

HIGH CONSEQUENCE PLANT DISEASES/ PESTS AND YOUR CROPS

Biological Emergencies



Crop diseases and pests (insects, mites, weeds, and vertebrates) are one of the top concerns for any farmer. Some of these are of special concern based on their ability to spread rapidly, cause severe disease in plants and devastating economic losses. These high consequence diseases include emerging, and “exotic” or foreign diseases of plants. Prevention and rapid detection are essential for minimizing the impact to your crops.

Definitions

- **Emerging Diseases:** Diseases or pests that are newly discovered, have increased in occurrence or have spread to new locations. Examples include: soybean rust, the emerald ash borer.
- **“Exotic” or Foreign Animal Diseases:** Diseases or pests not currently found in the U.S., but are present in other areas of the world, thereby making them a potential biological threat to U.S. crops and plants. Examples include: bacterial wilt, brown striped downy mildew.
- **Information on high consequence plant diseases can be found at** http://www.aphis.usda.gov/plant_health/plant_pest_info/index.shtml

Pest Detection

Most plant pest introductions occur accidentally as a result of increased global travel and trade. Federal and State agencies work together to promptly detect any high consequence plant diseases or pests. These include the USDA Plant Protection and Quarantine, the Department of Homeland Security, the National Plant Diagnostic Network, and others.

- **Additional information on these and other program can be found at** http://www.aphis.usda.gov/plant_health/index.shtml
- **To find recent exotic pest detection news for your state, go to** <http://pest.ceris.purdue.edu/stateselect.php>.

Pest Management and Control

Pest management involves measures to reduce pest population or to reduce their harmful effects. Management techniques can be classified into these different categories.

- **Chemical controls.**
 - Immediate and temporary elimination of localized pest populations using chemical pesticides.
- **Cultural controls.**
 - Farming practices that make the environment less favorable to pests. Examples include: crop rotation, tillage, plant density, timing of harvest, and water management.

- **Biological controls.**
 - Biological controls are natural methods of pest management. Predators (e.g., wasps, lacewings, lady beetles), parasites, competitors, and antagonistic microorganisms all fall under the category of biological controls.
- **Integrated pest management.**
 - Involves diverse methods of pest controls, paired with monitoring to reduce unnecessary pesticide applications; the use of pesticides in combination with other crop management approaches.

Emerging Crop Diseases

New infectious plant diseases and pests are emerging all the time. It is important to stay informed about these threats and know what to look for. Some of the recently significant diseases can be found on the table on the next page.

Regional and national pest alerts can be found at http://www.csrees.usda.gov/nea/pest/in_focus/ipm_if_pestalert.html.

Prevention: Crop Biosecurity Measures

- **Monitor plants for signs of disease.**
 - Routinely inspect your fields for signs of disease or pests.
 - Wear clean shoes and clothing when walking between fields, greenhouses, etc.
- **Restrict access to your farm.**
 - Only allow essential workers and vehicles on your farm.
 - Minimize vehicle traffic on your land, especially near fields.
 - Do not allow new or foreign plants to be brought onto your property.
- **Cleaning and disinfection.**
 - Clean and disinfect clothes, shoes, equipment, vehicles and hands after contact with plants.
 - Make sure tools are cleaned between fields/greenhouses, or have separate sets for each.
 - Do not share equipment with other farms, unless items have been cleaned and disinfected.
- **For additional biosecurity measures to implement, visit** <http://ipmworld.umn.edu/chapters/ferro.htm>.

Development of this educational material was by the Center for Food Security and Public Health with funding from the Multi-State Partnership for Security in Agriculture MOU-2010-HSEMD-004. June 2010



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These diseases or pests are considered high consequence or emerging due to their ability to spread rapidly, cause severe damage to crops or plants, or have severe economic impacts.

Disease Name and Agent	Characteristics
Bacterial Wilt <i>Ralstonia solanacearum</i> Race 3	<ul style="list-style-type: none"> Bacterial disease of geraniums, potatoes, eggplant, tomato Considered potential plant agroterrorism agent Found in Europe, Asia, South and Central America, Australia Has occurred in U.S. (2004) but was eradicated
Brown Striped Downy Mildew <i>Sclerophthora rayssiae</i> var. <i>zeae</i>	<ul style="list-style-type: none"> Fungal disease of corn Reduces production by damaging leaves Currently found in Asia
Philippine Downy Mildew <i>Peronosclerospora philippinensis</i>	<ul style="list-style-type: none"> Fungal disease of maize and corn; can also affect sugarcane, some sorghum, and grass species Found in parts of Asia and Africa
Soybean Rust <i>Phakopsora pachyrhizi</i>	<ul style="list-style-type: none"> Fungal disease of soybean, kudzu, lupine, common bean, vetch, clover, cowpea, sweat clover, medic Confirmed in continental United States in November 2004
Soybean Aphid <i>Aphis glycines</i> Matsumura	<ul style="list-style-type: none"> Insect that infests soybeans Found in several states of the United States, including Midwestern states Damages soybean leaves, stems, and pods Reducing production, stunting, can kil plants. Aphids can also transmit a number of soybean viruses, such as soybean mosaic, alfalfa mosaic, and others.
Emerald Ash Borer <i>Agrilus planipennis</i> Fairmaire	<ul style="list-style-type: none"> Insect that damages and kills ash trees Confirmed in U.S. in 2002; now found in 14 Midwestern states For more information, http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/index.shtml and http://www.emeraldashborer.info/
Asian Longhorned Beetle <i>Anoplophora glabripennis</i> Motschulsky	<ul style="list-style-type: none"> Insect that burrows in deciduous hardwood trees (maple, boxelder, birch, horse chestnut, poplar, willow, elm) eventually killing them Confirmed in northeastern U.S. in 2007; eradication efforts are underway For more information, http://www.aphis.usda.gov/newsroom/hot_issues/alb/alb_general_info.shtml and http://beetlebusters.info/

For additional plant pathogens of concern:

North Central Integrated Pest Management (USDA CSREES). Pest Alerts from the North Central Region.

<http://www.ncipmc.org/alerts/index.cfm>

National Cooperative Agricultural Pest Survey Target Species Listing at

<http://www.invasive.org/species/list.cfm?id=13>

USDA APHIS Regulated Pest List at <http://www.invasive.org/species/list.cfm?id=4>