documentation supporting the Karnal bunt free area should be made available to the importing country upon request. Recognition of the PFA by an importing country may be confirmed in a bilateral agreement.

Technical reports of all surveillance activities carried out in the fields, storage facilities, processing plants and verification points should be compiled by the NPPO and kept for at least three years.