



EXERCISE REPORT

2015–2016



Report published June 2017

About the report

The *Exercise Haryana Report* was authored by Plant Health Australia (PHA) in consultation with the Exercise Planning Committee. The purpose of this report is to provide a summary of activities and a critical analysis of the outcomes and learnings. The information presented was informed by the activity evaluations, debriefings conducted, exercise outputs and the observations of the Exercise Planning Committee.

Any feedback or questions in relation to the report, or the Exercise Haryana activities and outcomes can be directed to PHA through the details below.

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In referencing this document, the preferred citation is: Plant Health Australia (2017) *Exercise Haryana Report*. Plant Health Australia, Canberra, ACT.

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Executive summary

Exercise Haryana delivered a suite of discussion and functional activities to improve the ability to implement a rapid national response to a Karnal bunt (*Tilletia indica*) detection in Australia. Karnal bunt is an exotic pest that impacts wheat, triticale and durum grain quality and its establishment in Australia would close international and domestic markets. The activities were centred around the simulation scenario of a detection of Karnal bunt in a bulk handling facility on the Eyre Peninsula in South Australia.

Activities delivered under the Exercise Haryana program varied from intra-organisational discussions, through to on-farm functional activities and national workshops. Through this breadth of activities, Exercise Haryana delivered against its objectives and generated a broad range of outcomes and findings. Highlights of the outcomes and findings are presented below, aligned to six key themes.

1. **Tracing** movement of Karnal bunt risk vectors, particularly grain, is an essential component of emergency response operations, and was effectively facilitated for movements through the bulk handling pathway, which utilises the National Grower Registration (NGR) system. Outside of this pathway, the large variety of risk vector movements, collection of appropriate information at the farm level and a lack of a national grain farm register (as opposed to the bulk handling-specific NGR) were highlighted issues.
2. Time and resource requirements for sampling grain from on-farm storage vessels as part of an effective **surveillance** program was identified as a limiting factor for emergency response operations. Potential alternative sampling approaches were identified that could improve surveillance efficiency through grower collected representative samples or bulk handling receival sites.
3. There is **diagnostic** capability for Karnal bunt in Australia, however the capacity to meet the expected volume requirements of an emergency response is limited by the current sample processing equipment and protocol, and lack of reliable high throughput test.
4. National **resource** sharing will be required to meet operational needs of the lead agency in a Karnal bunt response, together with effective **liaison** between key stakeholder groups.
5. **Movement conditions** can be put in place that would be effective in limiting Karnal bunt spread, however there are outstanding questions around their implementation. Conversely, there are potential implications on animal welfare resulting from the subsequent movement restrictions on grain for animal feed.
6. The provision of rapid, clear and proactive **public information** early in a Karnal bunt response was reinforced, with social media highlighted as a significant opportunity, but a risk that warrants further investigation.

Twenty-six recommendations were developed to address the outcomes and findings identified through the Exercise Haryana activities. The recommendations are aligned to the six key areas and are presented throughout the report.

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Overview

Background

Karnal bunt (caused by the fungus *Tilletia indica*) is a high priority pest of the Australian grains industry¹, due to the reduced quality of infected wheat grains and its serious potential impact on international grain trade. The Australian grains industry, stakeholders and governments, have been proactive in preparing for Karnal bunt, including through the development of an endorsed National Diagnostic Protocol², a threat-specific contingency plan³, and a range of awareness material³. The Grains Farm Biosecurity Program⁴ extends the preparedness activities throughout the industry and directly to growers through the employment of Grains Biosecurity Officers.

The need for Exercise Haryana was identified as an outcome of the Karnal bunt response planning project undertaken in South Australia in 2014, and the discussions of the National Karnal Bunt Preparedness Working Group, formed by the Plant Health Committee. Testing the preparedness for Karnal bunt was acknowledged as an important priority, with Grain Producers Australia providing the funding, and other industry and government stakeholders providing significant in-kind support, for the exercise.

The Exercise Haryana name was in recognition of the first report of the disease in 1931, where it was infecting wheat growing near the city of Karnal, in the Indian state of Haryana.

Exercise aim, objectives and program structure

The agreed aim and objectives (Table 1) were addressed through the delivery of a program of activities across 2015-16 (Table 2). No individual activity was designed to address all objectives.

Table 1. Exercise aim and objectives

Aim	Improve the ability to implement a rapid national response to a Karnal bunt detection in Australia
Objectives	<ol style="list-style-type: none"> 1. Achieve a national position on movement controls, mobilisation of resources and surveillance activities to be implemented rapidly following a Karnal bunt detection 2. Investigate the approach to achieve national delimitation of a Karnal bunt Incident for the purposes of the feasibility of eradication and market access 3. Determine the ability to trace risk movements of grain in a Karnal bunt response 4. Determine the strategy for communicating with stakeholders to support early response activities to a Karnal bunt Incident

The breakdown in the delivery of activities enabled greater targeting to attendees with appropriate skills to reach the desired outcomes. This approach also utilised a variety of exercise approaches allowing greater depth in the outcomes generated.

¹ As identified in the Grains Industry Biosecurity Plan version 3

² Available on the National Plant Biosecurity Diagnostic Network website (www.plantbiosecuritydiagnostics.net.au)

³ Available on the PHA website (www.planthealthaustralia.com.au)

⁴ www.planthealthaustralia.com.au/national-programs/grains-farm-biosecurity-program

Table 2. Summary of the Exercise Haryana program of activities

Phase	Activities	Approach	Major elements
Public information⁵ August 2015	Public information activity	Discussion exercise and workshop	<ul style="list-style-type: none"> • Development of a communications strategy • Communication resource analysis • Development of communications and social media material
National delimitation March-June 2016	Australian Government – International grain market impacts	Desktop exercise	<ul style="list-style-type: none"> • Determination of international grain export shipments potentially impacted • International market impact assessment
	New South Wales – Diagnostic capacity analysis	Desktop exercise	<ul style="list-style-type: none"> • Determination of the diagnostic process for suspect Karnal bunt in NSW laboratories
	South Australia – Bulk handler tracing	Discussion exercise	<ul style="list-style-type: none"> • Interrogation of bulk handler ICT systems to support trace-back outcomes
	Victoria – Incident management	Discussion exercise	<ul style="list-style-type: none"> • Preparation of an operations plan • Generation of a situation update
	Victoria – On-farm sampling and tracing	Functional exercise	<ul style="list-style-type: none"> • Tracing interviews from on-farm sources • Collection of surveillance samples from on-farm grain storage
	Western Australia – Response coordination	Discussion exercise	<ul style="list-style-type: none"> • Mapping and local movement restriction determination • Development of surveillance and sampling plan • Preparation of an operations plan • Development of a diagnostic delivery plan • Development of a WA specific communications plan
Decision making on movement conditions August-October 2016	Decision making and communications workshop	Workshop	<ul style="list-style-type: none"> • Significant observations relating to decision making and public information from recent incursions impacting the grains industry • Application of observations to Karnal bunt preparedness
	Movement conditions activity	Discussion exercise	<ul style="list-style-type: none"> • Special meeting of the Subcommittee on Domestic Quarantine and Market Access (SDQMA) to determine interstate movement conditions



On-farm sampling and tracing activity (Victoria): Farm gate sign displayed during functional surveillance activities.

⁵ Activity report available at www.planthealthaustralia.com.au/simulation-exercises

Participating organisations

Across the program of exercise activities, a broad range of organisations participated in Exercise Haryana (Table 3).

Table 3. List of organisations participating in the Exercise Haryana activities

Organisation type	Participating organisations
Plant production and associated industries	CBH Group Grain Producers Australia Grain Producers South Australia GrainCorp Grains and Research Development Corporation Viterra Glencore
Animal production and associated industries	Australian Chicken Meat Council Australian Egg Corporation Australian Pork Stock Feed Manufacturers' Council of Australia
Governments	Australian Government Department of Agriculture and Water Resources Department of Agriculture and Food, Western Australia New South Wales Department of Primary Industries Northern Territory Department of Primary Industries and Resources Primary Industries and Regions, South Australia Queensland Department of Agriculture and Fisheries Tasmanian Department of Primary Industries, Parks, Water and Environment Victorian Department of Economic Development, Jobs, Transport and Resources
Other	Animal Health Australia Plant Health Australia



Public information activity (national): Representatives from governments, the grains industry (production, handling and processing aspects) and livestock production industries come together to discuss communicating to their stakeholders in a response.

Exercise planning and evaluation

The Exercise Haryana program was led by PHA, with significant input from the Exercise Planning Committee, which included representatives from the Australian Government, the South Australian, Western Australian, Victorian and New South Wales state governments, Grain Producers Australia, Glencore-Viterra and the Grains Industry Market Access Forum. Through the Exercise Planning Committee, the national Exercise Haryana outcomes, schedule of activities and scenario were developed and agreed.

Detailed planning and delivery for the *public information and decision making on movement conditions* activities was the responsibility of PHA, with *national delimitation* activities (Table 2) the responsibility of the lead organisation. Evaluation requirements for each activity were determined on a case-by-case basis, and evaluation outcomes assembled for the exercise program by PHA.

Implementation of recommendations identified from the exercise will require coordination of the grains industry, government agencies and other stakeholders, which will be undertaken as a subsequent project.

Exercise scenario

All exercise activities were based around the simulated detection of Karnal bunt in a single cell (silo) of a bulk handling receival point in Kimba, South Australia. Trace-back from this cell identified 16 growers delivering into this cell, with the wheat sourced from a total of 19 properties all within 50 km of the Infected Premises (the bulk handling facility).

Further response details were provided for exercise activities, as required to achieve the activity objectives. This included trace forward to other grain producing jurisdictions through a seed distribution company, additional detections of Karnal bunt within the region and operational impacts on local intensive livestock facilities.



On-farm sampling and tracing activity (Victoria): Working under the scenario conditions required field teams to practice full hygiene and decontamination procedures.

Outcomes identified from exercise activities

The information presented in this section sets out the national findings from Exercise Haryana, taking into consideration outcomes from each individual activity. Observations and outcomes presented were identified through facilitator/evaluator observations, participant feedback, debriefs and analysis of outputs. Information is presented under six key themes:

1. Tracing
2. Surveillance
3. Diagnostics
4. Resources and liaison
5. Movement conditions and pest spread
6. Public information

Information presented under each theme emphasises the key observations and findings. Recommendations to address gaps identified are also presented under each theme. Additional information is available where individual activity reports have been released or from PHA (see page 2 for contact details).

Tracing

- The National Grower Register (NGR), a registration system delivered by eastern/central Australian bulk handlers, effectively supported tracing outcomes and generated a rapid picture of grain producer distribution. A comparable system is used in Western Australia.
- The fundamental limitations of using the NGR for tracing were that:
 - not all growers deliver to the bulk handler, and consequently do not have an NGR number
 - producers can operate multiple properties under a single NGR number
 - producers may use a city-based address (where they live)
 - some information included was out of date, and
 - the address details recorded were that of the payee, which was not always the same as the source address of the grain delivered.
- No official or comprehensive grain grower or farm register exists outside of the NGR (which is limited to suppliers of the bulk handling system).
- Bulk handlers collect, store and manage large volumes of information that readily supported the completion of trace forward and back of the grain in their system.
- Tracing outcomes in a Karnal bunt response would be highly reliant on bulk handlers' data, which was accessible and beneficial, but was not comprehensive for risk vector movements. For example, the movement of transport vessels or straw would not be captured.
- Data contained within the NGR and other databases linked to the grains industry needed to be reformatted or restructured before it could be transferred into response operational information systems.
- Karnal bunt tracing questionnaire forms for bulk handlers and on-farm grain movement were developed and tested through the exercise, although the completion of tracing interviews utilising these forms requiring substantial time commitments (i.e. hours), which would impact the speed of the response.
- Value of on-farm tracing outcomes was highly-dependant on the varying quality of grower records.

- The nature of the grains industry, with significant levels of risk vector (e.g. harvesters, trucks, agronomists, etc.) movements and informal trading of grain, sometimes over large (i.e. interstate) distances, complicates the completion of tracing.

Recommendation 1. Investigate the potential of NGR to include grain source (i.e. property) location

Recommendation 2. Investigate a national property registration system for the grains industry

Recommendation 3. Determine the minimum data required to complete effective tracing, leading to the reduction in the tracing form detail and time to complete

Recommendation 4. Develop effective mechanisms to allow direct import of bulk handler information system exports into jurisdictional surveillance platforms for use in emergency responses

Surveillance

- Two major limiting factors to deliver a surveillance program were identified; the time required to collect grain from storage vessels and diagnostic testing capacity.
- Field surveillance staff unfamiliar with grain industry operations had some difficulty in the interpretation of the sampling requirements and methodology described in the Karnal bunt contingency plan.
- Sampling from on-farm storage vessels is completed through outturn of the entire volume of grain, requiring the utilisation of the growers' equipment, including a grain belt conveyer and receival vessel (likely to be a truck). This potentially leads to issues around equipment availability and personnel safety.
- Sampling from on-farm storage vessels is time intensive, estimated at approximately two hours per vessel from the collection of the first subsample, and results in a large (approximately 50 kg) grain sample per vessel (depending on vessel size). Most farms have multiple storage vessels onsite.
- Representative grain samples for each on-farm storage vessel are collected at harvest by a proportion of growers and stored for the purposes of quality testing and verification, which provide opportunities for use in surveillance programs.
- Limited accessible formal Karnal bunt surveillance program data, together with the cryptic nature of symptoms in crop, and the likely delay in initial pest detection, results in inadequate area freedom evidence to support market access and movement condition decision making.
- Response operation guidance and decision making support was limited without agreed and available national surveillance and sampling plans for Karnal bunt.
- Deliveries containing bunted grain are rejected at bulk handling receival sites, but destination of this grain is not subsequently monitored as normal business practice.
- Some bulk handling companies proactively assist growers to correct on-farm quality issues following rejection of grain delivery at receival sites.
- Receival personnel at bulk handling sites are not specifically trained to recognise Karnal bunt symptoms, and there are no known documented company procedures for sending suspect samples for identification.

- Recommendation 5. Determine the statistical rigour of using grower generated representative grain samples as a basis for delimiting or area freedom surveillance**
- Recommendation 6. Investigate the confidence level for the detection of Karnal bunt using the sampling methodology in the Karnal bunt contingency plan, and compare this to alternative sampling methods and reduced sampling rates that are less resource intensive. The confidence levels should be measured for an individual farm and surveillance program wide**
- Recommendation 7. Develop a revised sampling protocol and broader surveillance strategy, based on the outcomes of Recommendation 6, that reduces the sampling requirements on farm while achieving appropriate statistical rigour for delimitation and area freedom determination**
- Recommendation 8. Review general surveillance data generated from the grain handling pathway to determine the value to claim Karnal bunt area freedom**
- Recommendation 9. Develop nationally endorsed surveillance plans for Karnal bunt that could be used for delimitation and area freedom determination**
- Recommendation 10. Review the Karnal bunt contingency plan with specific reference to providing clearer direction to field teams on the sampling protocols from grain storage vessels**
- Recommendation 11. Implement a surveillance program to collect Karnal bunt absence data**



Response coordination activity (WA): Responding to even a single trace forward of potentially infected wheat seed requires a coordinated effort.

Diagnostics

- Diagnostic capability for Karnal bunt identification through molecular and morphological approaches is available nationally, but not entirely within a single jurisdiction.
- Sample processing using the current diagnostic protocol is a limiting factor in diagnostic capacity, and requires the use of specialist equipment (sieves) that cannot be purchased from commercial sources and need to be produced in house.
- Morphological identification of the Karnal bunt spores, as per the current diagnostic protocol, is time consuming and likely to be the critical limiting factor in delivering rapid diagnostics.
- Capacity is the significant issue for the delivery of Karnal bunt diagnostics, for both molecular and morphological techniques, with current approaches limited to processing tens of samples per day per laboratory.
- There is no ongoing training in Karnal bunt identification for diagnosticians, or quality control program in place, to ensure diagnostic preparedness levels in Australia.

Recommendation 12. Develop high throughput sample processing methodology to support the delivery of accurate and timely Karnal bunt identification techniques

Recommendation 13. Develop a robust and rapid identification test for Karnal bunt

Recommendation 14. Build capacity through the delivery of a Karnal bunt identification training program for diagnosticians, supported by an ongoing testing of proficiency

Resources and liaison

- The required level of resource allocation to achieve appropriate surveillance, tracing, diagnostics and response management outcomes for a Karnal bunt response is likely to exceed expectations based on experience with other plant pest responses.
- The ability to conduct effective response operations for Karnal bunt is likely to require national resource sharing to complement gaps in each jurisdictions capability or capacity.
- Engagement of informed industry representatives (covering grain production, grain handling and other relevant areas) during response operational planning improved the effectiveness of the response actions.
- Collaboration with bulk handlers during this exercise built strong relationships and developed a greater combined understanding of delivering a Karnal bunt response.

Recommendation 15. Reach endorsement for national policy, and the underpinning implementation mechanisms, to achieve appropriate and effective sharing of human resources to facilitate the delivery of intensive plant pest responses

Movement conditions and pest spread

- Interstate regulators have confidence that the spread of Karnal bunt from a localised infected area to elsewhere in the country can be prevented through the implementation of available and appropriate movement conditions and the mechanisms to enforce these conditions are feasible.
- The agreed conditions implemented by the Lead Agency in the exercise activities provided confidence to other jurisdictions that the pest would be contained within the Restricted Area. Given the likely time lapse from establishment to detection, these processes would contribute to the successful tracing of the pest.
- Requirements to implement the agreed movement conditions varies between jurisdictions, ranging from operational decisions through to requiring changes to regulations, resulting in diverse timeframes for implementation.
- The ability to decontaminate risk vectors, including host grain, soil, silos and complex machinery, remains a significant risk to Karnal bunt eradication operations and policy development.
- Fumigation was identified as likely to be the only potential option for decontaminating complex machinery, but significant questions remain about its effectiveness, and the ability to manage the logistics of deployment broadly to support movement condition requirements.
- Rolling stock and other transport vessels may present a large risk in spreading Karnal bunt, requiring further investigation.
- Grain dust cleaned from certain bulk handling facilities is transported and spread onto grain producing properties to enrich the soil, creating a high-risk pathway for pest distribution.
- Animal welfare considerations were a noteworthy driver in the decision-making process, primarily regarding limiting Karnal bunt movement risks through decontamination during stockfeed manufacture and transport of livestock recently fed infected grain.
- Strong intent to regulate livestock movement to reduce the risk of Karnal bunt spread, but the details of how this can be achieved due to an Emergency Plant Pest response, rather than an Emergency Animal Disease, is unclear in some jurisdictions.
- Where animal welfare impacts cannot be mitigated, movement of livestock for processing is likely to be allowed under permit and appropriate conditions.
- Considerations of the SDQMA regarding risk vector movement conditions were improved through the provision of a detailed formal request (simulated) from the Consultative Committee on Emergency Plant Pests.

- Recommendation 16.** Investigate available treatment options for use in stockfeed manufacture that are effective in removing Karnal bunt spread risks
- Recommendation 17.** Research the feasibility of decontaminating complex equipment for Karnal bunt
- Recommendation 18.** Research the risks of Karnal bunt spread from rolling stock and other transport vessels
- Recommendation 19.** Investigate the underpinning requirements in state/territory legislation for the regulation of animal movement during an Emergency Plant Pest response
- Recommendation 20.** Work with bulk handlers to implement an alternative disposal approach for grain dust that does not pose a Karnal bunt spread risk
- Recommendation 21.** Develop templates for technical requests from CCEPP to SDQMA, and for the subsequent responses from SDQMA, to guide appropriate information provision
- Recommendation 22.** Details of local movement conditions implemented by the Lead Agency to be included in all relevant technical requests for interstate movement condition reviews to SDQMA



Decision making and communications workshop (national): Applying observations from recent grains pest responses to the Karnal bunt exercise scenario.

Public information

- The development of communications materials to support Karnal bunt simulated response operations demonstrated difficulties in complying with confidentiality, with information not included in Talking Points incorporated into the material.
- Available supporting resources (e.g. fact sheets and websites) are appropriate for communications to grain producers and their support services, grain processors and animal industries dependent on grain for feed, but did not contain the required messages for other audiences, such as the supply chain (movement and storage) or international markets.
- While supporting resources often provided good information on Karnal bunt, they were often not appropriate to support communications activities due to their format, level of detail or focus.
- The rapid timeframes for information distribution through social media, primarily from non-official sources, poses a risk to response operations that was not fully appreciated by many stakeholders.
- Exposure to the use of social media platforms as an information distribution mechanism emphasised the need for further analysis and practice, including an exploration of appropriate roles, responsibilities and resource allocation that may be necessary in this area.
- Social media cannot be controlled during a response, therefore effective management of a Karnal bunt response requires a proactive approach of information release and the ability to react in a flexible manner through engagement of appropriate expertise.
- Proactive Karnal bunt response communication approaches are essential to ensure accurate information dissemination, mitigating rumours in the industry and minimising market impacts.

Recommendation 23. Develop a proactive communications plan that includes predeveloped holding messages and material templates to support the delivery of communications outcomes rapidly following a Karnal bunt detection

Recommendation 24. Develop material to support communication messages to the grain supply chain and international markets in relation to Karnal bunt

Recommendation 25. Ensure social media utilisation and management expertise is available to all jurisdictions

Recommendation 26. Ensure social media considerations are included in public information planning documents and strategies relating to Karnal bunt



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