EXTENSION PROGRAM
ALCORN STATE UNIVERSITY

CONTROLLING PLANT DISEASES

A Quick Reference Source

Plant diseases are caused by *plant parasites or pathogens*, which include four types of organisms: **fungi, bacteria, nematodes, and viruses**. Fungi and bacteria thrive in warm, moist conditions and are most common when rain showers or heavy dews are frequent and temperatures are warm. Nematode damage is more evident in dry conditions, whereas viral diseases can occur at any time.

Methods of Control

Site selection

A home garden site should be well drained. Avoid wet and poorly drained soils. Excessive soil moisture will favor root and crown diseases such as damping-off as well as crown and root rots caused by fungal soil-borne pathogens. Most vegetables require full sunlight for maximum yield and drying of the foliage.

Crop rotation

Continuous plantings of vegetables within the same plant family provide opportunities for pathogen buildup. Do not plant the same family of vegetable in the same areas year after year. Grow the same plants or closely related plants in the same soil only once every 3 to 5 years. This practice starves out most pathogens that cause stem and leaf diseases.

Diseases Free Seed and Transplants

Many plant diseases can be seed-borne. Do not save seeds from year to year. This is important to prevent a number of diseases, including halo blight, common blight, anthracnose of snap beans, and bacterial spot of tomatoes. When starting a crop from transplants, seedlings should be examined carefully for disease symptoms before purchasing.

Use Resistant Varieties

Using resistant varieties is the most efficient way of controlling vegetable diseases. Make an effort to buy resistant varieties when they are available. Seed catalogs generally list resistant traits of the various vegetable varieties.

Planting Date Management

The selection of planting date can be an effective tool for disease management. Follow the recommended planting dates for the particular vegetable grown. For example, warm-season crops should be planted when soil temperatures are warm for good germination and growth. Planting these crops when soil temperatures are cool can cause increased incidence of soil-borne diseases.

Trap Crops

Using trap crops helps manage virus diseases and aphid populations. A few rows of a trap crop (such as rye or corn) around the vegetable garden will cause aphids to feed there first, possibly loosening the virus they may carry. Trap crops can limit aphid damage and help reduce the incidence of virus diseases.

Proper Spacing and Trellising

Space plants properly to allow growth and air circulation. Staking or trellising prevents soil contact with the foliage and fruit, reducing the incidence of diseases such as fruit rots. Trellising also promotes foliage drying, discouraging the growth of pathogens.

Use a Mulch Layer
Mulching prevents soil from splashing onto plants and also fruit from touching the bare ground. This will help prevent rots on mature fruit. Mulches also are a sound cultural practice to help conserve soil moisture and reduce weed infestations.

Proper Fertilization
Proper fertilization helps prevent vegetable diseases. Test soil 3 to 6 months before the growing season, and follow the recommendations to supply appropriate nutrient requirements and adjust soil pH. Proper pH prevents blossom end rot and encourages healthy growth of tomatoes and peppers.

Weed Free Garden
Weeds can serve as virus reservoirs for several insect-transmitted viruses that can infect homegrown vegetables. Good weed control will increase air movement and decrease conditions – such as excessive moisture – that favor disease development.

Avoid Tobacco When Working in the Garden
If you use tobacco, wash your hands thoroughly before handling plants. This practice will prevent the spread of tobacco mosaic virus, which can infect many different kinds of vegetables, particularly solanaceous crops (plants related to the nightshade family) such as tomatoes and peppers.

Nematode Control
Nematodes are microscopic, soil-inhabiting roundworms that injure vegetables and other plants by feeding on their root systems, causing decay or galling. Soil solarization can be used to reduce the number of nematodes present. This involves tilling the garden and then covering the areas with a clear plastic tarp for 6 to 8 weeks. The best time to solarize soil is June through August, when temperatures are at their hottest. Soil solarization requires intense solar heat to be effective.

Sanitation
After harvest, remove and destroy plant material. Plow the soil to help break down debris that may harbor nematodes, fungi, and bacteria. Plant refuse may also be plowed under. Remove diseased plants, plant residue, and weeds in and around the vegetable garden to reduce the occurrence of some diseases.

Pesticide Use
Pesticides should be the last defense used by home gardeners once all other disease-control options have been exhausted. Home gardeners have access to few fungicides or bactericides compared to commercial growers.

Chlorothalonil (Bravo ® or Daconil ®), maneb, mancozeb, Terraclor ® (PCNB), sulfur, and copper products can be used on certain crops. These products provide disease suppression across a range of foliar diseases and are more effective if they are applied in a preventive manner at the very onset or before a disease outbreak occur. Terraclor is used as a transplant soil drench to suppress Southern blight and Rhizoctonia damping-off. Copper products suppress fungi but primarily reduce losses to bacterial pathogens. Sulfur is suppressive to fungi and is especially effective against powdery mildews. As with any pesticide, read the label and follow the recommended precautions to ensure the chemical is applied in a safe, effective manner.

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