Horticulture Diagnostic Laboratory

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Minimizing Vegetable Disease

To grow a healthy vegetable garden, one with few or no diseases, some general practices should be used. The following **ten** steps will maintain healthy plants and reduce the need for fungicides. You may be able to devise others which are especially suitable to your garden.

1. CHOOSE RESISTANT OR TOLERANT VARIETIES:

The easiest and most important way to manage plant diseases is to choose resistant or tolerant varieties. The letter abbreviations used to describe the resistance of a variety (for example, VF = Verticillium and Fusarium wilt resistant, PM = powdery mildew resistant or tolerant) are listed in seed catalogs or can be explained by your County Cooperative Extension Agent. Resistant varieties resist infection by a particular disease agent and show little or no disease. Tolerant varieties may show symptoms but still yield the same as resistant varieties or susceptible ones protected with pesticides. When available, choose varieties that are resistant or tolerant to a disease that previously has been a problem.

2. PURCHASE SEED TREATED WITH FUNGICIDES AND INSECTICIDES:

Seed may come pre-treated with a dusting of a fungicide or an insecticide. This coating will help prevent the seed from rotting in the soil prior to germination and can also help protect the newly emerging seedling from "damping off". If seed rot or damping off have been problems in your garden, then using seed treated with a fungicide may be helpful.

3. PURCHASE DISEASE-FREE SEED, TRANSPLANTS, PROPAGATING MATERIAL:

Begin with healthy plant material to help plants become quickly established in the garden. Plant materials that are unhealthy at the start never yield as much as healthy ones or may die while still young. Reputable seed companies sell only disease-free plant materials. Some seeds are hot water treated to kill infectious agents such as spores or bacteria that may be carried on the seed coat.. Some are tested to reduce the risk of seed-borne viruses. When shopping for transplants or other propagating material, take time to thoroughly examine the plant stock to make sure it is healthy and vigorous. If you save your own seed, harvest it from healthy plants and dry it thoroughly. Store such seed in properly labeled airtight containers in a cool, dry place.

4. SELECT A SUNNY, WELL-DRAINED LOCATION:

A sunny area with well-drained soil is an ideal site for vigorous growth of garden plants. Shaded, poorly drained areas support weak and spindly plants that are easy targets for disease organisms. Even if such plants remain alive and free of infectious disease, they will not yield as much as strong and burly plants.

5. IMPROVE THE SOIL ENVIRONMENT:

When there is no other choice for a garden site but a heavy, wet soil, plant in raised beds or ridged rows so the soil around the plants' roots will be drier. Heavy wet soils discourage healthy root growth and encourage root rots. When a garden is established on sloped terrain, plant in terraced beds to reduce soil erosion over delicate, young plants and newly sown seed. Soils that are dry and sandy may be mulched with a variety of materials (straw, grass clippings, black plastic, etc.) to help retain moisture. A soil environment that is favorable to healthy root development will support the growth of healthy plants.

6. WATER AND FEED PLANTS:

Most plants in the Northeastern U.S. require one inch of rainfall per week for best growth. If rainfall is inadequate, water the garden. Water plants in the morning so they will dry off quickly above ground, reducing the chances of sprading diseases. Also avoid using overhead or sprinkler irrigation because it can promote the development and spread of leaf, flower, and fruit infections. Trickle irrigation is best because it puts water directly in the root zone, does not wet the plants above ground, nor encourage soil splashing. Plants that are fertilized properly at planting time and later as a sidedress will

grow better and healthier. Always use a complete fertilizer or incorporate a well-rotted manure or rich compost into the soil. Avoid over-fertilization because this will injure plant roots directly.

7. SPACE PLANTS TO ALLOW AIR CIRCULATION:

High humidity and moisture favor the development of diseases. Allowing enough room for plants to grow and space for air to circulate around mature plants reduces the humidity and promotes rapid drying of plant surfaces. This in turn helps reduce disease incidence.

8. PRACTICE CLEANLINESS IN THE GARDEN:

Always remove from the garden area plant materials that show signs of a disease and destroy them or place them in the trash. Work in the garden when plants are dry because moisture on plants aids the spread of infectious diseases. Composting, unless the pile becomes very hot, does not effectively eliminate most pathogens from plant refuse under New York climate conditions. For this reason it is unwise to compost diseased plant material. At the end of the growing season clean up all crop debris because disease agents may overwinter in this plant material and infect new plants the following season.

9. PLANT A FALL COVER CROP AND PLOW IT IN THE FOLLOWING SPRING:

After cleaning up the garden, sow a grass, like perennial rye, which will begin to grow that fall. This cover crop will protect the top soil from erosion during the winter months. The following spring plow in the rye grass to enrich the soil with fresh organic matter or "green manure". This practice also helps reduce the populations of certain soil-borne disease agents. Other, non-infectious, agents flourish on the green manure in the soil and tend to inhibit the infectious ones.

10. ROTATE CROPS:

Successive planting of one crop family in the same area over many seasons promotes the buildup of disease agents in the soil. Thus, disease becomes more severe over time. Rotate plants to different areas of the garden to help reduce the losses due to soil-borne disease agents. Avoid successive planting within crop families or crop types such as crucifers (cabbage, broccoli, turnip, radish, etc.), cucurbits (melon, cucumber, squash, etc.), solanaceous (tomato, eggplant, potato, pepper), grasses (sweet corn, cover crops such as rye), legumes (bean, pea), and root crops (carrot, beet, onion).

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