REVIEW DRAFT: April 5, 2007

Strategic Plan
The National Plant Disease Recovery System

## INTRODUCTION AND BACKGROUND

Homeland Security Presidential Directive-9 (HSPD-9), "Defense of United States Agriculture and Food" signed by President Bush in January 2004, directs Federal, State, and local governments working with industry to strengthen and expand initiatives to safeguard America's agriculture and food infrastructure from catastrophic events caused by biological, chemical, or radiological agents. This directive "establishes a national policy to defend the agriculture and food system against terrorist attacks, major disasters, and other emergencies." The agriculture and food infrastructure is complex, diverse, and open making it vulnerable to natural, unintentional, or intentional attacks from diseases, other pests, and poisonous agents that can result in catastrophic health and economic consequences to the US.

Under this policy, the Department of Homeland Security directs and coordinates implementation of activities and initiatives among other Federal, State, and local government agencies and the private sector. Further, implementation of this directive is to be accomplished according to HSPD-7, Critical Infrastructure Identification, Prioritization, and Protection and HSPD-8, National Preparedness. HSPD-5 strives to enhance the ability of the United States to manage domestic incidents by establishing a comprehensive Incident Management System to provide a consistent nationwide approach for Federal, State, and local governments to work effectively and efficiently together to respond to and recover from incidents. HSPD-10 addresses Biodefense for the 21st century and identifies Threat Awareness, Prevention and Protection, Surveillance and Detection, and Response and Recovery as the essential pillars of the national biodefense program.

HSPD-9 sets out a policy to protect the agriculture and food infrastructure by identifying and prioritizing critical components, vulnerabilities, and key resources for protection; developing early warning capabilities to threats; mitigating vulnerabilities; enhancing response and recovery procedures; and expanding research and development; and enhancing outreach, education, and professional development. Attachment 1 identifies the USDA agencies and other organizations with responsibility for implementing the requirements of HSPD-9.

Paragraph 18(b) of HSPD–9 directs the Secretary of Agriculture, in coordination with the Secretary of Homeland Security, and in consultation with the Secretary of Health and Human Services and the Administrator of the Environmental Protection Agency, to work with State and local governments and the private sector to develop a National Plant Disease Recovery System (NPDRS) 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 will 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 shall 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 Steering Committee, chaired by USDA and consisting of representatives from DHS, EPA, and a number of USDA agencies has been established to oversee the development of recovery plans. The Committee will coordinate activities of federal agencies with authority, responsibility, and expertise to create recovery systems for specific crops and diseases. The goal of the NPDRS is to develop capabilities and capacity to rapidly identify, respond to, and recover from any plant disease introduction. Initially, the NPDRS Steering Committee will provide oversight for recovery systems from among those crops that would be affected by the plant pathogens identified in the Select Agent List (Attachment 2) pursuant to the Agricultural Bioterrorism Protection Act of 2002 with the addition of wheat smut (rust). Additions to the priority list will be made with input from the Crop Germplasm Committees, the American Phytopathology Society, the American Seed Trade Association, CropLife International, and State institutions including land grant universities and agriculture departments.

Additional NPDRS Steering Committee functions include the coordination of recovery plans, the development of technologies and infrastructure, and program evaluation.

The Steering Committee envisions that the NPDRS will:

- Identify the Federal, State, local, and private sector infrastructure required to implement an effective recovery plan for each high-consequence disease
- Identify technologies required for recovery from specific disease outbreaks (e.g. plant resistance, pesticides, cultural practices, predictive modeling).
- Identify available treatments, including inventories and capacities for production and broad scale application, for registered and critical-use pesticides, and establish a portfolio of needed emergency exemptions.
- Identify gaps in technology that impact the NPDRS and provide support to fill the gaps.
- Develop a prioritized list of research needs and work with Federal agencies and other stakeholders to obtain needed resources to carry out the work.
- Identify compensation available to affected producers.

Recovery systems will be dependent upon diverse technology and well-prepared personnel. The key elements of recovery plans will require the following:

- Diagnostics for rapid, practical and specific identification of pathogens
- Practical, statistically sound survey and detection methods
- Sound understanding of pathogens (taxonomy, biology, genetics)

- Accurate forecasting systems for each pathogen where it is practical to use such systems for timely disease mitigation
- Sound integrated disease management strategies and tools (chemical, cultural, resistant/tolerant varieties, biological control)
- A well-developed education and outreach plan and communications platforms
- Capacity to implement scientific, diagnostic, operational actions, especially to deal with unanticipated disease events

## INFRASTRUCTURE

The NPDRS builds on existing infrastructure to capitalize on the experience and working relationships that currently exist. The recovery from a naturally or intentionally introduced high consequence plant disease will require the utilization and coordination of infrastructure in agencies within the United States Department of Agriculture, the United States Environmental Protection Agency (EPA), State agriculture departments, the land grant university system, and the private sector. Roles played by each of these groups with infrastructure appropriate to facilitate recovery are identified. Because the success of any recovery effort will ultimately depend on growers' ability to manage the disease, the education and extension network of the state land-grant universities is the critical delivery system.

## DETECTION AND IDENTIFICATION

Rapid and accurate detection and identification of a plant disease threat is critical to effective response and recovery activities. The USDA Cooperative Research Education and Extension Service (CSREES) administers the funding and provides leadership for the National Plant Diagnostic Network (NPDN). Five regional labs located at Cornell University, The University of Florida, Michigan State University, Kansas State University, and The University of California at Davis and one support lab at Texas Tech University lead the network.

The primary objective of the NPDN is to establish a functional national network of existing diagnostic laboratories to rapidly and accurately detect and report plant diseases of national interest, particularly those pathogens that have the potential to be intentionally introduced through bio-terrorism. The establishment of the network has provided the means necessary for ensuring that all participating land-grant university diagnostic facilities are alerted of possible outbreaks and/or introductions and are technologically equipped to detect and identify pests and pathogens rapidly.

This has been accomplished by establishing an effective communication network of regional expertise, developing harmonized reporting protocols with the national diagnostic network participants, and cataloging pest and disease occurrences to be included in the national database.

Under the National Response Plan, Emergency Support Function #11 (Agriculture) if a suspect exotic plant disease or plant pest of quarantine importance is identified by an NPDN laboratory or State Department of Agriculture diagnostic laboratory, contact is immediately made with the State Plant Regulatory Official as well as the State Plant

Health Director of the USDA, APHIS, Plant Protection and Quarantine (PPQ). The State Plant Health Director then notifies the PPQ program's regional and headquarters offices that a suspect sample is being forwarded for confirmation.

Prior to initiation of an emergency response, a suspect specimens of exotic plant disease or plant pest of quarantine importance from NPDN or other diagnostic laboratories must be confirmed by a specialist recognized as an authority by the USDA, APHIS PPQ's National Identification Services unit. Once confirmed, the appropriate PPQ Region Director and the Assistant Deputy Administrator for PPQ Emergency and Domestic Programs notifies the State Plant Regulatory Official and the State Plant Health Director in the State of origin that the presence of the exotic plant disease or plant pest has been confirmed. The Assistant Deputy Administrator then notifies the National Plant Board and all trading partners.

USDA APHIS PPQ will certify and accredit NPDN laboratories for conducting diagnostics on exotic diseases of quarantine significance to make determinations after the initial first US detection is confirmed. NPDN laboratories may assist with surge capacity and other diagnostic activities for those organisms. Suspect specimens that represent potentially new state records are forwarded to the USDA, APHIS, PPQ designated authority for confirmation.

The APHIS National Agricultural Pest Information System (NAPIS) provides information on significant pest outbreaks and movement within the United States and is a potential resource for NPDRS disease tracking and monitoring. NAPIS was designed to provide information on new detections of exotic pests, particularly those that are of quarantine significance and may have an impact on commerce and trade, including invasive species that may be in the same category. As such, it provides information on the regulatory status of these pests, county-by-county throughout the United States. The system relies heavily on cooperative agreements between APHIS and the State departments of agriculture within a national Cooperative Agricultural Pest Survey program. It is the USDA's only system that provides reporting and mapping capability in direct support of its regulatory pest programs.

The need for an early alert system to identify emerging potential threats on a global basis has led to the recent creation of the Overseas Pest Information System (OPIS). Housed within APHIS, OPIS is intended to function as a clearinghouse and data base to track significant pest outbreaks and disease emergence in foreign nations. Currently, researchers and multinational seed companies report disease incidents to the OPIS system.

**RESPONSE**

After a detection of an exotic plant disease of quarantine importance has been confirmed by a USDA, APHIS, PPQ recognized authority, APHIS, in cooperation with the State Department of Agriculture, is responsible for the response. The response may be immediate in the form of advance assessment teams of experts and survey personnel sent to the site of initial detection to place holds, conduct investigations, and initiate delimiting surveys. Further response activities are conducted using methods mandated under the National Incident Management System (NIMS) including the use of the Incident Command System (ICS) for organizing the response. Actions that may be taken

include regulatory measures to quarantine infested or potentially infested production areas, stop the movement of infested or potential infested articles in commerce, and control measures which may include host removal and destruction, pesticide application, or required sanitary practices. APHIS' authority under the Plant Protection Act allows the Secretary to declare an emergency or extraordinary emergency which will have bearing on the release of emergency funds, the ability to quarantine a state, and the authority to pay compensation. APHIS imposes quarantines and regulatory requirements to control and prevent the interstate movement of quarantine significant diseases or regulated articles and works in conjunction with states to impose these actions parallel to state regulatory actions which restrict intrastate movement.

**SELECT AGENT REQUIREMENTS**

In the future, other laboratories may obtain certification and registrations for making presumptive positive determinations but must abide by guidelines set under various permit and authorizations maintained by APHIS Plant Protection and Quarantine.

PPQ permit and registration requirements for plant diseases and laboratories fall under two authorities, the Plant Protection Act (7 CFR Part 330) and the Agricultural Bioterrorism Protection Act of 2002 (7 CFR Part 331). Laboratories receiving suspect infected plant material or cultures are required to have PPQ permits. Laboratories possessing, using, or transferring select agents are required to be registered as a select agent laboratory. However, diagnostic laboratories that identify select agents are exempt from this requirement as long as they complete an APHIS/CDC Form 4 and destroy or transfer infected material to a laboratory registered with the APHIS Select Agent Program within the mandatory calendar 7 days.

The Plant Protection Act permit requirements apply to all plant pests and infected plant material, including diagnostic samples, regardless of their quarantine status. If any material is shipped interstate, it is a requirement that the receiving laboratory has a permit. For further guidance on permitting of plant pest material, consult the PPQ permit website at: http://www.aphis.usda.gov/ppq/permits/ or contact PPQ Permit Services on (301) 734-8758.

Federal regulation on Agricultural Bioterrorism Protection Act of 2002 (7 CFR Part 331) specifies requirements for possession, use, and transfer of organisms listed as select agents and toxins. Once an unregistered diagnostic laboratory identifies a select agent, they must immediately notify the APHIS Agriculture Select Agent Program, complete an APHIS/CDC Form 4 and submit within 24 hours, and either destroy or transfer the agent to a registered entity within 7 days. In compliance with this Act, if a diagnostic laboratory held back part of a screened sample for voucher purposes and that sample forwarded to the USDA Beltsville Laboratory came back as positive for a select agent, the diagnostic laboratory is required to notify the APHIS Select Agent Program immediately. If the determination of the unregistered laboratory is to destroy the sample, this must take place within seven (7) calendar days of results notification and PPQ Safeguarding Specialist must be provided the opportunity to witness the destruction of the sample on or before the 7-day period expires. Clarification of this and other information related to adherence to the select agent regulations is available on the following APHIS website: http://www.aphis.usda.gov/programs/ag_selectagent/index.html, or call (301) 734-5960.

## INTEGRATED PEST MANAGEMENT (IPM)

IPM is a multi-strategy approach to managing weeds, insect pests and pathogens. Elements of IPM programs for diseases of high consequence may be used in regulatory response programs and to implement recovery from high consequence plant pathogens. IPM practices are broadly integrated into the recovery effort to minimize the impact on crop productivity. Many farmers currently practice IPM.

The land grant university education and extension system is the primary infrastructure delivering IPM programs to the agricultural producers. In addition, independent crop consultants, the Regional IPM Centers and the Agricultural Research Service (ARS) contribute to the development and deployment of IPM strategies for disease management and recovery.

IPM strategies include prevention, avoidance, monitoring, and suppression. Many tactics may be employed within each of the strategies in order to have a successful IPM program.

Ultimately, after the regulatory response (once recovery has begun) the grower will be responsible for the acquisition and application of the appropriate chemicals for control of the high consequence plant disease. The State Plant Regulatory Officer (SPRO) and extension personnel will be responsible for insuring the most current information on chemical control is available within each State that is affected by the disease. In each region, the IPM Regional Centers will be in a position to provide information on the use of chemicals and other measures to control high consequence plant diseases on a regional basis. CSREES, ARS, EPA and APHIS will use existing networks to provide information on chemical control of disease.

## REGISTRATION OF CHEMICAL CONTROLS

Working with EPA, registrants, and the States, chemical registration either through the full FIFRA Section 3 process or, more likely in the short-term, through the emergency exemption process under Section 18 may be required. As in the case of Soybean Rust, the approach is to have chemical controls approved and ready in order to manage a disease outbreak.

Preparedness before the fact will ensure that product is labeled for the use in advance of the emergency. Prior approved labels will also provide the chemical registrants with enough certainty to ensure that some supplies (stocks) are available to respond to an outbreak.

For each of the listed APHIS select agent pathogens (attachment 2), wheat rusts, and additional priority pathogens, USDA, in cooperation with the Regional Integrated Pest Management Centers and land grant university experts, will identify chemical and cultural controls that have been proven effective in areas of the world where the diseases are currently endemic. Attachment 3 is a preliminary identification of possible controls for the priority pathogens and vectors. Expert opinion will also be used to identify alternative potential control strategies. Most microbial disease organisms have the propensity to develop resistance to single chemicals or single chemical classes. Therefore, control strategies that employ multiple chemical classes with different

mechanisms of action are considered more robust. The identification of chemical control options will include as many alternatives as possible.

Multiple strategies and chemicals are also needed because the production, storage, and distribution capacity of any one product may not be adequate to respond to the sudden demand for the additional treatment of millions of acres. Multiple chemicals and strategies and the inclusion of pesticide manufacturers, formulators and distributors in the process, will maximize the potential for adequate capacity.

Once the list of proven and potential chemical controls is established, EPA will determine the current regulatory status of each product.
Chemical pesticides are important in IPM programs, and their use is frequently required to achieve economical control of pest populations. Chemical pesticides should be applied in suppression systems using the following sound management approach: (1) The cost-benefit is confirmed prior to use (using economic thresholds where available); (2) The chemical of choice is selected based environmental and health considerations in addition to efficacy and economics; (3) Where economically and technically feasible, precision agriculture or other appropriate technology is utilized to limit pesticide use to areas where pests actually exist or are reasonably expected; (4) Sprayers or other application devices are properly calibrated and maintained; and (5) Chemicals with the same mode of action are not used continuously on the same site in order to avoid resistance development.

Because the diseases of concern are not endemic or widespread in the United States, pesticide chemicals may not be registered. The identification of efficacious chemicals for either full or emergency registration is an ongoing process involving multi-national pesticide manufacturers as well as research scientists from ARS and the universities.

Pesticide Registrants play a vital role in the availability of pesticides. Ramping up production and/or rerouting and delivery to areas of critical need may be a consideration during response and recovery efforts. The assessment of stocks along with their location and availability will require the cooperation of pesticide registrants and agrochemical retailers.

## PLANT RESISTANCE

Resistant cultivars are an important component of many IPM systems and are likely the most cost-effective long-term solution to plant diseases. Successful use of resistant cultivars in recovery efforts is dependent of the availability of agronomically acceptable resistant cultivars that meet industry demands for other attributes as well. Development of resistant varieties is a long-term activity undertaken by the ARS, land grant universities, and private industry. A significant challenge to the development of cultivars is that disease organisms can and do evolve, sometimes within a single growing season, to overcome the resistance characteristic. The success of resistant cultivars is dependent upon an understanding of the crop and the cultivars that may be available, as well as epidemiology of the pathogen.

The ARS manages and coordinates the activities of the National Plant Germplasm System (NPGS). The NPGS repository home page (http://www.ars-grin.gov/npgs/rephomepgs.html) identifies 28 collections or repositories within the U.S.

Many of these collections of plant species represent major U.S. crops and their relatives, and many of these are the hosts of several exotic high consequence pathogens. These collections are not stocks of commercially ready cultivars, but rather germplasm sources for genes that may ultimately be incorporated into breeding schemes for the development of future disease resistant cultivars. Given that resistance breeding often requires several seasons to produce acceptable lines, these collections represent valuable resources for the long-term development of resistant germplasm. Since these collections have not been screened for specific resistances to exotic pathogens, these collections are unlikely to play significant roles in the immediate recovery of a major U.S. crop after the wide spread incursion of a high consequence pathogen.

Current ARS efforts to develop cultivars of important crop species with resistance to exotic high consequence pathogens, especially the Select Agents may be found at: http://www.ars.usda.gov/pandp/locations/locations.htm?modecode=19-20-00-00&projectlist=all. Projects include breeding for resistance of soybean to rust *(Phakopsora pachyrhizi)* and resistance of stone fruits (*Prunus* germplasm) to Plum Pox Virus. There are no commercially viable cultivars available for select agents at this time.

Most seed companies are international and have their own germplasm collections from which they select new lines for commercial use. Presumably these corporations are working toward development of resistant cultivars for high consequence pathogens. Currently, very little is known about resistance to the specific pathogens within US germplasm, partly because working on exotic pathogens within the U.S. requires costly and limited containment facilities. Although some information is available from foreign countries, foreign germplasm has not been fully integrated into US repositories.

## TECHNOLOGIES REQUIRED FOR RECOVERY

The NPDRS will identify new or unknown pathogens, determine their geographic origin, and biologically characterize them. Accurate taxonomic identification including classification of such pathogens is essential. Pathogenicity studies and molecular markers are needed to discriminate isolates and determine host range. Infectious pathogens from purposeful or malicious introduction need to be rapidly identified and controlled. Continued development of pathogen detection, exclusion, and quarantine treatment technologies is important, both for keeping new diseases from becoming established in the U.S., and in producing crops and commodities that can be shipped and sold in markets around the world.

Research and development of new disease management technologies, particularly biologically-based ones, such as host-plant resistance, biological control, cultural control, and others are required. Research on integration of different control technologies into effective, economical, and sustainable integrated disease management systems will be emphasized so that practical solutions can be transferred to agricultural producers, processors, and land managers.

New technologies are needed to strengthen the U.S. capacity and ability to more quickly detect, control, and recover from sudden disease epidemics. Research to: 1) discover and exploit naturally occurring and engineered genetic mechanisms for plant pathogen control; 2) develop agronomic germplasm with effective and durable defensive traits; and

3) transfer these genetic resources for commercial use in the event of a devastating disease outbreak is needed. To achieve these goals efficiently, the NPDRS will utilize genetic materials and genomic resources to identify or create genes that protect plants against disease. Advances in genomics and biotechnology provide genetic tools that facilitate selection and development of desirable traits in crop species.

The NPDRS will develop and maintain accessible collections and databases of pathogens and genetic resistance factors to facilitate information sharing throughout USDA and with cooperating federal and State and private sector partners. Cultural, biological and chemical control strategies will be implemented to control disease outbreaks.

In some instances, where available germplasm does not appear to harbor identified and useful resistance alleles, the most prudent strategy may be to focus on the use of genetic engineering technologies to incorporate disease resistant genes from other germplasm sources. In such cases, it will be particularly important to develop collaboration with research institutions and governments of nations where the pests are endemic in order to secure approvals for field testing.

## GAPS IN TECHNOLOGY

Traditional methods have been used to assess species relationships including morphological characters, reproductive characters, and biochemical/physiological measurements. More recently, phylogenetic approaches have become widely used. However, new technologies are needed for rapid, accurate, and sensitive testing of large numbers of samples. We need to develop real-time field deployable surveillance methodologies and to develop and share rapid, reliable and robust detection technologies for pathogens of concern. Gaps also exist in molecular technologies used to differentiate species and strains. Additional DNA sequencing of relevant pathogens is needed in conjunction with genome annotation and cataloguing. Comparative genome analyses between relevant pathogens and related microbes will provide useful information on species relatedness. Technologies are needed to determine protein-protein interactions important for host-pathogen interactions. Our ability to map protein expression in relation to lifecycle and infectious stages as a route to finding target proteins important for pathogenicity needs to be improved. Additional molecular markers for fingerprinting pathogens are also needed.

Additional research on pathway, risk, vulnerability, forensic, and mitigation assessments is generally required. Research on disease mechanisms, host range, immunology, epidemiology and pathogenesis needs strengthening so that pathogens can continuously be studied or in case newly engineered pathogens appear. We need to develop and maintain an interactive database of information regarding crops and pathogens of agricultural importance so that information and data regarding possible threats can be easily shared.

Gaps exist in our technologies to effectively limit the spread of many plant diseases. We also need to improve our understanding of the long-term persistence and fate of various pathogens or contaminants and determine how various environmental factors and conditions affect establishment spread, and persistence of a threat in an agricultural context.

We need to address knowledge gaps identified by other agencies during their exercising of various disease dynamic and agricultural systems models that help identify potential nodes of bioterrorism attack on crops and likely impacts through time and space.

We need to improve our ability to provide policy decision-makers with relevant and timely research information. Finally, better technologies for screening germplasm for disease resistance is needed.

## HIGH PRIORITY RESEARCH NEEDS

The National Plant Disease Recovery System must be capable of responding to a high-consequence plant disease by implementing sufficient control measures and developing resistant seed varieties for economically important crops. Research is needed to discover and utilize naturally occurring and engineered genetic mechanisms for plant pathogen control and to develop genomic resources to identify genes that protect plants against disease. Researchers should be able to utilize and transfer these genetic resources for commercial use in the event of a devastating disease outbreak. To achieve these goals efficiently, the collection of genetic resources in the U.S. National Plant Germplasm System should be utilized to develop agronomic germplasm with effective and durable defensive traits.

Varieties and/or germplasm with significantly improved characteristics are needed to enhance disease resistance. Collections and databases of pathogens must be maintained and genetic resistance factors identified. A mechanism to easily access and share the information throughout the research community and by cooperating federal and State partners is needed. Genetic characterization of pathogens for fingerprinting and the assessment of genetic variability among pathogen isolates for forensics is a high priority. Improve methods for monitoring and mapping of disease incidents for predictive models of probable routes of entry into the United States are also needed. Effective and economically viable cultural, biological and chemical control strategies are needed for most of the priority pathogens.

Specific research needs should include a system to manage knowledge of host-pathogen interactions with a systematic centralized approach to deploy resistant plant resources. Monitoring and indexing crop diseases should be coordinated. Sources of genetic resistance should be identified by evaluating plant germplasm from the U.S. National Plant Germplasm System (NPGS) collection and international sources for resistance to diseases. Diseases for which existing germplasm stocks do not offer suitable candidate genes for potential incorporation into breeding programs should be identified so that new strategies for incorporating resistant genes from a wider range of sources through genetic engineering could be planned.

Genetic markers should be developed for disease resistance and genomic and proteomic research initiated to discover the biochemical or genetic mechanisms that affect control of resistance expression. A gene marker assisted breeding program and micro-arrays should be developed to expedite breeding of agronomic genotypes with multiple genes for resistance. Genetic diversity of pathogens must be assessed to evaluate potential evolution of new races.

Research should determine critical crop development stage for chemical and biological treatments including maintenance of databases of effective control strategies. Seed handling/storage techniques should be evaluated including possible seed treatments with fungicides/bactericides. Efficacy data should be developed to register fungicides for use on susceptible crops. Research on pathogen biology and host/pathogen interactions should be expanded which can be easily accessible by action and regulatory agencies. Integrated pest management approaches to control disease outbreaks are longstanding ARS strengths. Evaluation of biological and cultural control technologies and improvements in seed storage and handling will minimize impacts of threatening diseases.

Rapid identification of pathogens can prevent introduction of a foreign pathogen and subsequent spread of a disease. Improved detection methods based on DNA technology should be produced based on current technologies including modern molecular biological tools. They will provide a means to test crops for the presence of pathogens of regulatory significance.

## HIGH PRIORITY EDUCATION AND EXTENSION NEEDS

Every recovery program will require advance coordination with and assessment of personnel (capability) and skills-based infrastructure (capability/capacity). Where there are gaps in capacity and capability for surveillance, detection, diagnostics, and response extension, these gaps will require educational programs to correct the deficiency. In some cases, skills sets will be required for which there simply are not enough personnel and will require direction of resources into graduate or other appropriate programs such as 'Doctor of Plant Medicine' to build capacity and capability. In other cases, it may be a matter of reaching existing personnel with new messages and training modules to expand capabilities.

Once a foreign pathogen (or other biological invasive) has been detected and diagnosed, and surveillance has been mounted to determine extent and regional status of infection, response and recovery will kick in. Both of these have specific sets of educational and extension outreach components. The public needs to know some aspects, the agricultural industry (growers, advisors, commodity associations) will have other more specific information, and university extension specialists will need the most detailed information that research science can provide. The entire range of extension tools will be needed, from training of county extension trainers, to web- and media-based real time information dissemination. Messages to growers and crop advisors will need to be prepared ahead of time for high-priority pests and pathogens, and personnel need to be prepared and ready to participate in the Pest Information Platform for Extension and Education (PIPE), or a similar real-time outreach tool such as the Emergency Disaster Extension Network (EDEN).

For the effective response and recovery to any high consequence biological introduction into plant-based agriculture, the infrastructure provided by the land grant university cooperative extension service is essential. This service will need to be maintained at some optimum capacity in order to react quickly to response and recovery needs as they are defined.

## EMERGENCY AUTHORITIES

In addition to the emergency powers authorized by the Plant Protection Act of 2004, other legal authorities that may be utilized to facilitate response and recovery activities are identified in Attachment 4. In cases of widespread crop damage or loss, it may be in the national interest to provide interim support for farmers until they can resume production. Maintaining the resource management and production capability of farmers is an integral part of any recovery strategy. Depending on the circumstances of a disease outbreak, one or more of the following authorities may be needed to insure survival of a viable farming infrastructure either nationally or within a defined production region.

Attachment 1:

| TASK # | HSPD-9 PROVISION SUMMARY | USDA | OTHER PARTNERS |
|---|---|---|---|
| | **AWARENESS AND WARNING** | | |
| 8 | Build upon and expand current monitoring and surveillance programs to:<br><br>(a) Develop **surveillance and monitoring systems**, including international information, for animal, plant, and wildlife disease, and food, public health, and water quality that provides early detection and awareness;<br><br>(b) Develop **systems to track** specific animals and plants, as well as specific commodities and food; and<br><br>(c) Develop **nationwide, interconnected lab networks** for food, veterinary, plant health, and water quality that integrate existing Federal and State laboratory resources and utilize standardized diagnostic protocols and procedures. | APHIS, CSREES, FSIS, FNS and AMS | DHS, EPA, FDA, CDC, and DoD |
| 9 | Develop and **enhance intelligence operations** and analysis capabilities to detect and assess the threat focusing on the agriculture, food, and water sectors. | APHIS, FSIS, USDA/OIG | FDA, FBI, DHS, CIA, and DoD |
| 10 | Create **a new biological threat awareness capacity** that will enhance detection and characterization of an attack. DHS will submit a report on specific options for establishing this capability, including recommendations for its organizational location and structure. | APHIS, FSIS, FNS, AMS, CSREES, OCIO | DHS, HHS, EPA, VA, DoD, and CDC |
| | **VULNERABILITY ASSESSMENTS** | | |
| 11 | Expand and continue **vulnerability assessments** of the agriculture and food sectors that identify requirements of the National Infrastructure Protection Plan and shall be updated every 2 years. | APHIS, FSA, FSIS, FNS, ERS and AMS | DHS, FDA, Mexican Gov't, Private Sector |
| | **MITIGATION STRATEGIES** | | |
| 12 | 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. | FSIS, APHIS, ERS, and AMS | DHS |
| 13 | Build on existing efforts to expand development of **common screening and inspection procedures** for agriculture and food items entering the U.S. and maximize effective domestic inspection activities for food items. | FSIS | DHS |

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| **RESPONSE PLANNING AND RECOVERY** | | | |
| 15 | Develop a coordinated **agriculture and food-specific standardized response plan** to be integrated into the National Response Plan. This plan will ensure coordinated response to an agriculture or food incident, delineate roles of Federal, State, local, and private sector partners, and will address risk communication for the general public. | APHIS, AMS, FNS, FSIS | Agriculture, Public Health, and emergency management agencies |
| 16 | Enhance **recovery systems** that are able to stabilize agriculture 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. | FSIS and NRCS | EPA, FDA and DHS |
| 17 | The Secretary of Agriculture shall study and make recommendations to the Homeland Security Council for the use of existing, and the creation of new **financial risk management tools** encouraging self-protection for agriculture and food enterprises vulnerable to terrorism. | RMA and ERS | |
| 18 | Work with State and local governments and the private sector to develop:<br><br>a) A **National Veterinary Stockpile (NVS)** to respond to the most damaging animal diseases affecting human health and the economy and be capable of deployment within 24 hours of an outbreak.<br><br>b) **National Plant Disease Recovery System (NPDRS)** 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. | APHIS, ARS, OCE, RMA, ERS, OBPA, and NRCS | DHS and EPA |
| **OUTREACH AND PROFESSIONAL DEVELOPMENT** | | | |
| 19 | Establish an effective **information sharing and analysis mechanism** for agriculture and food. | CSREES, FSIS, FNS, and AMS | FDA and DHS |
| 20 | Support the development of and promote **higher education programs** for the protection of animal, plant, and public health. | APHIS, CSREES | |
| 21 | Support the development of and promote a **higher education program** to address protection of the food supply. | CSREES | |
| 22 | 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. | APHIS, FSIS and CSREES | |
| **RESEARCH AND DEVELOPMENT** | | | |
| 23 | Accelerate and expand development of current and new **countermeasures** against the intentional introduction or natural occurrence of catastrophic animal, plant, and zoonotic diseases. The | APHIS | DHS, FDA, USDA/ ARS, and AMS |

| | | | |
|---|---|---|---|
| | Secretary of Homeland Security will coordinate these activities. | | |
| **BUDGET** | | | |
| 24 | Develop a plan to provide safe, secure, and state-of-the-art agriculture **bio-containment laboratories** that research and develop diagnostic capabilities for foreign animal and zoonotic diseases. | APHIS, ARS and FSIS | |
| 25 | Establish university-based **centers of excellence** in agriculture and food security. | APHIS, ARS, CSREES, and FSIS | DHS |
| 26 | Submit to the Director of the Office of Management and Budget, concurrent with their budget submissions, an **integrated budget plan** for defense of the United States food system. | HSO | APHIS, DHS, HHS, and FDA |

Updated 5/11/2006
Approved by USDA-OHS

ATTACHMENT 2 Priority Plant Diseases

## SELECT AGENTS
## (American Phytopathological Society accepted names)

| Pathogen | Disease Name | Crop(s) affected |
|---|---|---|
| *Candidatus* Liberibacter africanus | Citrus greening or huanglongbing | citrus |
| *Candidatus* Liberibacter asiaticus | Cirus greening or huanglongbing | citrus |
| *Peronosclerospora philippinensis* | Philippine downy mildew | corn (maize) |
| *Ralstonia solanacearum*, race 3, biovar 2 | bacterial wilt (brown rot) | solanaceous plants |
| *Sclerophthora rayssiae* var. *zeae* | brown stripe downy mildew | corn (maize) |
| *Synchytrium endobioticum* | wart | potato |
| *Xanthomonas oryzae pv. Oryzicola* | bacterial leaf streak | rice |
| *Xylella fastidiosa* | citrus variegated chlorosis | citrus |

### WHEAT RUSTS

| | | |
|---|---|---|
| *Puccinia triticina* | Leaf Rust | Wheat, other cereals |
| *Puccinia graminis* | Stem Rust | |
| *Puccinia striiformis* | Stripe Rust | |

ATTACHMENT 3

Pathogen: *Candidatus* Liberibacter africanus and Liberibacter asiaticus
Crop: Citrus

| **Active Ingredient Primary Tradename(s)** | **Tolerance Citation** | **Registered for Citrus?** |
|---|---|---|
| **Oxytetracycline**<br><br>RG OTC 17WP, Cuprimicina-Agro, Mycoshield | 40 CFR '180.337 | No |
| **Ledermycin**<br><br>not registered | N/A | No |
| **Streptomycin**<br><br>Agri-Mycin 17, Streptomycin 17, Plantomycin, Fructocin, Cuprimicin, Streptrol, Bac-Master, Paushamycin, Agri-Mycin, Stress | 40 CFR '180.245 | No |
| **Chloramphenocol**<br><br>not registered | N/A | No |

Pathogen: Liberibacter infested *Psylla* (Disease Vector)
Crop: Citrus

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Citrus? |
|---|---|---|
| **Imidacloprid**<br><br>Confident, Confidential, Condor, Imidor, Titanic, Admire, Confidor, Gaucho, Genesis, Merit, Premier, Premise | 40 CFR '180.472 | Yes |
| **Fenpropathrin**<br><br>Forward, Sweprothrin, Sinopathrin, Fenthrin, Digital, Danitol | 40 CFR '180.466 | Yes |
| **Spiromesifen**<br><br>not registered<br>no tradename(s) listed | N/A | No |

Pathogen: leaf, stem, and stripe rusts
Crops: wheat, small grains

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Wheat and/or Small Grains? |
|---|---|---|
| **Azoxystrobin**<br><br>Heritage, Abound, Quadris | 40 CFR '180.507 | Yes |
| **Propiconazole**<br><br>Tilt, Orbit, Banner | 40 CFR '180.434 | Yes |
| **Difenoconazole**<br><br>Dividend, Bargos, Bogard, Geyser, Score, Sico | 40 CFR '180.475 | Yes |
| **Pyraclostrobin**<br><br>Insignia, Headline, Cabrio | 40 CFR '180.582 | Yes |
| **Tebuconazole**<br><br>Folicur, Elite, Raxil | 40 CFR '180.474 | Yes |

Pathogens: *Peronosclerospora philippinensis* and *Sclerophthora rayssiae* var. *zeae*
Crop: Corn (Maize)

| Active Ingredient<br>Primary Tradename(s) | Tolerance Citation | Registered for Corn/Maize ? |
|---|---|---|
| **Triphenyltin**<br><br>Super Tin | 40 CFR '180.236 | No |
| **Mancozeb**<br><br>Dithane M-45, Manzate 200, Fungizeb, Aimcozeb, Penncozeb, Tridex | 40 CFR '180.176 | Yes |
| **Fenaminosul**<br><br>not registered<br>Dexon | N/A | No |
| **Triforine**<br><br>Ortho Rose Disease Control, Denarin, Funginex, Saprol | 40 CFR '180.382 | No |
| **Metalaxyl**<br><br>Apron, Agrodomil, Ridosin, Metax, Eastaxyl | 40 CFR '180.408 | Yes |
| **Mefenoxam**<br><br>Ridomil, Subdue, Quell, Noxion, Rutel, Metalaxyl-M | 40 CFR '180.546 | Yes |
| **Chlorothalonil**<br><br>Daconil 2787, Bravo, Funconil, Clorto-B, Diatab, Balear, Teren | 40 CFR '180.275 | Yes |
| **Zoxamide**<br><br>Zoxium, Gavel | 40 CFR '180.567 | No |
| **Fosetyl-Al**<br><br>Aliette, Aglite, Chipco, Fosbel | 40 CFR '180.415 | No |
| **Cymoxanil** | 40 CFR '180.503 | No |

| | | |
|---|---|---|
| Curzate, Biozate, Vitene | | |
| **Dimethomorph**<br><br>Acrobat, Stature, Forum | 40 CFR '180.493 | No |
| **Propamocarb**<br><br>Tattoo, Previcur, Banol | 40 CFR '180.499 | No |
| **Azoxystrobin**<br><br>Abound, Amistar, Bankit, Heritage | 40 CFR '180.507 | Yes |

Pathogen: *Ralstonia solanacearum*, race 3, biovar 2
Crops: Solanaceous plants

| Active Ingredient<br>Primary Tradename(s) | Tolerance Citation | Registered for Solanaceous Plants? |
|---|---|---|
| **Chemical fumigation**B soil fumigation can reduce but not eliminate | | |
| **Muscodor albans**<br><br>Proposed Trade Name: Arabesque | Pending registration and tolerance exemption | On pending label |

Pathogen: *Xylella fastidiosa* (vector B glassywinged sharpshooter)
Crops: As noted below

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Crops? |
|---|---|---|
| **Imidacloprid**<br><br>Confident, Confidential, Condor, Imidor, Titanic | 40 CFR '180.472 | Citrus, grapes and most all other key host plants |
| **Cyfluthrin**<br><br>Cyfe, Safe, Laser, Tempo, Safer | 40 CFR '180.436 | Citrus and other crops |
| **Acetamiprid**<br><br>Assail, Intruder, Profil, Tri-Star | 40 CFR '180.578 | Citrus and other crops |
| **Bifenthrin**<br><br>Altar, Biflex, Brigade, Capture | 40 CFR '180.442 | Citrus and other crops |
| **Fenpropathrin**<br><br>Forward, Sweprothrin, Sinopathrin, Fenthrin, Digital | 40 CFR '180.466 | Citrus and other crops |
| **Kaolin**<br><br>Barden, Nuflo, Suprex, Crown Clay | 40 CFR '180.1180 | Apples, apricots, citrus, corn, cotton and other crops |
| **Sorbitol octenoate**<br><br>Avachem (registration pending) | | Wide variety of crops pending |
| **Sucrose octanoate**<br><br>Avachem | 40 CFR '180.1222 | Wide variety of crops |
| **Buprofezin**<br><br>Pilaud, Puslin, Tifezin | 40 CFR '180.511 | Citrus and other crops |
| | | |

| | | |
|---|---|---|
| **Pyrethrins**<br><br>Pyrkem, PyGanic, Chem Sect | 40 CFR '180.128 | Oranges, grapes and many other hosts plants |

Pathogen: *Xylella fastidiosa*
Crop: citrus

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Citrus? |
|---|---|---|
| None known | N/A | N/A |

Pathogen: *Xanthomonas oryzae* pv. *oryzicola*
Crop: Rice

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Rice? |
|---|---|---|
| **Copper oxychloride**<br><br>Coptox, Aviocaffaro, Neoram, COC, CO-TOX, Top Gun, Recop | 40 CFR '180.1021 | Yes |
| **Streptomycin**<br><br>Agri-Mycin 17, Streptomycin 17, Plantomycin, Fructocin, Cuprimicin, Streptrol, Bac-Master, Paushamycin, Agri-Mycin, Stress | 40 CFR '180.245 | No |
| **Bleaching powders**<br><br>not registered<br>no tradename(s) | N/A | No |

Pathogen: *Synchytrium endobioticum*
Crop: Potato

| Active Ingredient Primary Tradename(s) | Tolerance Citation | Registered for Potatoes? |
|---|---|---|
| **Muscodor Albans**<br><br>Proposed Trade Name: Arabesque | Pending registration | On pending label |
| Soil fumigation can reduce but not eliminate | N/A | |

Attachement 4: Emergency Authorities

Emergency Loans Consolidated Farm and Rural Development Act (7 U.S.C. 1921 et seq.) Authorizes direct and guaranteed loans to producers that have been substantially affected by a plant or animal health quarantine imposed by the Secretary of Agriculture due to a natural disaster, or a major disaster or emergency declared under the Stafford Act.

Section 32 Funds. Section 32 of the Act of August 24, 1935, authorizes the appropriation for each fiscal year of an amount equal to 30 percent of the gross receipts from duties collected under customs laws of the United States during the preceding calendar year. These funds are used to: encourage exports of agricultural commodities; encourage domestic consumption of such commodities; and to re-establish farmers' purchasing power. The Secretary has used discretionary authority to provide disaster assistance to producers economically impacted by events, primarily natural disaster events..

Extraordinary Contractual Actions Public Law 85-804 (50 U.S.C. 1431-1434), Executive Order 10789, and FAR Part 50

Authorizes the President to authorize any department or agency which exercises functions related to national defense acting in accordance with regulations and for protection of the Government, to enter into, amend, or modify contracts, and make advance payments on contracts, without regard to other provisions of procurement law, whenever he deems such actions would facilitate the national defense. The President has delegated that authority to the Secretary of Agriculture, and other government agencies, in Executive Order 10879.

Regulations governing exercise of this authority are set forth in Federal Acquisition Regulation (FAR) Part 50, and USDA regulations regarding this authority are set forth in Agriculture Acquisition Regulation (AGAR) Part 450. Under those regulations, the USDA Assistant Secretary for Administration (ASA) is the final authority authorized to approve all actions under FAR Part 50, except for contractor indemnification actions, which must be approved by the Secretary. The FAR sets forth a number of restrictions on actions that can be taken under this authority. In particular, there are dollar thresholds: actions authorized by the ASA essentially are limited to those involving a dollar value of $50,000, and no action (aside from indemnification agreements) can be taken that would obligate the government for more than $25 million unless Congress is notified and has had 60 days of continuous section to act.

Sole Source and Restricted Competition Procurement Authorities 41 U.S.C. 253(c) and FAR 6.302-2 and FAR 6.303-3

Federal procurement law, as implemented in the FAR, authorizes agency contracting officers to contract without full and open competition under certain circumstances.

FAR 6.302-2 provides authority for a sole source procurement or restricted competition where an agency need for services or supplies is of such an unusual and compelling urgency that the Government would be seriously injured unless the agency was permitted to limit competition. Agencies are still required to request offers from as many sources as is practicable under the circumstances. A determination to use this authority

must be justified and approved in writing in accordance with the FAR, but the required justifications may be done after award where preparation prior to award would unreasonably delay the acquisition. A class justification and approval may be issued in the event of a national emergency, as was done by USDA Senior Procurement Executive Russ Ashworth following the President's declaration of a national emergency on September 14, 2001.

FAR 6.302-3 provides authority for a sole source procurement or restricted competition to maintain a facility, producer, manufacturer, or other supplier available for furnishing supplies or services in case of a national emergency or to achieve industrial mobilization. FAR 6.302-3(b)(1) describes a variety of situations justifying use of this authority. A determination to use this authority must be justified in writing in accordance with the FAR.

The trigger is an unusual and compelling urgency for services or supplies or a need to maintain a facility, producer, manufacturer, or supplier for national emergency or industrial mobilization purposes.

The Defense Production Act (DPA) authorizes the President to take a number of actions to promote national defense, and to prioritize private sector production of materials, and performance of contracts, to promote the national defense. "National defense" is defined to include "emergency preparedness" activities under the Stafford Act which, in turn, includes both emergency preparedness and response. Per executive order delegation, the Secretary of Agriculture has certain delegated authority under the DPA with respect to food resources including seed, food resource facilities, and the domestic distribution of commercial fertilizer. Currently the Department maintains six Defense Food Orders one of which impacts the distribution of seed. The DFO reads in part:

> The purpose of this Order is to control the distribution and use of seed whenever it is determined that the seed is or may become in critically short supply. The Order States the basic rules governing the restrictions on the distribution and use of seed. It authorizes the Order Administrator to control distribution and use of seed and to issue suborders restricting distribution and use thereof. The policy of USDA shall be to administer this order, insofar as feasible, so as to minimize the effect of the restrictions of the Order upon the normal distribution of seed in trade channels.

The DFO's are being revised to parallel industry standard priority rating on contracts and orders, which can be expanded to include all needed resources in a significant event.

Under consideration are regulations which parallel the Department of Commerce in which persons receiving rated orders for supplies or services must accept and fill the order ahead of any existing unrated or lower rated orders it may have, including rescheduling unrated or lower rated orders where necessary. Persons who receive rated orders must in turn place rated orders with their suppliers for items required to meet the demands of the rated order. Thus, a rated order proceeds from the prime contractor, to the subcontractor(s), and then to the supplier(s).

Departmental regulations, when written, will provide that in the event of a national emergency the published regulation may be supplemented with special "allocation rules" that require producers of critical and scarce items to set aside production capacity in

anticipation of receipt of government orders, to produce items in accordance with a production schedule issued by the government, and to adhere to an allotment for the maximum quantity of an item authorized for use in a specific program or application. If critical items become scarce, such that defense and national security needs of the government cannot be met without creating a significant dislocation in the civilian market so as to create appreciable hardship, the regulation will provide that Agriculture may establish special rules under section 101(b) of the DPA to control the general distribution of such items in the civilian market. In the even of a catastrophic national security event in which contact with Washington is cut off, the regulations provide for exercise of the regulation by State Emergency Boards (proposed).

Noninsured Crop Disaster Assistance Program

The Noninsured Crop Disaster Assistance Program (NAP) provides financial assistance to eligible producers affected by natural disasters. The federally funded program covers noninsurable crop losses and planting prevented by disasters. Eligible crops include commercial crops (including seed) and other agricultural commodities produced for food (including livestock feed) or fiber for which the catastrophic level of crop insurance is unavailable.

To receive a benefit, a natural disaster must reduced the producer's expected unit production of the crop by more than 50 percent; or prevented you from planting more than 35 percent of your intended crop acreage. NAP covers the amount of loss greater than 50 percent of your expected production, based on your approved yield and reported acreage. A payment factor reflecting the decreasing cost incurred in the production cycle for the crop that is harvested, unharvested, or prevented from being planted

Crop Insurance

Crop Revenue Coverage (CRC)
The most widely available revenue protection policy is CRC. This policy guarantees an amount of revenue based on the time generated price (base price) or the harvest-time generated price (harvest price). While the guarantee may increase, the objective of CRC, it contains provisions addressing both yield and price risks. CRC covers revenue losses due to a low price that is less than the final guarantee for the crop acreage.

Group Risk Income Protection (GRIP)
GRIP is the newest revenue product to come along. GRIP is based on the experience of the county rather than individual farms, so APH is not required for this program. A GRIP policy includes coverage against potential loss of revenue resulting from a significant reduction in county yield or commodity price of a specific crop. When the county yield estimates are released, the county revenues (or payment revenues) will be calculated prior to April 16 of the following crop year. GRIP will pay a loss when the county revenue is less than the trigger revenue. Since this plan is based on county revenue and not individual revenue, the insured may have a loss in revenue on their farm and not receive payment under GRIP. Beginning with the 2004 crop year, the GRIP Harvest Revenue Option (HRO) Endorsement is available. This optional endorsement offers "upside" price protection by valuing lost bushels at the harvest price in addition to the coverage offered under GRIP.

Group Risk Plan (GRP)
Like GRIP, GRP coverage is based on the experience of the county rather than individual farms, so APH is not required for this program. GRP indemnifies the insured in the event the county average per-acre yield or payment yield falls below the insured's trigger yield. The Federal Crop Insurance Corporation (FCIC) will issue the payment yield in the calendar year following the crop year insured. Since this plan is based on county yields and not individual yields, the insured may have a low yield on their farm and not receive payment under GRP.

Income Protection (IP)
IP is a revenue product that, based on the individual producer's APH, protects against a loss of income when prices and/or yields fall. While IP looks a lot like CRC, it does not have the increasing price function of CRC. The guarantee and the premium will be calculated using the spring-time generated price (projected price). An indemnity is due when the revenue to count (production to count x harvest price) is less than the amount of protection.

Multiple Peril Crop Insurance (MPCI)
MPCI is the oldest and most popular product to make this list. As the name implies, MPCI provides protection against a loss in yield due to nearly all natural disasters. For most crops, that includes drought, excess moisture, cold and frost, wind, flood and unavoidable damage from insects and disease. MPCI guarantees a yield based on the individual producer's APH. If the production to count is less than the yield guarantee, the insured will be paid a loss.

Revenue Assurance (RA)
The coverage and exclusions of RA are similar to those for the standard MPCI policy. However, MPCI provides coverage for loss of production, whereas RA provides coverage to protect against loss of revenue caused by low prices or low yields or a combination of both. RA has the Fall Harvest Price Option (FHPO) available. This Option uses the greater of the fall harvest price (harvest-time generated price) or the projected harvest price (spring-time generated price) to determine the per-acre revenue guarantee. So, with the Option, RA works like CRC, without the Option, it works like IP. RA protects a producer's crop revenue when the crop revenue falls below the guaranteed revenue.

Federal Seed Act

This Act provides the Secretary with specific authority to relax labeling requirements due to "an emergency beyond human control" that prevents the collection of certain information about the germination of seeds which in turn cannot be provided prior to transport. No definition of "emergency" is found within the act.

International Forestry Assistance

The Secretary may provide assistance that promotes sustainable development and global stability, including natural disaster planning and response and disease, pest, and damaging agents control.

Assistance in Emergency Forest Insect and Disease Epidemics

Section 8(b)(3) of the Cooperative Forestry Assistance Act of 1978, as amended (16 U.S.C. 2104(b)(3)). The Secretary of Agriculture may, directly on the National Forest System, in cooperation with other Federal departments on other Federal lands, and in cooperation with State officials, and other entities on non-Federal lands, plan, organize, direct, and perform measures to prevent, retard, control, or suppress emergency insect infestations and disease epidemics affecting trees.

Invasive Species Control and Management

Section 15 of the Federal Noxious Weed Act of 1974 (7 U.S.C. 2814); Section 8 of the Cooperative Forestry Assistance Act of 1978, as amended (16 U.S.C. 2104); Section 5 of the Public Rangelands Improvement Act of 1978 (43 U.S.C. 1904(c)); Section 401 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1751); Section 3 of the Hawaiian Tropical Forestry Recovery Act (16 U.S.C. 4502a); Section 602(b)(1) of the International Forestry Cooperation Act of 1990 (16 U.S.C. 4501 (b)(1)); and the Forest and Rangeland Renewable Resources Research Act of 1978. The Secretary of Agriculture is authorized under the cited statutes to prevent the introduction of, respond rapidly to, and control and manage invasive species on Federal and non-Federal lands.

Emergency Conservation Program provides emergency cost-share funding for farmers and ranchers to rehabilitate farmland damaged by natural disasters that create new conservation problems which, if not treated, would:

- Impair or endanger the land;
- Materially affect the productive capacity of the land;
- Represent unusual damage, which is not the type likely to recur frequently in the same area; and
- Be so costly to repair that Federal assistance is or will be required to return the land to productive agricultural use.