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Plant Pathology Fact Sheet

Landscape Sanitation

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Importance of Sanitation

Diseases can become a significant problem in commercial and home landscape plantings (Figure 1A), resulting in premature leaf drop, dieback, decline, and even plant death. When diseases do occur, it is often presumed that fungicides are the most important and effective disease management tools available. However, a good sanitation program can help reduce the need for chemical controls and can improve the effectiveness of other practices for managing disease. This often-overlooked disease management tool reduces pathogen numbers (Figure 1B) and eliminates infective propagules (inoculum such as fungal spores, Figure 1C; bacterial cells; virus particles; and nematode eggs) that cause disease.

For example, certain foliar fungal and bacterial leaf spots can become prevalent during rainy or humid growing seasons. When disease management is neglected, pathogen populations build-up and continue to increase as long as there is susceptible plant tissue available for infection and disease development. Infected plant tissue infested soil, and pathogen inoculum all serve as sources of pathogens that can later infect healthy plants.

Figure 1. When marigold blossoms infected with Botrytis are left in the landscape (**A**) pathogen levels build up on diseased tissues (**B**), resulting in the production of numerous additional infecting spores (**C**).

Figure 2. Fallen leaves can serve as a source of inoculum (fungal spores) for additional infections. Many pathogens overwinter in fallen debris and then produce infective spores the following spring.

Reduction of pathogens by various sanitation practices can reduce both active and dormant pathogens. While actively growing plants can provide host tissue for pathogen multiplication (Figure 1), dead plant material (foliage, stems, roots) can harbor overwintering propagules for months or years (Figure 2). These propagules can travel via air/wind currents, stick to shoes or tools, or move with contaminated soil or water droplets. Thus, prevention of spread of pathogens to healthy plants and the elimination of any disease-causing organisms from one season to another are the foundations for a disease management program using sanitation practices.

Sanitation Practices

Elimination and/or reduction of pathogens from the landscape results in fewer pathogen propagules. The following sanitary practices can reduce amounts of infectious pathogens:

- Remove diseased plant tissues from infected plants. Prune branches with cankers well below the point of infection (Figure 3). Cuts should be made at an intersecting branch. Rake and remove fallen buds, flowers, twigs, leaves, and needles (Figure 4).

- Disinfest tools used to prune galls and cankers. Cutting blades should be dipped into a commercial sanitizer, 10% Lysol disinfectant, 10% bleach, or rubbing alcohol between each cut. If using bleach, rinse and oil tools after completing work, to prevent corrosion.

- Discard perennial and annual plants that are heavily infected and those with untreatable diseases (e.g. root rots, Figure 4; and vascular wilts). Dig infected plants to include as much of the root system as possible, along with infested soil.

- Trees and shrubs infected with systemic diseases (e.g. Dutch elm disease, Verticillium wilt, bacterial leaf scorch) that show considerable dieback should be cut and the stump removed or destroyed (e.g. by grinding).

- If infected plants are to be treated with fungicides, prune or remove infected tissue (flowers, leaves) and debris to eliminate sources for spore production or propagule multiplication. This should be done before fungicide application. Fungicide effectiveness may be reduced when disease pressure is heavy, which can result when pathogen levels cannot be reduced sufficiently by chemical means (fungicides).

Figure 3. Cankers are common overwintering sites for disease-causing pathogens. Remove infected branches, making cuts well below points of infection.

Figure 4. Heavily infected plants or those with untreatable diseases, such as black root rot (above), should be removed from the landscape.

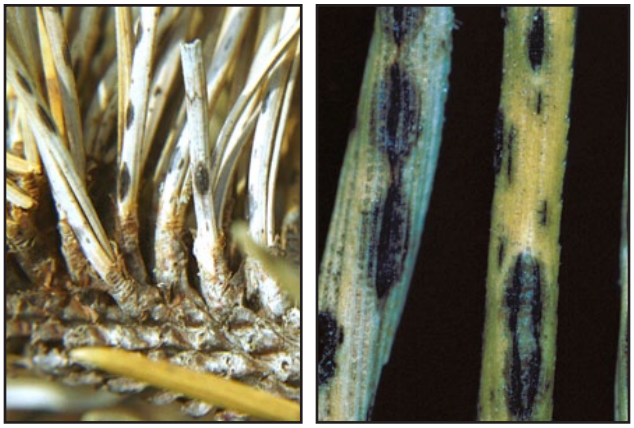

Figure 5. Black fruiting structures of the pine needlecast pathogen contain spores. Removal of infected plant tissue helps reduce amounts of inoculum in the landscape

- Discard fallen leaves, needles (Figure 5), prunings, and culled plants. Never leave diseased plant material in the landscape, as pathogens may continue to multiply by producing spores or other propagules. Infected plant material should be buried, burned, or removed with other yard waste.

- Do not compost diseased plant material or infested soil because incomplete composting (temperatures below 160˚ F) may result in survival of propagules.

- Homeowners should be cautious about storing diseased limbs and trunks as firewood or using the woodchips as mulch. For example, wood from trees infected with Dutch elm disease should be debarked before placing in a firewood pile.

- Remove weeds and volunteer plants to prevent establishment of a "green bridge" between plants. A green bridge allows pathogens to infect alternate hosts until a more suitable one becomes available. Be sure to remove aboveground parts AND roots.

- Soil from container-grown plants should not be reused from one season to the next because pathogens can survive in soil.

Additional Resources

- Extension Plant Pathology Publications
http://www2.ca.uky.edu/agcollege/plantpathology/extension/pubs.html

Reviewed by Paul Vincelli, Extension Plant Pathologist **Issued July 2013**

Photos by R.K. Jones, North Carolina State University (Fig. 1A), M.C. Shurtleff, University of Illinois (Fig. 1B), David Cappaert, Michigan State University (Fig. 1C), Theodor D. Leininger, USDA Forest Service (Fig. 2), Joseph O'Brien, USDA Forest Service (Fig. 3, right), Elizabeth Bush, Virginia Tech (Fig. 4, left), Bruce Watt, University of Maine (Fig. 4, right), Andrej Kunca, National Forest Centre, Slovakia (Fig. 5, left), Robert L. Anderson, USDA Forest Service (Fig. 5, right), courtesy Bugwood.org; and John R. Hartman, University of Kentucky (Fig. 3, left)