

A Proposal by

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American Society of Agronomy
Council for Agricultural Science and Technology
Crop Science Society of America
Entomological Society of America
Society of Nematology
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Establish the National Center for Plant Biosecurity: A Center Designed to Meet the Challenges of HSPD-9

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Introduction

Many have long recognized that agriculture and other plant resources in the United States are vulnerable to biological attack. Crops are grown, and forests and rangelands are distributed, over very large areas with little possibility and feasibility for surveillance or monitoring. Our extensive national borders provide many opportunities for accidental or intentional introductions.

With leadership from the ARS, APHIS, and CSREES, the USDA and the Department of Homeland Security (DHS) have been working to bolster the current surveillance infrastructure, develop additional biosecurity capabilities, and ensure that the United States has the ability to anticipate, prevent, respond to, and recover from acts of bioterrorism. In addition to USDA and DHS agencies, many other organizations and individuals have been involved in efforts to improve our infrastructure. These organizations have included state and local governmental organizations, land-grant universities, agricultural producers and industry, and other for profit and nonprofit entities.

Despite the stellar efforts of many individuals and organizations over the past few years, we still have no mechanism for organized coordination across all entities. The effectiveness of the various programs continues to be hampered by the lack of coordination among the various programs and activities, inadequate means to assess the contributions of each organization toward the overall goals, and insufficient financial resources to maintain an effective plant biosecurity program in the current disparate system.

During the past two years, several organizations and individuals have worked to develop a mechanism for enhancing our Nation's capabilities to prevent and respond to events related to plant (crop, forest, and rangeland) security. These efforts led to the development of a proposal for the establishment of a USDA, in-house **National Center for Plant Biosecurity (NCPB)** that would be administered at the level of the Office of the Secretary of Agriculture and staffed by USDA employees. The USDA Center would build on existing resources and capabilities to

ensure that we have a strong national infrastructure for documenting, monitoring, and protecting U.S. agriculture against new or emerging plant diseases and pests. A robust, responsive infrastructure is needed whether the threat is from unintentional introduction, an act of bioterrorism, or any other intentional human introduction. The NCPB will provide a focal point to enhance, expand, and coordinate current efforts to defend against terrorist attacks, major disasters, and other emergencies.

Last year, comments were requested on a draft of the proposal for a NCPB and input has been collected from federal agencies, other scientific societies, and commodity groups. An American Phytopathological Society (APS) Workshop, held in Washington, D.C. in July 2003 and funded by a grant from the Department of Homeland Security, brought together participants and stakeholders for in-depth discussions and shaping of the proposal. As these inputs were being incorporated, President George Bush issued **Homeland Security Presidential Directive #9 (HSPD-9)** that called for the establishment of a national policy to defend the United States' agriculture and food system against terrorist attacks, major disasters, and other emergencies. HSPD-9 found that the United States agriculture and food systems are vulnerable to disease, pest, or poisonous agents that occur naturally, are unintentionally introduced, or are intentionally delivered by acts of terrorism. It further indicated that there was the need to provide the best protection possible against a successful attack on the United States agriculture and food system because such an attack could have catastrophic health and economic effects. We believe that the proposed NCPB will provide a strong framework and leadership for detecting, responding to, managing, and recovering from such events, as mandated in HSPD-9.

A key component of HSPD-9 was the development of a National Plant Disease Recovery System that would ensure our ability to recover from any intentional or unintentional outbreaks of a high consequence plant disease. HSPD-9 directed the Secretary of Agriculture to accelerate and expand agricultural biosecurity efforts in cooperation with other Federal agencies and entities. We believe that a USDA National Center for Plant Biosecurity would facilitate this cooperation and would ensure that the United States has the ability to anticipate, prevent, respond to, and recover from intentional or unintentional introductions of catastrophic plant diseases.

Summary and Purpose

The National Center for Plant Biosecurity will be a USDA, in-house center administered at the level of the Office of the Secretary of Agriculture. The Center will build on existing resources and capabilities to provide a state-of-the-art national infrastructure for documenting, monitoring, and protecting U.S. agriculture against new or emerging plant diseases and pests. Such activities are needed whether the threat is from unintentional introduction or is a result of bioterrorism or other intentional human introduction. The Center will provide a focal point to enhance, expand, and coordinate current efforts to defend against terrorist attacks, major disasters, and other emergencies. It will provide a strong framework and leadership for detecting, responding to, managing, and recovering from such events, as mandated by President George W. Bush in Homeland Security Presidential Directive/HSPD-9.

Homeland Security Presidential Directive/HSPD-9

On January 30, 2004, President Bush issued Homeland Security Presidential Directive/HSPD-9 (hereinafter referred to as HSPD-9) to establish a national policy to defend the United States' agriculture and food system against terrorist attacks, major disasters, and other emergencies. The directive found that the United States agriculture and food systems are vulnerable to disease, pest, or poisonous agents that occur naturally, are unintentionally introduced, or are intentionally delivered by acts of terrorism. The directive observed that the American agricultural and food system is an extensive, open, interconnected, diverse, and complex system providing potential targets for terrorist attacks. It further indicated that there was the need to provide the best protection possible against a successful attack on the United States agriculture and food system because such an attack could have catastrophic health and economic effects.

Under the policy set out in HSPD-9, the United States' agricultural and food system is to be protected from terrorist attacks, major disasters, and other emergencies by (1) identifying and prioritizing sector-critical infrastructure and key resources for establishing protection requirements; (2) developing awareness and early warning capabilities to recognize threats; (3) mitigating vulnerabilities at critical production and processing nodes; (4) enhancing screening procedures for domestic and imported products; and (5) enhancing response and recovery procedures.

HSPD-9 provides that the Secretary of Homeland Security is to continue to be responsible for coordinating the overall national effort to enhance the protection of the critical infrastructure and key resources of the United States. Further, the Secretary of the Department of Homeland Security is to continue as the principal Federal official to lead, integrate, and coordinate implementation of efforts among Federal departments and agencies, State and local governments, and the private sector to protect critical infrastructure and key resources. The Secretary of Agriculture and other specified agencies' heads are to continue to perform their responsibilities as Sector-Specific Agencies.

HSPD-9 also sets out a number of specific responsibilities to be carried out by the heads of various Federal agencies, including the Secretary of Agriculture. These responsibilities concern (1) awareness and warning, (2) vulnerability assessments, (3) mitigation strategies, (4) response planning and recovery (including the establishment of a National Plant Disease Recovery System), (5) outreach and professional development, and (6) research and development, among other things.

Development of the Proposal to Establish a National Center for Plant Biosecurity

For some time, the American Phytopathological Society (APS) and others have called for the establishment of a national center to provide leadership and coordination of initiatives in crop protection and security. In 2001, the APS Public Policy Board recommended that the government invest in infrastructure critical to reducing the vulnerability of the United States to crop bioterrorism. In response to growing concerns about potential bioterrorism attacks on American agriculture and the need for rapid responses to such attacks, the APS, with financial support from the ARS, APHIS, and CSREES, convened a two-day workshop in Washington, D.C., in March, 2003, entitled "Crop Biosecurity: Are We Prepared?"

In response to the March workshop, the U.S. Department of Homeland Security and the APS co-sponsored a workshop, “National Center for Crop Biosecurity,” in July 2003. Following the workshop, the Entomological Society of America (ESA) joined APS as co-author of, and other agencies and entities pledged support for, a proposal to establish a National Center for Plant Biosecurity (NCPB) that would provide the kinds of services and national leadership that are currently available for human diseases.

The enclosed proposal reflects the input of all present at the July workshop, along with comments from APS members, representatives from scientific societies and agricultural organizations, and other stakeholders. The proposal also reflects responsibilities set out in HSPD-9 relating to (1) Awareness and Warning; (2) Vulnerability Assessments; (3) Mitigation Strategies; (4) Response Planning and Recovery (including the development of a National Plant Disease Recovery System); (5) Outreach and Professional Development; and (6) Research and Development.

U.S. Vulnerability and Economic Impact of Plant Diseases and Pests

Vulnerability. The United States is unacceptably vulnerable to the purposeful or accidental introduction of a plant pathogen or pest that can affect significantly the quality or quantity of our food, feed, or fiber. Timely, comprehensive, and effective monitoring is difficult because crops are grown, and forests and rangelands distributed, over very large areas. Long lag periods may occur between the introduction and the detection of a plant pathogen, mycotoxin-producing microbe, arthropod pest, or invasive plant species. Our extensive National borders are “leaky”, providing many opportunities for accidental or intentional introductions. Large volumes of agricultural and forest products are exported and imported, and dunnage, logs, wood, and plants are potential carriers of dangerous organisms. For any given U.S. crop, several important pathogens and pests cause major losses elsewhere in the world but have not yet crossed our borders. Such exotic pathogens and pests could be obtained and introduced easily by those intending harm. Advances in biotechnology also make it possible to engineer genetically pathogens or pests to confer enhanced virulence, broader host range, ease of dissemination, avoidance of detection, or recalcitrance to management strategies.

Cost of Plant Diseases and Pests. Costs of plant diseases and pest infestations are high. More than 50,000 recognized plant diseases caused by fungi, viruses, bacteria, and other microbes occur each year in the U.S. In any given agricultural region, there may be 10–15 serious outbreaks of major crop diseases each year. More than 6,000 arthropods are considered pests and 150–200 species frequently cause serious damage. Overall strategies for addressing plant diseases and pests in the U.S. have focused on management rather than on eradication, so that losses are below an economic threshold. Impacts of serious diseases and pests of crops may result in:

- Reductions in yield and quality;
- High cost of management, both short-term (e.g., pesticide costs) and long-term (e.g., extensive breeding programs for crops resistant to diseases and pests);
- Trade disruptions and trade embargoes;

- Loss of markets, resulting in short-term and long-term costs;
- Increased costs and revenue losses associated with growing less-desirable crops;
- Higher food prices and unavailability of certain foods;
- Higher meat prices due to reduced availability of feed for livestock;
- Significant reductions in farm income and the potential for farm business failures;
- Human and animal health costs; and
- Costs resulting from adverse psychological reactions to an event.

Current Capabilities

Assuring plant and crop biosecurity requires that we protect our natural and cultivated plant resources from intentional introductions as acts of biosabotage, bioterrorism, or biowarfare. Although the circumstances of an intentional event may be different from those of a natural or unintentional introduction, the recommendations proposed herein will benefit U.S. agriculture regardless of whether there is ever a biological attack.

Many agencies and entities within the U.S. government, State and local governments, the private sector, universities, and other groups already are actively engaged in protecting U.S. plant resources from intentional or unintentional introductions of pathogens and pests. Key among them are the various agencies within the U.S. Department of Agriculture (especially the Agricultural Research Service [ARS], the Animal and Plant Health Inspection Service [APHIS], and the Cooperative State Research, Education and Extension Service [CSREES]), and within the Department of Homeland Security (particularly the Research and Technology Directorate and the Immigration and Borders Directorate). It is beyond the scope of this document to describe each of the contributors and the nature of their current responsibilities with respect to plant biosecurity. The purpose of the proposed National Center for Plant Biosecurity is to complement the many existing programs.

Need for Enhanced Capabilities

The aforementioned agencies have solid programs for prevention, detection, and management of plant pathogens and pests. However, such efforts are, of necessity, focused primarily on high-consequence, existing, or near-term threatening agents and events. Expanded efforts are needed to provide a strategic, long-range planning process, to enhance the current surveillance infrastructure, to develop additional biosecurity capabilities, and to ensure that the U.S. has optimal capacity to anticipate, prevent, respond to, and recover from acts of agricultural bioterrorism.

Several new efforts already are underway. For example, the recently established USDA-CSREES-associated National Plant Diagnostic Network (NPDN) links Land Grant University diagnostic laboratories, through five regional laboratories, with each other and with diagnostic laboratories of State Departments of Agriculture and of USDA-APHIS. To function optimally, the NPDN must have assured annual funding, additional personnel, a strategy for “surge capacity” (the ability of response entities to rapidly and effectively expand their operations in response to sudden events), and greater national coordination and communication. The USDA-ARS has been designated as the lead agency for the development of the National Plant Disease

Recovery System. In addition, USDA-APHIS has established the Center for Plant Health Science and Technology (CPHST) to provide scientific support to the Plant Protection and Quarantine (PPQ) division of APHIS and to ensure that the methods of the PPQ and field personnel are effective and efficient. The National Biodefense Analysis and Countermeasure Center (NBACC), established by the Department of Homeland Security, is charged to integrate national resources for homeland security, drawing on resources from public health, law enforcement, and national security. NBACC's mission is to provide an interdisciplinary capability to defend effectively against the full spectrum of human, animal, and plant BSL-3 and BSL-4 biothreat agents. Other Federal and State governmental agencies, universities, and other organizations, are implementing new programs and activities related to plant biosecurity as well.

Need for Strategic Planning

The many agencies and entities currently comprising the Nation's plant biosecurity community are charged with preventing and responding to national emergencies. Although there is a recognized need for a long-range vision for plant security and for strategic planning across agencies and disciplines, much of the work of agency personnel is directed to the management of often unpredictable outbreaks and immediate crises. Thus, a mechanism for coordination among the many entities comprising the Nation's plant biosecurity community may be inconsistent, and greater communication and interaction are needed to ensure that the Nation's needs are met in the most effective and efficient manner. Also needed are effective means by which to assess the contributions of each organization toward the overall goals and sufficient financial resources to maintain a highly effective, all-encompassing plant biosecurity program.

A Proposal for a National Center for Plant Biosecurity

A National Center for Plant Biosecurity (hereinafter referred to as "the Center") will be established in the U.S. Department of Agriculture, will be administered from the office of the Secretary of Agriculture, and will be staffed by federal employees. The USDA Center will build on and enhance current efforts in biosecurity by providing the strategic planning, long-range vision, and prioritization of needs and resources to ensure a state-of-the-art national infrastructure for documenting, monitoring, and protecting U.S. agriculture against new or emerging plant diseases and pests. The Center's contributions will support our Nation's agricultural enterprise regardless of the nature of the threat— whether it is the result of bioterrorism or one of the naturally occurring, emerging, or reemerging plant diseases or pests to which producers, foresters, scientists, and educators must respond. Should an introduction occur in spite of prevention activities, the Center would provide a central focus for a rapid, effective, and safe response, consistent with paragraph (18)(b) of HSPD-9 that requires the Secretary of Agriculture, working with other agencies, to develop a National Plant Disease Recovery System.

Significant, new investments in infrastructure and resources will be needed for this venture, and it is critical that the Center enhance, not impede, our Nation's security efforts.

Center Roles and Responsibilities

Many of the critical functions necessary for a strong plant biodefense capability are the responsibility of existing Federal and non-governmental agencies and programs. The proposed Center will not duplicate those efforts. Rather, the Center will function as a visionary, strategic planning, and coordinating entity, one component of the family of critical agencies and entities providing information to and receiving guidance from the Secretary of Agriculture as she or he fulfills the responsibilities of this Sector-Specific Agency. The Center also will be linked closely with DHS offices responsible for biosecurity, such as the Directorate for Research and Technology and the National Biosecurity and Countermeasures Center (NBACC). The Center will be the ultimate coordinating and communication nexus for these efforts, a nexus for the Nation's plant resource protection and a one-stop shop for contact and information on this subject. The Center also will ensure that the Nation's plant biosecurity efforts are applied effectively to the enhancement of U.S. agricultural systems during natural or accidental disease or pest outbreaks. Specifically, the Center will, among other things:

- Serve as an overarching entity with responsibility for coordination of all plant biosecurity activities by all Federal agencies;
- Provide leadership during specific breaches of biosecurity related to plants;
- Provide a focal point to help clarify which Federal agency has jurisdiction over different aspects of an event;
- Identify resources to address needs for surge capacity in reacting to suspected events;
- Foster communication and synergies between and among governmental, public, private, and professional entities;
- Ensure that the goals and objectives of the various plant biosecurity programs are implemented by the agency (or agencies) charged with programmatic responsibility; and
- Provide a "one-stop shop" for initial contact with the Federal government on matters related to plant bioterrorism.

These Center activities will be developed and administered in a manner consistent with, and supportive of, the responsibilities set out in HSPD-9.

1. Center's Awareness and Warning Activities

A. Support of Facilities and Capabilities. HSPD-9, paragraph (8), requires that the Secretary of Agriculture and other agency heads build upon and expand current monitoring and surveillance programs to:

- (a) develop robust, comprehensive, and fully coordinated surveillance and monitoring systems, including international information, for animal disease, plant disease, wildlife disease, food, public health, and water quality that provides early detection and awareness of disease, pest, or poisonous agents;
- (b) develop systems that, as appropriate, track specific animals and plants, as well as specific commodities and food; and

(c) develop nationwide laboratory networks for food, veterinary, plant health, and water quality that integrate existing Federal and State laboratory resources, are interconnected, and utilize standardized diagnostic protocols and procedures.

Consistent with this requirement, the Center will build on, support, and enhance existing and newly developed facilities and capabilities for detection, diagnosis, and communication with respect to incidents of threats to plant security, including those of the National Plant Diagnostic Network (NPDN), ARS, and APHIS-PPQ-CPHST.

To ensure that adequate resources are available for a distributed network for the rapid detection of plant pathogens and pests, the Center will:

1. Complement, enhance, and help coordinate functions of the NPDN, including coordinating input from scientific and professional advisory groups;
2. Serve as the primary point of contact for multinational seed companies, other agribusiness, and international research centers that have no natural link to any of the five NPDN regional centers;
3. In cooperation with APHIS, ensure that the most effective methods for rapid detection of pathogens and pests are implemented;
4. Establish protocols for reporting and responding in a systematic manner;
5. Ensure the establishment of baseline data for normal, routine occurrences of plant pathogens and pests;
6. Facilitate coordination with other entities critical to U.S. plant security, including State and APHIS laboratories and Integrated Pest Management Centers;
7. Identify resource and funding needs and develop strategies for addressing such needs;
8. Facilitate communication and cooperation between the NPDN and diagnostic entities in other nations where agents of concern are endemic, and
9. Build an internationally coordinated, global effort against the malevolent use of plant pathogens and pests.

The Center will support the coordinated national effort of APHIS-PPQ-CPHST and ARS to link research and outreach in the development and validation of standards for consistent diagnostic procedures. To the extent possible, such standards shall be state-of-the-art “gold standards” that include microbial sequence analyses that:

1. Differentiate at the subspecies or isolate level;
2. Reveal genetic modification of an otherwise familiar pathogen or pest; and
3. Facilitate a determination of the so-called “fingerprint of intent” (i.e., whether the event is intentional, accidental, or naturally occurring).

In addition, the Center, through stakeholder and scientific input, will support the development and implementation of strategic plans for state-of-the-art diagnostic tests, tools, and capabilities to:

1. Systematically prioritize diseases and pests for which the development of rapid, diagnostic tools and reagents and validation standards are needed;

2. Establish links with existing systems within the U.S., such as those related to seed testing (the National Seed Health System, the International Seed Federation, and the International Seed Testing Association);
3. Identify and prioritize needed disease, pathogen, or pest research, such as genomic sequencing or the sequencing of multiple strains of a particular threat agent, to develop more effective, rapid diagnostic tools or to facilitate forensic investigation (determination of the “fingerprint of intent”);
4. Coordinate and facilitate an expert review process for validating diagnostic tests, tools, and standards;
5. Promote use of improved diagnostic tools and standards, as they become available;
6. Create a mechanism for funding specific high-priority research or development of tools unlikely to result in a profit (“orphan” research or tools);
7. Create certification standards for Federal, State, or private plant diagnostic laboratories that will employ validated standards;
8. Create certification standards for individuals to perform validated diagnostic tests;
9. Develop, with appropriate agencies, a chain of responsibility with respect to the occurrence of an event involving a suspected or validated threat agent;
10. Support APHIS, the NPDN, and other entities as appropriate in development of training modules for the use of diagnostic tests, tools, and standards; and
11. Develop strategies for meeting identified priorities and associated funding requirements.

B. Coordination of Plant Biosecurity Efforts and Enhancement of Intelligence Capabilities. Under HSPD-9, paragraph (9), the Attorney General, the Secretary of Homeland Security, and the Director of the Central Intelligence Agency, in coordination with the Secretaries of Agriculture and other agency heads, are to develop and enhance intelligence operations and analysis capabilities focusing on the agriculture, food, and water sectors. These intelligence capabilities are to include collection and analysis of information concerning threats, delivery systems, and methods that could be directed against these sectors.

Paragraph (10) requires the Secretary of Homeland Security to coordinate with the Secretary of Agriculture and others to create a new biological threat awareness capacity that will enhance detection and characterization of an attack. This new capacity will build upon the improved and upgraded surveillance systems described in paragraph 8 and integrate and analyze domestic and international surveillance and monitoring data collected from human health, animal health, plant health, food, and water quality systems.

Consistent with these requirements, the Center, in collaboration with other agencies and organizations, will establish procedures to ensure that the Nation’s plant biosecurity programs and activities are coordinated to the greatest extent practical and are implemented in a manner that enhances the effectiveness of the entire plant biosecurity system. Among other things, the Center will:

1. Serve as a central clearinghouse for receiving and appropriately disseminating information from around the Nation related to biodefense threats, pathogen and pest surveillance results, and diagnostic assays, to ensure coordination of activities;

2. Develop procedures for collection and appropriate dissemination of information related to plant security from international sources including international agencies such as the Consultative Group on International Agriculture Research (CGIAR) and the United Nations Food and Agriculture Organization (FAO), international government agencies and research institutions, and international companies;
3. Develop mechanisms for receiving and using information from private companies and other entrepreneurial entities without compromising intellectual property agreements and plans;
4. Coordinate among Federal, State, and local governments
5. Coordinate with agencies and entities responsible for equivalent human and animal biosecurity, including the Department of Health and Human Services, the Center for Disease Control and Prevention, and others;
6. Ensure that procedures are established to direct information related to biosecurity to the intelligence and security communities and the DHS NBACC;
7. Establish procedures to ensure that the latest tools and reagents for pathogen and pest detection and identification are available to appropriate end users;
8. Evaluate current knowledge, infrastructure, and technology related to identified threats from plant pathogens and pests;
9. Assess the need for more capacity and/or for new and innovative knowledge, infrastructure, and technology, particularly as they relate to identified threat agents;
10. Evaluate current knowledge, infrastructure, and technology needs; and
11. Assess the need for more capacity and for new and innovative knowledge, infrastructure, and technology, particularly as they relate to identified threat priority agents.

The Center will assess approaches for the application of real-time databases on new and emerging plant diseases and pests, including naturally occurring migrations, accidental introductions, and new or emerging biothreats to crops that result from changes in agricultural practices. The database will:

1. Serve as background or baseline information on plant biosecurity;
2. Build on, extend, and support existing USDA and NPDN databases;
3. To the extent practicable, incorporate or include links to other domestic and international databases on such diseases and pests and related subjects that are maintained by governmental entities, educational institutions, nonprofit organizations, and the private sector;
4. Facilitate real-time analytical capabilities, to the extent possible;
5. Determine appropriate levels of access to the database, and establish mechanisms to maintain the security of sensitive information;
6. Include molecular information, such as genomic sequences and the biology and epidemiology of pathogenic agents and pests;
7. Indicate whether information in the database has been verified; and
8. Identify available expertise, diagnostic tools and reagents, and related laboratories.

2. Center's Vulnerability Assessments Activities

Paragraph (11) of HSPD-9 requires the Secretary of Agriculture and other agency heads to expand and continue vulnerability assessments of the agriculture and food sectors to identify requirements of the National Infrastructure Protection Plan developed by the Secretary of Homeland Security. The assessments are required to be updated every 2 years.

Consistent with this requirement, the Center, in collaboration with other agencies and organizations, will conduct frequent vulnerability assessments through a systematic approach that may include scenario-driven modeling. The Center also will develop strategies for addressing vulnerabilities discovered through such assessments.

3. Center's Mitigation Strategies Activities

Under paragraph (12) of HSPD-9, the Secretary of Homeland Security and the Attorney General, working with the Secretary of Agriculture and other agency heads, are required to prioritize, develop, and implement, as appropriate, mitigation strategies to protect vulnerable critical nodes of production or processing from the introduction of diseases, pests, or poisonous agents.

In addition, Paragraph (13) requires the Secretaries of Agriculture, Health and Human Services, and Homeland Security to build on existing efforts to expand development of common screening and inspection procedures for agriculture and food items entering the United States and to maximize effective domestic inspection activities for food items within the United States.

With the primary role of APHIS directed towards regulatory aspects of protecting the nation's food, feed, and fiber, the Center will work closely with all agencies charged to protect critical nodes of agricultural commodity production and processing to develop long-term strategic plans for enhancing and expanding activities for effective mitigation of threats from biological agents. Such activities will be consistent with the requirements of paragraphs (12) and (13) and will include:

1. Identification of the types of nodes in need of protection (seed stocks, production sites, storage and shipping functions, market sites, export facilities, etc);
2. Vulnerability assessment and prioritization of protective efforts for each node type;
3. Identification of effective mitigation strategies for each node type; and
4. Development of strategies for pest mitigation and suitability of current and emerging management tactics.

4. Center's Response Planning and Recovery Activities

HSPD-9 contains a number of requirements relating to response planning and recovery from a biosecurity event.

Under paragraph (14) of the directive, the Secretary of Homeland Security, in coordination with the Secretaries of Agriculture and other agency heads is to ensure that the combined Federal, State, and local response capabilities are adequate to respond quickly and effectively to a

terrorist attack, major disease outbreak, or other disaster affecting the national agriculture or food infrastructure. These activities are required to be integrated with other national homeland security preparedness activities developed under HSPD-8 on National Preparedness.

Paragraph (15) requires that the Secretary of Homeland Security, in coordination with the Secretaries of Agriculture and other agency heads, develop a coordinated agriculture and food-specific standardized response plan that will be integrated into the National Response Plan. This plan is to ensure a coordinated response to an agriculture or food incident and will delineate the appropriate roles of Federal, State, local, and private sector partners, and will address risk communication for the general public.

Under paragraph (16), the Secretaries of Agriculture and Health and Human Services, in coordination with the Secretary of Homeland Security and the Administrator of the Environmental Protection Agency, are required to enhance recovery systems that are able to stabilize agricultural production, the food supply, and the economy; rapidly remove and effectively dispose of contaminated agriculture and food products or infected plants and animals; and decontaminate premises.

In addition, paragraph (18)(b) requires the Secretary of Agriculture, in coordination with the Secretary of Homeland Security, and in consultation with the other agency heads, to work with State and local governments and the private sector to develop a National Plant Disease Recovery System (NPDRS). The NPDRS is required to be capable of responding to a high-consequence plant disease with pest control measures and the use of resistant seed varieties within a single growing season to sustain a reasonable level of production for economically important crops. The NPDRS is required also to utilize the genetic resources contained in the U.S. National Plant Germplasm System, as well as the scientific capabilities of the Federal-State-industry agricultural research and extension system. The NPDRS is required, as well, to include emergency planning for the use of resistant seed varieties and pesticide control measures to prevent, slow, or stop the spread of a high-consequence plant disease, such as wheat smut or soybean rust.

A. Response and Recovery Plans. Consistent with the aforementioned requirements of HSPD-9, the Center, acting in concert with existing agencies and entities, will serve as a nexus for development and regular revision of response and recovery plans related to the introduction of a suspected or validated threat agent targeting the Nation's plant resources. Responsibilities include the:

1. Development of rapid response scenarios for mitigating the effects of high-threat agents, to include:
 - a. specific action plans for key threat agents, including designations of jurisdictions;
 - b. chains of responsibility with respect to the occurrence of an event;
 - c. plans for stockpiling key fungicides, bactericides, and insecticides for such agents;
 - d. specific mechanisms for surge responses; and
 - e. specific plans for timely dissemination of critical information to those who need to know; and

2. Development of a plan for maintenance and deployment of seed stocks and germplasm for the replacement of crops lost due to an introduced agent.

B. Development of a Database of National and International Expertise. The Center will develop, consistent with the provisions of HSPD-9, a multi-level database of national and international scientists from government agencies, universities, and the private sector who have documented expertise on pathogens and pests of concern, and of laboratories that are available as resources in the event of a biosecurity event caused by a known or unknown pathogen or pest. The database will build on existing databases of expertise and will be developed in consultation with other governmental agencies, educational institutions, scientific societies, nonprofit organizations, and the private sector. The database of expertise and laboratory capabilities will:

1. Provide a resource for obtaining prompt and accurate, or confirming, diagnoses;
2. Provide authorities with the best and most complete available information about any given pathogen or pest and how it may be controlled, contained, or eradicated;
3. Link to other domestic and international databases of expertise in plant-related security issues; and
4. Provide rapid access to critical, consistent information by law-enforcement and regulatory authorities, thereby minimizing the chance of releasing inconsistent and possibly contradictory information.

In developing this database, the Center, in consultation with other agencies, scientific societies, universities, laboratories, and private sector entities, will determine:

1. Who should be included in the database;
2. Who will have access to the database and whether any part of it will be accessible by the public;
3. The scope of pathogens and pests to be included in the database; and
4. The best method for utilizing experts in the database with the least possible intrusion or disruption of their normal activities.

5. Center's Outreach and Professional Development Activities

HSPD-9 contains a number of requirements concerning outreach and professional development.

Under paragraph (19) of the directive, the Secretary of Homeland Security, in coordination with the Secretaries of Agriculture and other agency heads, is required to work with appropriate private-sector entities to establish an effective information-sharing and analysis mechanism for agriculture and food.

Paragraph (20) requires the Secretaries of Agriculture and Health and Human Services, in consultation with the Secretaries of Homeland Security and Education, to support the development of and promote higher education programs for the protection of animal, plant, and public health. To the extent permitted by law and subject to the availability of funds, the programs are to provide capacity building grants to colleges and schools of veterinary medicine, public health, and agriculture that design higher education training programs for veterinarians in

exotic animal diseases, epidemiology, and public health, as well as new programs in plant health diagnosis and treatment.

Under paragraph (21), the Secretaries of Agriculture and Health and Human Services, in consultation with the Secretaries of Homeland Security and Education, are required to support the development of and promote a higher education program to address protection of the food supply. To the extent permitted by law and subject to the availability of funds, the program will provide capacity-building grants to universities for interdisciplinary degree programs that combine training in food sciences, agricultural sciences, medicine, veterinary medicine, epidemiology, microbiology, chemistry, engineering, and mathematics (statistical modeling) to prepare food-defense professionals.

Paragraph (22) requires the Secretaries of Agriculture, Health and Human Services, and Homeland Security to establish opportunities for professional development and specialized training in agriculture and food protection, such as internships, fellowships, and other post-graduate opportunities that provide for homeland security professional workforce needs.

Consistent with the requirements of HSPD-9, the Center will play a major role in the development of educational and training programs and materials, as well as long-term education and training and post-graduate training and development.

A. Development of Educational and Training Programs and Materials. A robust infrastructure for protection of U.S. crops and other plant resources into the future will require significantly more personnel trained at all levels. Training for individuals, such as county extension agents, crop consultants, Master Gardeners, producers, and port-of-entry inspectors, who are likely to be the “first detectors”, will be needed to enhance their awareness of the potential for an event and to prepare them to alert the appropriate agencies and begin an appropriate response.

The Center will coordinate the development and use of educational materials for training potential first-line responders, as well as governmental officials, university personnel, and others as deemed appropriate. This coordinated effort will include, among other things:

1. An assessment of existing educational and training resources, including classroom and laboratory facilities available in key locations;
2. A priority list for the development of new educational and training materials, and for the identification or acquisition of needed training facilities;
3. Recognition of the need for different educational materials for specific, targeted audiences (e.g., first-responders vs. growers); and
4. Standards for quality control of information contained in the materials.

In addition, the Center will coordinate and prioritize efforts to ensure that first-responders and other personnel receive adequate training. This effort will include, among other things:

1. An assessment of existing mechanisms for training;
2. Utilization of existing mechanisms for delivery where appropriate and effective; and
3. Strategies for ensuring that adequate, trained instructors are available.

B. Long-term Education and Training. For the longer term, significant numbers of new M.S. and Ph.D. holders in Plant Pathology, Entomology, Weed Science, and other plant health-related fields are needed to fill positions in applied research, teaching, and extension/outreach at U.S. Federal and State laboratories, universities, and private companies. Our Nation's current gaps in personnel in these areas are dangerously large. In addition, the number of graduate programs in the applied plant sciences has declined significantly over the past decade, and further erosion is anticipated.

The Center will coordinate and prioritize efforts to revitalize and enhance relevancy of applied plant science graduate programs. The Center will:

1. Assess current capabilities and programs for training U.S. graduate students in plant security areas;
2. Prioritize educational needs for plant biosecurity-related jobs; and
3. Ensure that adequate capacity-building grants to colleges and schools of agriculture are available for identified graduate training programs.

C. Post-graduate training and development. Near-term initiatives to enhance our Nation's immediate preparedness for a threatening event will require re-training and specialized development of current researchers, educators and other professionals in Plant Pathology, Entomology, Weed Science, and related fields. The Center will work with agencies, universities, and other entities to develop a program of sabbaticals, internships, fellowships, and other post-graduate development and training opportunities in the area of homeland security.

D. Creation of a Public Relations Program. The Department of Homeland Security (DHS) is the agency with primary responsibility for public relations with respect to terrorist and other threats to the Nation. Therefore, to the extent requested by the Secretary of Homeland Security, the role of the Center with respect to public relations of plant-related biosecurity events will be to:

1. Provide and coordinate public relations in cases of biosecurity events, including cases of national emergencies that involve potential or proven acts of bioterrorism;
2. Plan proactive public relations activities;
3. Promote public awareness of the importance of plant biosecurity and related issues;
4. Ensure that a consistent message is given to the media and the public;
5. Utilize the database of experts to assure that the media and the public have access to the best information available; and
6. Prevent the release of sensitive information.

6. Center's Research and Development Activities

There are a number of requirements in HSPD-9 relating to research and development activities of various Federal agencies.

Under paragraph (23) of the directive, the Secretaries of Homeland Security, Agriculture, and Health and Human Services and other agency heads, in consultation with the Director of the

Office of Science and Technology Policy, are required to accelerate and expand the development of current and new countermeasures against the intentional introduction or natural occurrence of catastrophic animal, plant, and zoonotic diseases. The Secretary of Homeland Security is to coordinate these activities. This effort is to include countermeasure research and development of new methods for detection, prevention technologies, agent characterization, and dose response relationships for high-consequence agents in the food and the water supply.

Paragraph (24) requires the Secretaries of Agriculture and Homeland Security to develop a plan to provide safe, secure, and state-of-the-art agriculture biocontainment laboratories that research and develop diagnostic capabilities for foreign animal and zoonotic diseases.

Paragraph (25) requires the Secretary of Homeland Security, in consultation with the Secretaries of Agriculture and Health and Human Services, to establish university-based centers of excellence in agriculture and food security.

The Center's research and development activities will involve (1) support of targeted research initiatives, (2) establishment of pathogen and pest collections, (3) assessment and support of U.S. research facilities, and (4) assessment of research needs related to plant biosecurity. These activities will be developed and conducted in a manner consistent with the provisions of HSPD-9.

A. Targeted Research Initiatives. The Center will take an active role in supporting targeted new research initiatives that will enhance our ability to prevent, detect, respond to, and recover from the introduction of a threat agent. Responsibilities will include:

1. Identification and prioritization of needed disease, pathogen, or pest research, such as genomic sequencing or the sequencing of multiple strains of a particular threat agent, to develop more effective, rapid diagnostic tools or to facilitate forensic investigation (e.g., determination of the "fingerprint of intent;"); and
2. Incorporation of enhancements to diagnostic tools and standards, as they become available.

B. Establishment of Pathogen and Pest Collections. The Center also will ensure the establishment and maintenance of a central database on culture collections of plant pathogens and arthropods held by investigators within and outside the United States to ensure the protection of those collections for reference purposes and to provide taxonomic information on the global diversity of plant pathogens and pests. The database shall build on and be linked to other databases already maintained by other agencies and organizations and by individual investigators and industry scientists. Given the improbability of having the capacity to develop and maintain collections of all pathogens and pests, the Center will lead an effort, in collaboration with other agencies, organizations, and individuals, to identify priorities for maintaining and building collections as resources become available.

With respect to existing collections, the Center, in collaboration with other agencies, organizations, and individuals, will ensure that the following issues are assessed and addressed where applicable:

1. The loss of pathogenicity of certain organisms in culture;
2. The propagation and maintenance of pathogens and arthropods on live plants;
3. The quality of university, museum, government, and private collections;
4. The potential loss of key collections due to inadequate funding;
5. Assessment of the availability and quality of genetic information of pathogens and pests, including genetic variation within natural populations, and potential confusion between threatening agents and closely related, non-threatening agents;
6. The application of collection information to enhance understanding of critical systematic and phylogenetic relationships; and
7. Coordination and communication of information contained within the many collections nationwide.

C. Assessment and Support of U.S. Research Facilities. The Center will oversee the assessment of our Nation's research facilities with respect to plant biosecurity. The activities of the Center in this regard will include:

1. Surveying and maintaining an inventory of government, university, and private laboratory facilities;
2. Identifying those facilities that need to be renovated or upgraded;
3. Prioritizing needed improvements;
4. Addressing safety and security issues; and
5. Determining whether appropriate containment facilities are available when needed.

D. Assessment of Research Needs Related to Plant Biosecurity. The Center, in cooperation with ARS, APHIS, CSREES, land-grant institutions and other universities, will take an active role in identifying research needs and the mechanisms for accomplishing targeted research initiatives. In the development of research priorities and in coordinating support for research needs related to plant biosecurity, the Center will collaborate with other Federal, State, and local agencies, the scientific community, private companies, scientific societies, and other organizations. This collaboration will enhance our ability to:

1. Evaluate current knowledge, infrastructure, and technology;
2. Assess the need for more capacity and/or for new and innovative knowledge, infrastructure, and technology, particularly as they relate to identified threat priority agents;
3. Identify and prioritize research deemed critical to plant biosecurity issues;
4. Identify resources needed to support and fund critical research, including the establishment of university Centers of Excellence;
5. Identify opportunities for cooperation in conducting plant biosecurity research to avoid inappropriate duplication;
6. Determine the appropriate entities and mechanisms for conducting critical research;
7. Determine what, if any, restrictions are necessary for conducting research related to plant biosecurity and reporting its results;

8. Work with the APHIS and others to develop a reasonable and timely regulatory permitting system for importation and movement of pathogens and pests to protect U.S. agriculture while facilitating critical scientific research;
9. Minimize the disincentives for scientists that result from regulatory restrictions by ensuring a minimal invasion of scientists' privacy, minimal inconvenience and delay, and minimal limitations of personnel access to enhance the performance and utilization of the science and innovation most needed; and
10. Recommend how available funds are to be distributed.

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