



PLANT RESOURCE BIOSECURITY RESPONSE GUIDELINES
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I. INTRODUCTION

This document is intended to serve as a guide when a new plant pest is detected in Kansas. Many components of the traditional approach to plant pest control by a number of public and private organizations are incorporated into this document.

However, the realization that intentional introductions of plant pests by persons wishing to cause economic or environmental harm to Kansas natural and cultivated plant resources has added another dimension to the need to protect those resources and emphasizes the need to develop rapid response capabilities.

For the purpose of this document the term “rapid response” is defined to mean a series of coordinated activities involving one or more organizations that are initiated by the discovery of a plant pest of concern.

Rapid response activities consist of a number of components including detection, accurate identification and/or diagnostics, and mitigation activities.

It is unlikely that any single agency or organization has both the legal authority and a sufficient level of resources to conduct an effective plant pest mitigation response without the involvement and support of others.

It is important for all involved to clearly understand their roles and responsibilities in a rapid response situation.

Generally, a state or federal plant pest regulatory agency will have to be the lead agency in conducting any response activity because of the legal responsibilities assigned to that agency.

Accurate and timely plant pest identification and/or diagnostic support is critical to developing and implementing effective mitigation activities. Therefore, it will be especially important for agencies that have skills in this area be included in the planning and implementation of mitigation activities.

Organizations with plant pest identification and/or diagnostic capabilities may be one of the first to receive samples or initial indication of a potential problem. It is essential that this information be provided to regulatory agencies as soon as possible so that effective evaluation and mitigation activities can be initiated.

II. PURPOSE

The purpose of this document is to:

- Outline an effective rapid response to the detection, identification, and mitigation of new plant pests. Rapid response actions may include, but are not limited to, focused delimiting survey activities, specific control activities, quarantine, eradication, public outreach and education, and inter-agency communication and coordination.
- Provide effective and timely communication between local, regional, state and federal government agencies, academia, and plant industry professionals when response actions are needed.
- Provide effective public notification of response activities.

III. LEGAL AUTHORITY

All actions implemented are authorized by and conducted in accordance with provisions of the following:

- State Authority
 - Kansas Plant Pest and Agriculture Commodity Certification Act (K.S.A. 2-2112 et seq.) and supporting regulations (K.A.R. 4-15-4 through 4-15-14).
 - Kansas Black Stem Rust Act (K.S.A. 2-712 et seq.).
 - Kansas Criminal Code: K.S.A. 21-3419, K.S.A. 21-3436, K.S.A. 21-4221, and K.S.A. 21-4222.
 - Emergency Preparedness for Disasters: K.S.A. 48-924.
- Federal Authority
 - Agriculture Bioterrorism Protection Act of 2002 (Public Law 107-188).
 - Plant Protection Act of 2000 (Public Law 106-224, June 20, 2000).
 - Federal Plant Protection Regulations (7CFR 300-399).
- Other Agreements
 - KDA/USDA-APHIS-PPQ Cooperative Pest Control Memorandum of Understanding.

IV. ROLES AND RESPONSIBILITIES

A. Kansas Department of Agriculture. The Kansas Department of Agriculture (KDA), through its Plant Protection and Weed Control Program, is the lead state agency to minimize the introduction and dissemination of plant pests into and within Kansas and to provide a regulatory response to new plant pest introductions. This program's goal and objectives relating to plant pests are listed below.

PROGRAM GOAL: The goal of this program is to ensure the health and protection of the state's natural and cultivated plant resources from arthropods, plant diseases, and weeds. This is accomplished through assigned responsibilities contained in the Kansas Plant Pest and Agriculture Commodity Certification Act, Kansas Black Stem Rust Law, Kansas Noxious Weed Law, and several federal agreements and memoranda of understanding.

OBJECTIVE #1: SAFEGUARDING. Provide a system to protect Kansas plant resources from the entry and establishment of high-risk exotic plant pests. Detecting and excluding exotic plant pests of regulatory significance will protect native and cultivated plant resources and maintain the ability to export Kansas-produced plants and plant products.

OBJECTIVE #2. EXPORT COMMODITY ASSURANCE. Provide a system to ensure that the pest freedom requirements placed on Kansas-produced commodities by domestic and foreign importers is maintained to allow expeditious movement of those commodities.

OBJECTIVE #3. PLANT PEST MANAGEMENT, CONTROL AND ERADICATION. Provide the capability to manage, control, or eradicate selected plant pests of regulatory significance that are established in the state and provide technical expertise to program cooperators involved in pest control.

Specific activities to accomplish the objectives stated above include, but are not limited to, the following:

- Conduct detection surveys for exotic plant pests.
- Conduct investigations on reported and/or suspect new detections.
- Communicate and coordinate activities with appropriate local, state, and federal agencies, academia, industry, and other appropriate organizations as related to program responsibilities.
- Confirm identification or provide specimen to appropriate taxonomic authority for identification.
- Inform the public of new plant pest detections or threats.
- Coordinate communication of new plant pest information with the United States Department of Agriculture, Animal and Plant Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ), other appropriate state and federal agencies, state academic institutions, and industries.
- Implement and maintain appropriate state quarantines.
- Coordinate activities with USDA-APHIS-PPQ on cooperative programs.
- Review and coordinate control activities to ensure compliance with local, state, and federal laws.

B. USDA-APHIS-PPQ. USDA-APHIS-PPQ is the lead Federal agency that regulates plant pests in the United States. Some federal activities include the following:

- In cooperation with the Department of Homeland Security, examine high-risk cargo shipments for exotic plant pests at ports of entry.
- Implement federal emergency response measures to prevent dissemination of exotic plant pests when discovered.
- Provide identification services.
- Provide funding for plant pest survey and detection, monitoring, and outreach functions.
- Assist other agencies as needed in the detection, evaluation, monitoring, and eradication, of new exotic plant pest introductions.
- Create increased awareness of exotic and/or invasive plant pests through information and education.
- Transfer technology to cooperators.
- Improve management of selected exotic plant pests through development of new technology.
- Provide assistance to states for the control of exotic plant pests that may become established including development of National Environmental Policy Act of 1969 documentation, project planning, and other technical support.

C. Kansas State University Research and Extension. As the land-grant institution in Kansas, Kansas State University (KSU) has a long history of conducting research and extension programs to assist in efficient agricultural commodity production. As part of the National Plant Pest and Disease Diagnostic Network, KSU has been selected as one of five regional centers in the United States to develop distance diagnostic capabilities and will operate the Great Plains Diagnostic Network. This capability will be an integral part of any rapid response effort in Kansas.

The U.S. Department of Agriculture is creating a National Plant Pest and Disease Diagnostic Network (NPPDDN) made up of experts from the nation's land-grant universities. The network will provide a cohesive distribution system to quickly detect pests and pathogens that have been deliberately introduced into agricultural and natural ecosystems, identify them, and report them to appropriate responders and decision makers.

The Great Plains Diagnostic Network is developing a web-based plant pest diagnostic and reporting system, which will help land-grant personnel submit plant samples, digital images, and detailed crop information for pest diagnosis. Advantages of this system include:

- Rapid evaluation and reporting of potential bioterrorist threats.
- Shorter response time for diagnosis.
- Established links among diagnostic labs in the GPDN and to other labs in the NPPDDN.
- Established links to regulatory agencies (including the USDA's Animal and Plant Health Inspection Service and each state's Department of Agriculture).
- Better quality and uniformity of information associated with samples.
- Better record keeping and reporting of pest outbreaks.

The Plant Diagnostics Information System (PDIS) has been developed to facilitate plant diagnostic lab activities for a consortium of land grant institutions, state departments of agriculture and the U.S. Department of Agriculture. These labs provide services for plant disease diagnosis, plant identification, and insect identification. PDIS is a system of web

and database applications designed to facilitate recordkeeping and communication needs of lab personnel and their customers.

D. Kansas Biological Survey. The Kansas Biological Survey is a non-regulatory, non-degree granting research and service unit of the University of Kansas and the State of Kansas. Its programs and activities focus on environmental and biological issues at state, regional, national, and global levels.

E. Response Activities by Others. Due to the fact that many cooperating agencies have differing responsibilities, the KDA and/or USDA-APHIS-PPQ will be the lead agencies in conducting any regulatory response actions in Kansas. Other organizations may assist the lead agencies in many unique and beneficial ways, but they should not implement unilateral actions on their own as these actions may hinder official regulatory response activities. It is important for all agencies involved to remain in close communication during a rapid response so that the appropriate actions may be identified and delivered in the most effective manner possible.

V. RAPID RESPONSE OVERVIEW

When a new plant pest is detected in Kansas, the KDA will initiate an investigation of the detection and obtain specimens for identification or ensure specimens have been submitted to an expert for identification and/or confirmation.

Depending on the type of plant pest that is detected, an appropriate discipline advisory team will be activated to review the information and circumstances pertaining to the discovery. Three discipline advisory teams will be organized prior to any discovery so they can be activated as soon after discovery as possible. They are the Entomology Advisory Team, the Plant Pathology Advisory Team, and the Weed Advisory Team. Suggested members of each discipline team are as follows:

Entomology:	KDA Plant Protection and Weed Control Program Manager, team leader KDA Survey Entomologist KSU Entomology Department head or designee Extension entomology state leader Extension entomology diagnostician Affected industry representative (to be identified following discovery)
Plant Pathology:	KDA Plant Protection and Weed Control Program Manager, team leader KDA Plant Pathologist KSU Plant Pathology Department head or designee Extension plant pathology state leader Extension plant pathology diagnostician Affected industry representative (to be identified following discovery)
Weed:	KDA Plant Protection and Weed Control Program Manager, team leader KDA weed specialist KSU Agronomy Department head or designee Extension agronomy state leader Extension agronomy diagnostician KU Biological Survey representative Affected industry representative (to be identified following discovery)

Concurrent with the activation of the appropriate discipline advisory team, the Policy Team (described below) is notified.

The discipline advisory team will convene to evaluate preliminary information of the circumstances of the discovery and prepare a preliminary status evaluation report containing potential mitigation actions. Generally, response actions will be one or more of the following:

- no response
- non-regulatory response
- regulatory response
- law enforcement response

The preliminary status evaluation report is forwarded to the Policy Team described below for consideration. If the preliminary investigation indicates that an intentional act to cause harm may have occurred, the appropriate law enforcement officials are notified immediately and invited to participate on the Policy Team. The Policy Team will decide upon the appropriate response to the new plant pest detection.

Following the evaluation by the appropriate discipline advisory team, three action teams, a policy team, a response team, and a public information team will be convened as discussed below.

In the event that a decision is made to provide a non-regulatory response, the development of pest management strategies and/or best management practices could be developed by those usually responsible for these including, but not limited to, industry and research and extension.

A. POLICY TEAM. The Policy Team will identify and allocate the appropriate resources, review and approve a response plan, assign actions to be undertaken by a designated project leader, resolve issues not easily addressed by any individual on the Policy Team, and identify a public information team.

The Policy Team will consist of:

Kansas Secretary of Agriculture

KDA Chief Counsel

Plant Protection and Weed Control Program Manager

USDA-APHIS-PPQ State Plant Health Director

Associate Director, Research, Kansas State University Research and Extension

Associate Director, Extension, Kansas State University Research and Extension

KDA Public Information Officer

Others as appropriate (to be determined by the Kansas Secretary of Agriculture)

The Policy Team will appoint a KDA Project Leader to coordinate efforts within the Response Team and, in consultation with the Policy Team, provide direction to the response effort. The Project Leader is directly responsible to the Policy Team.

B. RESPONSE TEAM. The Response Team will develop and implement technical aspects of mitigating a new plant pest detection including, but not limited to, gathering and analyzing data, supporting or conducting investigations, and managing all state aspects of investigative and response functions.

Response Team members are:

KDA Plant Protection and Weed Control Program Manager

Appropriate KDA Plant Protection and Weed Control Program state specialist

USDA-APHIS-PPQ State Plant Health Director

Appropriate academic institution specialist(s)

KDA Public Information Officer

Others as needed

The Response Team, under the direction of the KDA Project Leader and appropriate KDA state specialist, will organize work force activities and other resources. Work force organization will reflect the needs of the event including staff assignments for operations and coordinating with the appropriate KDA staff responsible for finance, logistics, communications, records, and other needs.

The Response Team will also be responsible for arranging for diagnostic support that may be needed during response activities.

Issues that cannot be resolved within the Response Team will be referred to the Policy Team for discussion and resolution.

C. Public information Team. The Public information Team will develop and issue press releases, response advisories, and manage media and public relations.

Public Information Team members are:

KDA Public Information Officer

KDA Plant Protection and Weed Control Program Manager

Others as determined by the Policy Team, including, but not limited to industry and extension communications specialists

If USDA-APHIS-PPQ is involved in the response, KDA will work with the USDA-APHIS-PPQ State Plant Health Director to ensure public information releases are coordinated with the USDA-APHIS-PPQ Legislative & Public Affairs (LPA) office.

Press conferences will be held when determined appropriate by the Policy Team.

The Public Information Team will work with the Response Team to keep the Kansas Secretary of Agriculture informed of all activities.

The Public Information Team will provide assistance with drafting press release(s) for cooperating agencies, institutions, and affected industry.

The Public Information Team will coordinate activities with technical experts to ensure their availability to assist in press briefings when needed.

If other state agencies, including academic institutions, are involved in response activities each agency and/or institution will chose their own spokesperson. As far as possible, when a spokesperson is chosen, that person will serve in that capacity throughout the entire response event in order to provide continuity of information.

VI. RESPONSE IMPLEMENTATION

A. In the event of a new plant pest detection by an organization other than KDA that agency will notify the KDA who will activate the appropriate disciplinary advisory team.

B. The appropriate discipline team will evaluate the situation and determine appropriate mitigation actions.

C. If a new plant pest detection is confirmed in Kansas that requires the resources and expertise of other agencies, departments, universities, or other specialists, the Kansas Secretary of Agriculture or their designee from the Policy Team will confer with the appropriate agency head or designated representative. Once the decision is made to initiate a regulatory response, the Kansas Secretary of Agriculture or their designee will notify the necessary team members.

1. KDA staff will follow established procedures for intra-department communication. The Plant Protection and Weed Control Program Manager will have lead responsibility for notifying and mobilizing KDA staff and ensuring proper communication with the USDA-APHIS-PPQ Kansas State Plant Health Director.

2. KDA will identify and assign support staff sufficient to manage communication, logistical, and documentation needs.

3. Once activated, the Response Team will:

a. Determine the appropriate response activities. Examples include:

1). Conducting intensive core survey and delimiting survey.

2). Investigating the method and/or pathway of new plant pest introduction. If an intentional introduction is suspected, the appropriate law enforcement agency will be notified and advised of the situation.

- 3). Assess the risk of plant pest spread from the initial detection site.
- 4). Assess the potential for harm to host species.
 - b. Notify the Policy Team of the need to obtain and/or mobilize additional resources such as public information officer, other agencies, academic institutions, and laboratory or field/technical staff as necessary.
 - c. Ensure appropriate diagnostic support is available.
 - d. Ensure coordinated communication between field sites, the KDA Topeka office, and other agencies and organizations involved in the response.

VII. RESPONSE TASK SUMMARY

A. KDA staff:

1. Provide communications staff to prepare and issue press releases, coordinate press conferences, and deal with other communication activities.
2. Advise Policy Team and other agencies and organizations advised of response activity status.
3. Analyze submitted/collected samples of new plant pest for positive identification or verification in conjunction with USDA-APHIS-PPQ.
4. Be part of the Policy Team and the Response Team.
5. Report and disseminate activity results internally and externally as required.
6. Coordinate activities of other cooperating agencies, institutions, and organizations.
7. Develop appropriate management/mitigation protocols for infested materials (i.e., treatment, quarantine, etc.).

B. Discipline Advisory Team:

1. Ensure new plant pest specimens are identified correctly.
2. Evaluate the circumstances surrounding the new plant pest discovery.
3. Identify potential mitigation actions.
4. Provide a preliminary evaluation report to the Policy Team.
5. Upon request of the Policy Team, develop a response plan and work with the Response Team to ensure technical aspects of the selected mitigation activities are properly developed and implemented.

C. The Policy Team:

1. Allocate resources and notify other agencies, institutions, and organizations as needed.
2. Activate the Response Team.
3. Assign specific actions to the Response Team through the Project Leader.
4. Resolve issues related to Response Team activities.
5. Activate the Public Information Team.
6. If needed, develop inter-agency financial agreements.

D. The Response Team:

1. Implement response activities.
2. Utilize the basic organizational structure for Federal/State emergency projects and ensure expertise of appropriate discipline advisory team is utilized effectively.
3. Coordinate field activities including inspections, investigations, and surveys.
4. Evaluate data collected during the response actions and use this data to adjust response actions.
5. Provide progress reports to the Policy Team and Public Information Team.
6. Notify the Policy Team of perceived resource needs.

E. The Public Information Team:

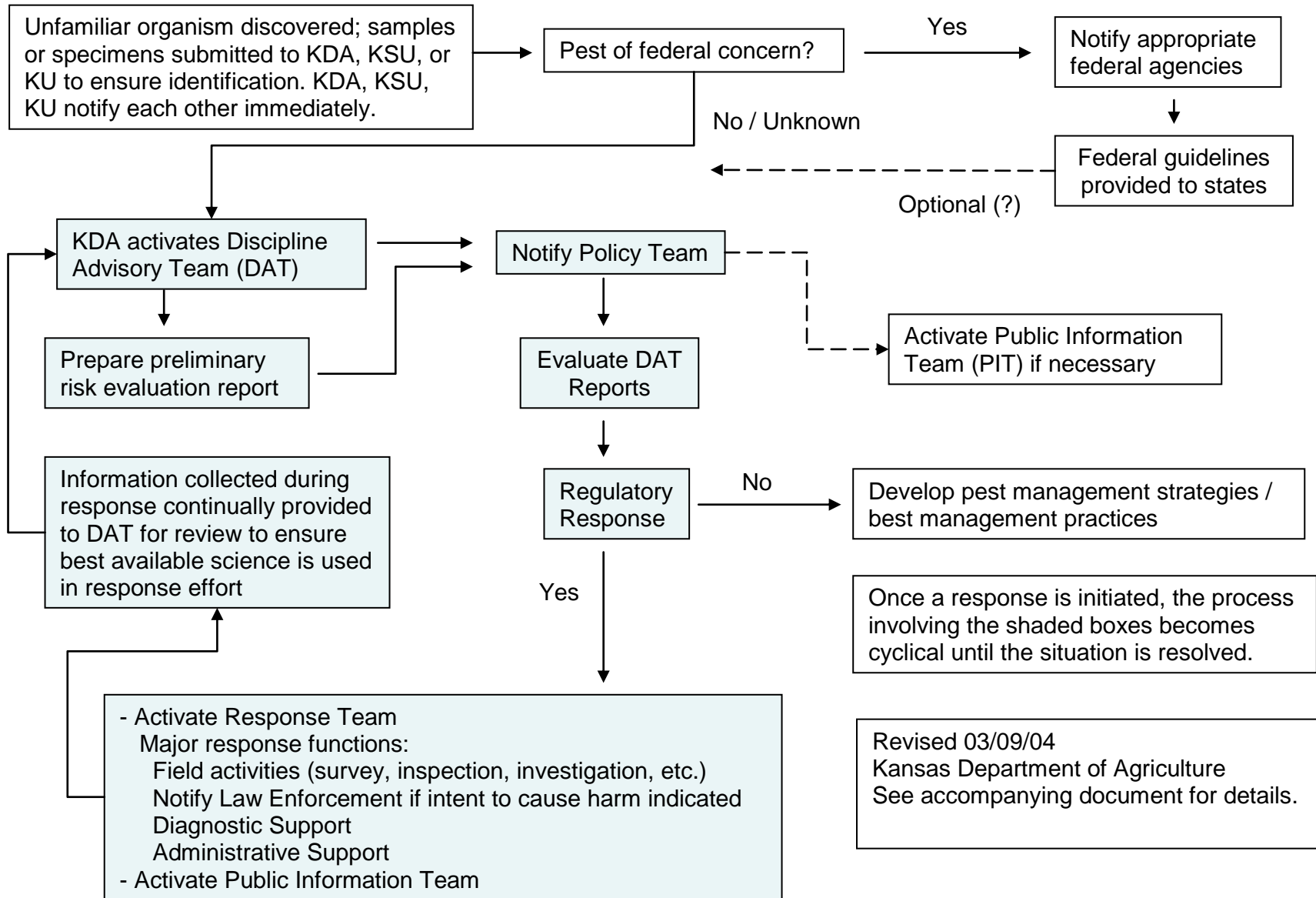
1. Develop and issue press releases.
2. Coordinate media contacts and information dispersal through industry, extension, and others as appropriate.
3. Arrange and conduct press conferences as needed.
4. Provide incident updates to the Policy Team.

VIII. DEFINITIONS

“Plant pest” means any stage of development of any insect, nematode, arachnid, or any other invertebrate animal, or any bacteria, fungus, virus, weed or any other parasitic plant or microorganism which can injure plants or plant products (K.S.A. 2-2113).

“Rapid response” means a series of coordinated activities involving one or more organizations that are initiated by the discovery of a plant pest of concern.

Kansas Plant Pest Response Flow Diagram



Appendix C

Plant Pest Identification and Taxonomic Resources

NOTE: This section is under development and is not complete. This section will eventually contain listings of in-state public and private sector taxonomic experts and their area of specialization under the general disciplines listed below.

Arthropods

KSU Entomology Department
KU Entomology Department
Kansas Department of Agriculture

Nematodes

KSU Plant Pathology Department

Plant Pathogens

KSU Plant Disease Diagnostic Clinic
Kansas Department of Agriculture

Weeds, Plants

KSU Herbarium
KSU Agronomy Department
KU Herbarium
Kansas Biological Survey
Kansas Department of Agriculture

Mollusks (?)

Attachment 1: Plant Disease Biosecurity and Invasive Species Guidelines
DRAFT

Introduction:

The following is information and guidelines to aid in addressing plant disease issues from either natural, non-intentional, or intentional introductions. It is a supplement to the Kansas Department of Agriculture Plant Resource Biosecurity Response Guidelines of 2004 (PRBRG) and intended to aid the Plant Pathology Advisory Team.

In this document a variety of issues are discussed in order to facilitate rapid response implementation as outlined in the PRBRG. Because of the large potential of new or invasive diseases in a variety of situations the approach is taken to address broad groups rather than individual disease, situations, or crops. First some general considerations or protocol are addressed and then specific topics of protocol are discussed for groups. At the end, a watch list (Appendix 2) is presented and considered to be open for each grouping and a needs list of items (Appendix 3) which should be considered to facilitate in addressing biosecurity issues regarding plant diseases.



General considerations:

What triggers action by the Plant Disease Advisory Team? There are basically two ways that trigger the alarm to address a situation with a plant disease. The first is the confirmation of a disease from the watch list. These diseases are usually exotic, have the ability to be invasive, and are of significant concern to the production and marketing of the crop/commodity or threaten a native or horticultural species. The watch list is open and subject to change.

The second way is for any disease not on the watch list but again is exotic or newly recognized and has a significant concern to a crop or a native or horticultural species.

It is very important that timely communication exists between first detectors, first identifiers, and government agencies. The Plant Disease Advisory Team depends on accurate and timely information to assess an incident in a successful manner.

In situations where the disease is on a horticultural plant in the nursery or greenhouse industries or seed infected, the commodity under the Plant Pest Law of the State of Kansas can be addressed by hold, destroy, or treat orders. This can be done at the discretion of the Kansas Department of Agriculture. The Plant Disease Advisory Group would not need to be convened if the situation was small in scale and quickly addressed in this manner.

How did the disease get here? Type of introductions can be of three types. The first type includes the natural spread by the organism in the form of wind, vectors, water, and other carriers as opposed to those facilitated by man. The other two types are those caused by man in a non-intentional indirect manner or in a direct or intentional manner which may be considered as a biological terrorist action. *Evaluation of the incident by the PDAT should consider the introduction pathway early in the investigation as this will influence how a response is designed and implemented.* In most cases, the introduction will be the result of natural or non-intentional introductions.

How do we know what we have? Confirmation is based on the most current science available. The Kansas Plant Pathology Advisory Team will generally want confirmation by either the Great Plains Diagnostic Laboratory housed at Kansas State University or by USDA-PPQ-APHIS identifiers. In some cases, results from samples sent to such laboratories as Agdia, Inc. in Elkhart, Indiana or to the Iowa Seed Testing Laboratory at ISU in Ames, Iowa will suffice.

A sample is considered official if it was collected by Kansas Department of Agriculture or USDA personnel and it was handled in a manner to maintain its official identity. In some cases, samples collected by KSU extension personnel in monitoring programs such as the Asian Soybean Rust Sentinel Plot Survey or the Kansas Pine Wilt Initiative will be considered official. Official samples are required for response initiatives to be enacted by the Plant Pathology Advisory Team. The use of disposable latex gloves and sampling cups or other utensils should be considered along with sanitation of any sampling tools in the specific protocol for a disease and given situation. All samples should be stored in some type of double containers and correctly labeled with permanent markers for sample identification number, host plant, date, and location.

The potential for false positives should be of highest concern in testing and confirming many diseases especially those where the crop is widely grown and exported.

What is the disease history in the state? Records from the Kansas Department of Agriculture Plant Protection Program, Great Plains Diagnostic Network, and those available from USDA sources will be used to ascertain the past and present status of the disease. Negative records or the absence of records if the plant or crop is common play a significant role along with any positive records in determining the history and potential for establishment in the state. Reports of disease from reputable outside sources can

Appendix C

also be considered. There are several sources of surveillance activities that are active in the state some of which are more formal than others. These activities include the Cooperative Agricultural Pest Survey (CAPS), Kansas Department of Agriculture Plant Protection Program's surveys and inspections, Asian Soybean Rust Sentinel Plot Survey by KSU Extension and informal observations and surveys by various personnel of the USDA-ARS located in Manhattan, Kansas Forest Service, KSU Plant Pathology and Agronomy Departments, and KSU Extension Manhattan Campus and other locations.

General and specific surveillance are necessary aspects of protecting Kansas agriculture. Long term continuance and good science are required for any surveillance program.

Quarantines, delimiting surveillance, general detection surveillance, and point of source investigations: Quarantines are legal instruments specifying a program to stop or restrict the movement of a pest and related articles for the purpose of stopping the spread of the pest. Delimiting surveillance or surveys are those which are designed to identify the presence and magnitude of a pest after it has become established in an area. A delimiting survey is generally conducted in a geographical zone around the original find in a systematic manner based on cropping and epidemiological factors. General detection surveillance or surveys are those activities which are designed to provide information on general endemic pests and to ascertain the presence or absence of those pests of exotic nature. Point of source investigations are usually in the form of trace forward and trace back and rely on records regarding the purchase or shipping of articles. These investigations are a form of surveillance in which the pest may have been moved with an article and information is sought which may enable mitigation or legal action to stop further spread of the disease. These are common with pests found in nursery or greenhouse stock.

The following are some groupings of plant diseases and related considerations and protocols. They are in no specific order.

Air borne rust and other diseases:

This disease grouping typically belongs to the genus *Puccinia*. They are pathogens of cereals crops primarily of wheat. New races of black stem rust, stripe rust, and leaf rust are of significant concern since much of the crop is tolerant or resistant to current races. In recent years, Asian soybean rust caused by *Phakopsora pachyrhizi* has been of significant interest and has been as close as Missouri and Arkansas in confirmed field observations. This group of diseases generally does not overwinter in the state and are dependent upon wind blown sources of infection from areas south of Kansas to spread the disease into the state. These diseases generally have the ability to produce rapidly abundant inoculum which can spread quickly and over long distances with prevailing winds. *It is possible that non intentional or intentional introductions could occur with this group and cause significant damage to a crop and also to the markets.*

Potentially there are diseases of trees, native plants, or horticultural crops which also experience rust epidemics and should not be overlooked. Sorghum ergot although not a rust disease has much the same epidemiology in terms of over wintering and being wind dispersed as the rust diseases and could be considered in this group.

General surveillance or first detection:

In Kansas, agronomic and horticultural crops are annually surveyed for rust diseases by Kansas Department of Agriculture, KSU Extension, and other related groups. If a new disease or one from the watch list is suspected then the Plant Advisory Group should be convened. The Plant Disease Advisory Team will meet, evaluate, and make recommendations to the Plant Disease Policy Team.

Quarantine and delimiting zones: Because these diseases are wind blown over great distances and generally the host material is also widespread, quarantines are not likely effective against these diseases.

Appendix C

Delimiting zones may be effective in understanding the distribution of the disease and enable protective mitigation measures in adjacent at-risk areas. Crop phenology should be carefully considered in planning and executing a delimiting survey. Delimiting surveys should consider a zone of about a twenty mile radius from the original find. The prevailing winds are also an important consideration to this type of survey. Care should be taken by personnel in conducting this survey as not to carry the disease to new areas. Clothing and foot gear should be changed or cleaned before entering new areas from areas where the disease was found. It is preferred that the survey would start on the outside of the delimiting zone and work toward the confirmed area when possible. Delimiting survey personnel should visit one field in about four fields or once every 2 miles in a direction toward the original find from the perimeter of surveillance zone. If the disease is then found, then survey should be completed to the original find and then in a circular fashion around the original find from the farthest known finds within the zone. Subsequent surveys in adjacent areas would then be based on results. Trace forward and trace back investigations generally would not have an application in determining where the disease of wind blown rusts had come from and where it was going. The exception to this would be something found in the nursery or greenhouse industry.

Confirmation protocol: Samples should be collected and kept in a sealed plastic bag and cooled. The samples of Asian soybean rust should be expedited to the Great Plains Diagnostic Laboratory at KSU for analysis and confirmation. Black stem rust may also need the same handling if exotic races are suspected. The USDA Cereal Rust Laboratory in St. Paul, Minnesota can be a source of confirmation especially for race investigations of leaf, stem, and stripe rusts of cereals.

Communication: The discovery of rust diseases or races currently present in the state or in the Great Plains Region could have a significant impact on the markets and in management of the affected crop both within and outside the affected area. It is critical that confirmation and delimiting surveys be as timely and complete as possible before releasing information.

Because of the widespread nature of these crops, effective communication with other federal, state, and industry is important in managing these diseases.

State Plant Health Laws: There are few if any regulations that would apply to these situations. The Black Stem Rust Law may have some implication to controlling the disease on wheat.

Mitigation measures: Crop resistance in an important mitigation measure with races of the Puccinia group which attack wheat and other cereals. Fungicide application must be cost effective and generally requires crop monitoring to accurately time the application for greatest efficacy. Crop destruction could be considered in some circumstances. This would be in the form of burning, herbicide application, or cultivation. Crop rotation to a non related plant is the most effective control as many of these rust diseases are highly specific in the type of plant they infect.

Export Commodity Assurance: In the case of rust diseases of cereals, they are not considered of importance to phytosanitary regulations and the ability to sell or transport the commodity. Some countries do regulate in sorghum seed for African sorghum ergot. Rust diseases of horticultural crops have some regulations.

STEPS in addressing air borne rust diseases:

1. First Detection by general or specific survey
2. Confirmation as to species or race of a specific pathogen, Plant Disease Advisory Team makes recommendation to Policy team
3. Plant Disease Response Team discusses response based on factors of the pest, plant species affected, and source of infection.
4. Delimiting Surveillance if needed.
5. Communication within government agencies and industry groups, Public Information Team
6. Communication with public at large, Public Information Team
7. Mitigation measures recommendation of Advisory Team

WATCH LIST: Black stem rust of wheat and barberry, Asian soybean rust, African sorghum ergot.

Seed borne fungal, viral, nematode, and bacterial diseases:

This disease grouping contains numerous pathogenic diseases which could be introduced and cause harm to agronomic and horticultural crops. These diseases generally are dispersed from plant to plant through splashing rain or planting in infested soil and long distance dispersal by the movement of seed from one location to another. Plant health or phytosanitary regulations address this group of diseases at the international, federal, and state levels. These regulations require either the absence or a low infection or tolerance level for specified diseases or causal organisms.

At the local level, seed is commonly exchanged or planted from farm to farm without much regulation or documentation. Requirements for seed certification require purity, germination percentages, and freedom from weed seeds. Diseases are not commonly regulated or routinely surveyed. Seed is not generally sold via the Internet unless it is of a specialty horticultural type.

General surveillance or first detection: Original finds will likely be the result of a farmer or grower concerned about a plant disorder linked to a planting of a specific lot of seed. Diagnosis of the problem may be referred to a county extension agent, trade representative, or certifying agency (first identifiers). In some cases such as Karnal bunt, a specific surveillance program may be in effect and find a disease. The Plant Disease Advisory Team will meet, evaluate, and make recommendations to the Plant Disease Policy Team.

Quarantine, point of source investigations, and delimiting zones: Point of source investigations will be necessary generally to ascertain the extent of the exposure to the disease. It will be important to determine the source of the infection whether it was a natural endemic situation where the disease was present in the environment or that the seed infected before planting. If the seed was infected before planting then investigation should pursue the source(s) of the seed and determine what extent the seed was moved and the status of it. Stop sales or hold may be placed on infected or suspected infected seed. Point or source investigations will likely require official samples.

The Plant Disease Response Team may want to recommend further action on the incident. Quarantines may be initiated to limit any movement from a source to another site. A quarantine action may be the only legal tool to stop the movement from farmer to farmer or from one location to another location. Diseases which move rapidly and the primary means of movement is through the seed trade would be candidates for quarantines. The economic loss both direct and indirect should also be considered in the determining the need for quarantines. Quarantines could address situations where the seed is located or in fields or farms where the seed was planted or being held besides the movement of the seed. The causal organism, plant articles affected, and exposed equipment or materials should all be considered in the text of the quarantine action. The quarantine should address how items are released or what criteria allow the release of items from quarantine.

Law enforcement personnel may be needed to enforce quarantine or entry rights necessary to ascertain information or limit the disease.

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Delimiting surveys of crops planted to infected seed may be needed to ascertain information for quarantines or stop sales, hold, or other mitigation measures.

Confirmation protocol: Samples should be double bagged, labeled, and sent to a laboratory for confirmation. Plant material other than seed such as diseased plants may be collected for the confirmation protocol.

Seed sampling should be done by following recommended protocols for sampling of seed from the Kansas Seed Law (see Appendix 1).

Depending on the disease, a second confirmation by a federal identifier may be required for a state record.

The Great Plains Diagnostic Laboratory at KSU should be the primary confirmation facility. The Iowa Seed Testing Laboratory may also be utilized along with private laboratories certified by USDA for such tests.

Communication: The discovery of seed borne diseases that are exotic to the state or in the Great Plains Region could have a significant impact on the markets and in management of the affected crop both within and outside the affected area. It is critical that confirmation and delimiting surveys be as timely and complete as possible before releasing information.

The need for communication will be great if a quarantine action is put into place.

It is important for first identifiers to communicate disease reports of interest to the Plant Disease Advisory Group.

State Plant Health Laws: Current laws that apply to seed health include federal and state quarantine law regarding Karnal bunt and Kansas Plant Pest Act. The Kansas Seed Law does not directly regulate insects or disease in seed. Kansas Crop Improvement Association does have some tolerance or standards regarding diseases in reference to certification standards. Kansas does not have any specific regulations addressing seed disease restrictions from other states.

Persons or businesses selling or transporting seed are not considered Live Plant Dealers under the Kansas Plant Pest Act but the movement of diseased seed or propagative material can fall under the Act.

Mitigation measures: A number of mitigation measures including quarantine action are available to address a disease incident. The PDRT can consider a number of or variety of seed treatments which are effective in combating seed borne diseases. Hold and Destroy orders of diseased seed are also possible under the Kansas Plant Pest Act. Other mitigation measures include indirect control by planting to a crop or resistant variety that is not attacked by a specific disease and soil fumigation.

Export Commodity Assurance: Various government levels have phytosanitary regulations that are in place to address the movement of disease seed over long distances. The establishment of an important seed disease such as Karnal bunt would cause major implications to the related industries of wheat production. Pest free areas that meet International Standards for Phytosanitary Measures (ISPM No. 4) may have to be established with the aid of surveillance programs to enable movement of articles from Kansas.

STEPS in addressing fungal, viral, nematode, and bacteria diseases of seed

1. First Detection by general or specific survey
2. Confirmation
3. Plant Disease Advisory Group is advised and determines response with Policy Team.

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4. Plant Disease Response Team determines source of infestation, point of source investigation, delimiting surveillance of infested area,
5. Enact quarantine or issue hold and destroy orders to address infected seed
6. Communication within government agencies and industry groups, Public Information Team
7. Communication with public at large, Public Information Team
8. Mitigation measures recommendation of Response Team
9. Address export assurance program needs

WATCH LIST: Karnal bunt of wheat, dwarf bunt of wheat, flag smut of wheat, barley stripe virus, seed gall nematode of wheat, cysts nematodes as contaminants.

Nematodes in agronomic and horticultural crops

Plant parasitic nematodes are generally considered to be in the soil and infect the root systems of plants. These nematodes move primarily from one location to another by the movement of articles associated with soil contamination. Nematodes which attack above ground tissues of plants are also important but much less common than root infecting species. They move similarly from one location to another generally by the *movement of articles associated with the plant*. In some cases such as pine wilt, nematodes are moved from one location to another by a vector beetle.

In agronomic situations and some horticultural examples the root infecting nematode species may be present for a long period of time before populations are detectable. In these cases the use of machinery has likely spread the nematode to other fields or farms in the area.

In some horticultural situations such as bulbs or plants grown in soil, the nematode species can move very long distances such as from one country to another. Potato or other tuber or rhizome propagated plants should also be considered into this category.

There are numerous species of nematodes in this group which are measurable concern. Most are capable of over wintering across the state while others may be limited to more of the southern regions. The host range can be very specific as is the case with many of the cyst nematodes or it can be very large as is the case with the lesion nematode group.

General surveillance or first detection: Original finds will likely be the result of a farmer or grower concerned about a plant disorder. Diagnosis of the problem may be referred to a county extension agent, trade representative, or certifying agency (first identifiers). In some cases such as the potato cyst nematode, pine wilt, and cereal cyst nematode surveillance programs may be in effect and find a target species of concern. The Plant Disease Advisory Team will meet, evaluate, and make recommendations to the Plant Disease Policy Team.

Quarantine and delimiting zones: Delimiting surveys will likely play a significant role in determining the extent of infestation of nematode species. In field situations, nematodes may take several years of continuous cropping to build up populations to detectable levels. Sampling in field situations should be conducted in areas of a field where equipment is commonly introduced first to a field or in areas where introduction would occur. Point of source investigations should focus on the movement of equipment or other articles associated with a field. Equipment and the movement of soil from field to field is a very large concern since it can involve a wide variety of uses, occurs over time, and may occur of very long distances. Farm to farm equipment, commercial applicators, crop scouts, custom harvesters, wildlife, flooding, wind erosion, are all common to Kansas agriculture and provide the means for soil and nematode movement. Other local markets should be evaluated for a possible role in the movement of infected plants or infested soil. These include farmer markets, road side stands, and hobbyist groups that sponsor swap meets.

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In the case of bulbs, tubers, or rhizomes point of source investigations should also consider where the introduction came from to see if any regulations were breached or where the plant material was moved from the field to other locations.

Quarantines may be effective in reducing the spread of the nematode if it addresses the problem with intensive sampling and strict compliance in regulating machinery and the movement of plants.

Confirmation and sampling protocol: Soil should be sampled from the root zone of plants and be comprised of a number of sub samples combined into one sample (see seed sampling). The sampling should be biased toward entry points of fields or areas which have been cropped to susceptible hosts. Samples should generally not represent more than 10 acres and be comprised of enough sub-samples and soil to adequately represent the site. This is generally about 50 sub-samples making up a 4 lb sample.

In situations with foliar nematodes, plant material should be collected in sealable bags, refrigerated, and transported as quickly as possible to a qualified laboratory.

Confirmation will be made by morphological or DNA analysis of specimens by qualified nematologists at the Great Plains Diagnostic Laboratory at KSU, USDA identifiers, or other nematologists associated with the GPDN.

Communication: The discovery of nematode diseases that are exotic to the state or in the Great Plains Region could have a significant impact in management of the affected crop both within and outside the affected area. It is critical that confirmation and delimiting surveys be as timely and complete as possible before releasing information.

The need for communication will be great if a quarantine action is put into place.

It is important for first identifiers to communicate disease reports of interest to the Plant Disease Advisory Group.

State Plant Health Laws: Nematode introduction into the state is largely unregulated except in the case of plant propagative material such as tubers and bulbs sold in the horticultural industry. These items would fall under the Kansas Plant Pest act for meeting pest freedom standards.

Quarantines are the legal instrument with the highest potential to address infestations of small isolated infestations of nematode problems.

The establishment of a pest free area with related quarantine measures may also have a place if controlling the pest and allowing exports.

Mitigation measures: The PDRT can consider a number of educational and outreach measures to address the problem. The movement of soil is an overwhelming concern regarding nematodes. Hold and Destroy orders of diseased propagative materials are also possible under the Kansas Plant Pest Act. Other mitigation measures include indirect control by planting to a crop or resistant variety that is not attacked by a specific disease and soil fumigation.

Export Commodity Assurance: Various government levels have phytosanitary regulations that are in place to address the movement of nematodes over long distances. Pest free areas that meet International Standards for Phytosanitary Measures (ISPM No. 4) may have to be established with the aid of surveillance programs to enable movement of articles from Kansas.

STEPS in addressing nematodes of agronomic and horticultural crops

1. First Detection by general or specific survey

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2. Confirmation
3. Plant Disease Advisory Group is advised and determines response with Policy Team.
4. Plant Disease Response Team determines source of infestation, point of source investigation, delimiting surveillance of infested area,
5. Enact quarantine or issue hold and destroy orders to address infected seed
6. Communication within government agencies and industry groups, Public Information Team
7. Communication with public at large, Public Information Team
8. Mitigation measures recommendation of Response Team
9. Address export assurance program needs

WATCH LIST: There are numerous nematodes of concern to Kansas agriculture. Cyst nematodes are probably the highest profile group and include the cereal cyst nematode, Mediterranean cyst nematode, potato cyst nematode, golden nematode, and the corn cyst nematode. The following website lists some nematodes of national and international concern: <http://nematode.unl.edu/quaranem.htm>.

Other nematode diseases of concern include pine wilt in western Kansas and those nematodes which infect cotton.

New or unfamiliar diseases in agronomic and horticultural crops and of native plants

This group is general in terms of what diseases are included and the plant species. It includes viral, bacterial, and fungal disease not covered in the three previous groups. *Ramorum* blight, white rust of chrysanthemum, plum pox, and possible new strains of established diseases are examples which fit into this grouping.

Important considerations in addressing these diseases include the source of infection, can it survive within Kansas weather conditions, how is it transmitted, and what plants other than the original find does it infect. Additionally information about the host or other articles related to the host is needed to assess the pest risk and understand the potential for containment or eradication. Internet sales and trade of plants, hobbyists groups, firewood, and farmers markets are all examples of potential movement of plants or articles that are largely unregulated or monitored in some fashion for pests.

General surveillance or first detection: Original finds will likely be the result of a researcher, farmer or grower concerned about a plant disorder, or from general surveillance of a crop or native plant. Diagnosis of the problem may be referred to a county extension agent, trade representative, or certifying agency (first identifiers). Most disease reports will come either through the Great Plains Diagnostic Clinic or from inspections and surveillance of plants by the Kansas Department of Agriculture. Upon discovery and tentative identification the Plant Disease Advisory Team will meet, evaluate, and make recommendations to the Plant Disease Policy Team.

Quarantine and delimiting zones: Delimiting surveys will likely play a significant role in determining the extent of infection of this general group. Sampling in field situations should be conducted in areas of a field where equipment is commonly introduced first to a field or in areas where introduction would occur. In general, survey will continue from the origin find outward in a 360 degree approach. The surveillance zone may be several hundred feet to a mile extended from the origin. Point of source investigations should focus on the source of infection such as seed, the harvested plant or product and its destination, and the movement of equipment or other articles associated with a field or crop.

Quarantines may be effective in reducing the spread of new diseases if the disease is not wind borne and enough is understood about the epidemiology of the disease to adequately address quarantine regulation.

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Confirmation and sampling protocol: Plant material should be collected in sealable bags, refrigerated, and transported as quickly as possible to a qualified laboratory.

Confirmation will be made by morphological or DNA analysis of specimens by qualified diagnosticians at the Great Plains Diagnostic Laboratory at KSU, USDA identifiers, or other laboratories associated with the GPDN.

Local law enforcement may be needed to enter some locations for delimiting, point of source investigations, and obtaining samples.

Communication: The discovery of new or unfamiliar diseases that are exotic to the state or in the Great Plains Region could have a significant impact in management of the affected crop both within and outside the affected area and also on the markets. It is critical that confirmation and delimiting surveys be as timely and complete as possible before releasing information.

The need for communication will be great if a quarantine action is put into place.

It is important for first identifiers to communicate disease reports of interest to the Plant Disease Advisory Group.

State Plant Health Laws: Most horticultural plants have diseases regulated under the Kansas Plant Pest act for meeting pest freedom standards. In these instances, the plant material can be placed on hold and ordered destroyed or treated by the Kansas Department of Agriculture.

State quarantines are the legal instrument with the highest potential to address diseases in general if they are invasive and they are threat to the specific plant species.

Federal quarantine actions may exist for some diseases in this group.

The establishment of a pest free area with related quarantine measures may also have a place if controlling the pest and allowing exports.

Mitigation measures: The PDRT can consider a number of educational and outreach measures to address the problem. The movement of a disease either by a vector or with the crop or associated articles is an overwhelming concern. Hold and Destroy orders of diseased propagative materials are also possible under the Kansas Plant Pest Act. Other mitigation measures include indirect control by planting to a crop or resistant variety that is not attacked by a specific disease and soil fumigation.

Export Commodity Assurance: Pest free areas that meet International Standards for Phytosanitary Measures (ISPM No. 4) may have to be established with the aid of surveillance programs to enable movement of articles from Kansas.

STEPS in addressing new or unfamiliar diseases (general category):

1. First Detection by general or specific survey
2. Confirmation
3. Plant Disease Advisory Group is advised and determines response with Policy Team.
4. Plant Disease Response Team determines source of infestation, point of source investigation, delimiting surveillance of infested area,
5. Enact quarantine or issue hold and destroy orders if recommended
6. Communication within government agencies and industry groups, Public Information Team.
7. Communication with public at large, Public Information Team
8. Mitigation measures recommendation of Response Team
9. Address export assurance program needs

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WATCH LIST: There are numerous diseases that could fall into this broad category. New strains of a pathogen should also be considered. Some diseases in this group include white rust of chrysanthemum, ramorum blight, Ralstonia bacterial wilt of potato and geranium, plum pox, whitefly-crinivirus complex, potato wart, exotic downy mildews of corn and sorghum, and soybean dwarf virus.

APPENDIX 1: Seed Sampling

201.39 General Procedure. (a) In order to secure a representative sample, equal portions shall be taken from evenly distributed parts of the quantity of seed or screenings to be sampled. Access shall be had to all parts of that quantity. When more than one trierful of seed is drawn from a bag, different paths shall be followed. When more than one handful is taken from a bag, the handfuls shall be taken from well-separate points.

(b) For free-flowing seed in bags or bulk, a probe or trier shall be used. For small free-flowing seed in bags a probe or trier long enough to sample all portions of the bag should be used.

(c) Non-free-flowing seed, such as certain grass seed, uncleaned seed, or screenings, difficult to sample with a probe or trier, shall be sampled by thrusting the hand into the bulk and withdrawing representative portions. The hand is inserted in an open position and the fingers are held closely together while the hand is being inserted and the portion withdrawn.

(d) As the seed or screenings are sampled, each portion shall be examined. If there appears to be a lack of uniformity, the portions shall not be combined into a composite sample but shall be retained as separate samples or combined to form individual-container samples to determine such lack of uniformity as may exist.

(e) When the portions appear to be uniform, they shall be combined to form a composite sample.

201.40 Bulk. Bulk seeds or screenings shall be sampled by inserting a long probe or thrusting the hand into the bulk as circumstances require in at least seven uniformly distributed parts of the quantity being sampled. At least as many trierfuls or handfuls shall be taken as the minimum which would be required for the same quantity of seed or screenings in bags of a size customarily used for such seed or screenings.

201.41 Bags. (a) For lots of six bags or less, each bag shall be sampled. A total of at least five trierfuls shall be taken.

(b) For lots of more than six bags, five bags plus at least 10 percent of the number of bags in the lot shall be sampled. (Round off numbers with decimals to the nearest whole number, raising 0.5 to the next whole number.) Regardless of the lot size it is not necessary that more than 30 bags be sampled.

(c) Samples shall be drawn from unopened bags except under circumstances where the identity of the seed has been preserved.

201.42 Small Containers. In sampling seed in small containers that it is not practical to sample as required in 201.41, a portion of one unopened container or one or more entire unopened containers may be taken to supply a minimum size sample, as required in 201.43.

201.43 Size of Sample. The following are minimum sizes of samples of agricultural seed, vegetable seed and screenings to be submitted for analysis, test, or examination:

(a) Two ounces of grass seed not otherwise mentioned, white or alsike clover, or seeds not larger than these.

(b) Five ounces of red or crimson clover, alfalfa, lespedeza, ryegrass, bromegrass, millet, flax, rape, or seeds of similar size.

(c) One pound of Sudangrass, proso, hemp or seeds of similar size.

(d) Two pounds of cereals, sorghum, vetch, or seeds of similar or larger size.

(e) Two quarts of screenings.

(f) Vegetable seed samples shall consist of at least 400 seeds.

Karnal bunt special instructions: A five pound sample is usually required. This is usually a composite when bags, small containers, or packaged seed is sampled. In the case of researchers seed, then the amount is significantly smaller and dependent on the amount of available material. In bulk lots of 5000 or less pounds, a five pound sample is collected with sub-samples not exceeding ½ lb of seed.

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APPENDIX 2: Watch List of Plant Diseases in Kansas Agricultural Crops, Plantings, and Native Plants

Common Name	Scientific Name	Group	Crop or plant attacked	Comments
Black Stem Rust Race Ug99	<i>Puccinia graminis</i>	Wind blown rust	Cereals – wildgrass-wheat	Potential for bioterrorism
Asian soybean rust	<i>Phakopsora pachyrhizi</i>	Wind blown rust	Soybean and other legumes	Potential for bioterror; in US
African sorghum ergot	<i>Claviceps africana</i>	Wind blown rust	Sorghum species and related weeds	In US
Karnal bunt	<i>Tilletia indica</i>	Seed borne	Wheat and related cereals	Export significant, potential for bioterror, in US
Dwarf bunt	<i>Tilletia controversa</i>	Seed borne	Wheat	In US, export significant
Flag smut	<i>Urocystis tritici</i>	Seed borne, wind borne	Wheat and related grasses	In US, export significant
Barley stripe mosaic	Barley stripe mosaic virus	Seed borne	Wheat and barley	Not in US
Seed gall nematode	<i>Anguina tritici</i>	Seed borne	Wheat	Export significant
Cysts nemas as contaminants in seed	Various	Seed borne as soil peds	Various	Export, production
Pine wilt	<i>Bursaphelenchus xylophilus</i>	Nematode	Pines	In western Kansas only - not known
Potato cyst nematode	<i>Globodera pallida</i>	Nematode	Potato	In US, federal quarantine
<i>Ramorum</i> blight	<i>Phytophthora ramorum</i>	General group	Oaks and other woodys	In US, export, bio terror
Plum pox	Plum pox virus different strains	General group	Stone fruits	Under eradication in US
<i>Ralstonia</i> wilt or brown rot	<i>Ralstonia solanacearum</i> R3,bv2	General group	Potato geranium	Bio terror
White rust of chrysanthemum	<i>Puccinia horriana</i>	General group	Chrysanthemum species	In US
Whitefly vectored crinivirus	Various viruses in group	General group	Various, cotton, vegetables	Invasive
Exotic downy mildews of sorghums	<i>Peronosclerospora</i> spp.	General, may be wind blown	Corn and sorghum species	Exotic, bioterror Java, Phillipine, and brown stripe
Potato wart	<i>Synchytrium endobioticum</i>	General	Potato	Exotic
Root knot and cyst nematodes	Heterodera and Meloidogyne species	Nematode	Various	Invasive and exotic
Soybean dwarf	Soybean dwarf virus	General	Soybean	Aphid transmitted, exotic

APPENDIX 3: Lists of items for consideration to facilitate biosecurity issues regarding plant diseases

- 1. A formalized agreement (MOU) should be completed regarding the BioSecurity plan between Kansas Department of Agriculture and Kansas State University. Kansas State University would include the extension program, specific departments, and the diagnostic labs. It should address identify individuals or positions that serve on the various teams or groups contained in the plan and what services, responsibilities, or functions will be expected to facilitate this plan. It also should address the protocol for reporting of any new disease or previously unreported disease and those diseases on the watch list.**
- 2. The use or need for facility biosecurity plans should be considered. It is important for most facilities to have some basic plan in place in regard to disposal or treatment of plant material, location/maps of articles, inventory records, personnel, and records of plant transactions/jobs which might facilitate trace forward and trace back surveillance needs. This may be needed to be addressed by specific regulations. It is possible that a basic plan can be put together between KDA, KSU, and related industries.**
- 3. Identification of personnel and equipment within the Department of Agriculture that may be used in an emergency situation to facilitate the addressing of an issue. The inventory may identify the lack of needed personnel or equipment.**
- 4. Require reporting of diseases on the watch list by all individuals, parties, businesses active in the state regardless of location. This may be needed in rule or regulation for the state plant pest law.**
- 5. Identify mechanisms to request additional resources from other governmental agencies within the state of Kansas or from other states.**