

LD  
5655  
A761  
M1159  
no. 362  
C. 2

# virginia home food production



## FACT SHEET

V.P.I. & S.U. LIBRARY

Reprinted January 1981

MAR 6 1981

MH 362

### IDENTIFICATION OF VEGETABLE DISEASES BLACKSBURG, VIRGINIA

Diseases of vegetable plants are caused by pathogenic fungi, bacteria, viruses and nematodes. They are usually identified by the symptoms and signs that they cause on susceptible host plants. Symptoms of plant diseases may be seen on a portion of an affected plant or the entire plant. Terms like wilt, blight, dieback, canker, crown gall, mosaic, leaf spot, powdery mildew, rust, smut and root rot are used to describe the symptoms. Occasionally, fungi such as mushrooms, powdery mildew, rust, smut and fruiting bodies of certain other fungi are readily visible or may be seen with low magnification, like a hand lens.

#### Diagnosis of Disease

1. Attempt to decide whether the disease is caused by a plant pathogen or instead is a physiological disorder.
2. If only the edge or margins of the diseased leaves are affected, examine other portions of the affected plant. Marginal browning of leaves frequently indicates that the roots or the main stem are affected. In addition, the plant may be showing symptoms of a mineral deficiency or excess.
3. Attempt to eliminate plant injury caused by mechanical agents, pests or animals.
4. With a soil auger or soil tube examine the soil below the roots of the affected plant for possible water-logged soil or a layer of rock or

very heavy soil.

5. If certain individuals of a given specie or cultivar are affected and others are not, look into the possibility of over-fertilization, improper application of pesticides or other unusual treatments.
6. If plants of several different families or genera are all showing similar symptoms, consider the possibility of improper pesticide application, improper or excessive fertilizer application or air pollution.
7. Examine all parts of the plant including leaves, stems and roots. Frequently symptoms observed in the top are the result of damage or disease of the roots. If a small sample of roots washed in water is collected from the affected plant and compared with a similar root sample from a healthy plant of the same variety, it may be possible to visually identify a root rot. Frequently, however, positive diagnosis of the cause of root rot or root damage requires laboratory culturing for fungi and nematodes and soil analysis in a soil testing laboratory.

#### Diagnosis of Plant Diseases

The diagnosis of diseases should be undertaken in a well organized logical manner. The following suggestions are intended to provide a framework to be used in the diagnosis of plant diseases.

Virginia Cooperative Extension Service programs, activities, and employment opportunities are available to all people regardless of race, color, religion, sex, age, national origin, handicap, or political affiliation. An equal opportunity/affirmative action employer.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, and September 30, 1977, in cooperation with the U. S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061; M. C. Harding, Sr., Administrator, 1890 Extension Program, Virginia State University, Petersburg, Virginia 23803.

Disease Symptoms or Signs (usually not uniform over the entire vegetable crop but instead occurring in areas or groups of plants)

1. Necrosis (dead spots or areas on leaves, stems, fruits or roots.
2. Browning of the vascular system of the stem or petioles of the leaves visible when the stem is cut.
3. White powdery growth on the upper or lower surface of the leaves.
4. A rot or decay of plant tissues.
5. Obvious fungal growth on leaves, stems, flowers or fruits.
6. A mottling or stippling of the leaves or abnormal development of leaves or fruits.
7. Swellings on the roots.

Examine Vegetables for Patterns of Symptoms

- A. Do the symptoms occur on many kinds or types of plants? If so, it is unlikely that a disease is involved.
- B. Is there a correlation with low or high elevation, nearness to shrubs or trees or other areas of little air movement?
- C. Is there an association with time of planting, variety, cultural practices, etc.?
- D. Does the problem seem to be spreading? If so, under what particular conditions?

Collect Helpful Background Information

- A. Date the symptoms were first noticed.
- B. History of the garden area.
- C. Fertilization programs, previous pesticide application, and previous disease incidence.
- D. Weather conditions and watering or irrigation practices.

- E. Source of seed or transplants.
- F. Name of variety planted.

Recommended Equipment Helpful in the Diagnosis of Vegetable Diseases

- A. A hand lens, 10x.
- B. A sharp knife.
- C. Plastic bags and labels.
- D. A hand trowel.
- E. Notebook and pencils.

Diseases Caused by Fungi, Bacteria, Viruses and Nematodes

1. Plant pathogenic fungi cause leaf spots, root rot, wilt, rust, smut and powdery mildew. Plant protecting chemicals like fungicides, bactericides, and nematicides registered by the Environmental Protection Agency are recommended by VPI & SU.
2. Plant pathogenic bacteria are one-celled plants. Under favorable conditions these bacteria multiply rapidly. Symptoms of bacterial infection are crown gall, fire blight, bacterial canker and soft rot apparent as a slimy breakdown.
3. Viruses that cause plant diseases frequently are transmitted by insects such as aphids, leaf hoppers, white flies, beetles, grasshoppers and nematodes. They are also transmitted by pruning and grafting equipment. Symptoms of virus infections are various, such as mosaic, witches broom, calico, ring-spot, stunting, and other leaf malformations.
4. Nematodes that cause plant diseases are microscopic worms and may feed on the roots, stems and leaves of susceptible plants. One of the most common symptoms is called root knot. Others cause root damage resulting in stunting, nutrient deficiencies and chlorosis.