

R. Kenneth Horst

# Field Manual of Diseases on Grasses and Native Plants

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Plant Microbe Biology  
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# Preface

The information in this manual is taken in large part from the records of the Plant Disease Survey as given in the *Plant Disease Reporter*, *Plant Disease*, and from the *Index of Plant Diseases in the United States*, *Agriculture Handbook 165*, U.S. Department of Agriculture. There are a great many records that bring in new reports every day, and any such list is out of date by the time it is published, and is sure to be far from complete. This check list is offered as a helpful guide, a foundation on which to build. It is by no means the last word.

Hosts are listed alphabetically by common names except where the scientific names mean less confusion. The diseases are those mostly reported from North, Central, and South America.



# Contents

## Part I

Disease Control and Management.....	3
-------------------------------------	---

## Part II

Host Plants and Their Diseases.....	9
-------------------------------------	---

## Part III Grasses and Forage

Illustrations.....	13
A.....	15
B.....	17
C.....	19
D.....	21
E.....	23
F.....	25
G.....	27
H.....	33
I.....	35
J.....	37
K.....	39
L.....	41
M.....	43



**N**..... 45

**O** ..... 47

**P** ..... 49

**R**..... 51

**S** ..... 53

**T**..... 57

**V**..... 59

**W**..... 61

**Z**..... 63

**Part IV Native Flowers and Weeds**

**Illustrations**..... 67

**A**..... 69

**B**..... 73

**C**..... 77

**D**..... 85

**E**..... 89

**F**..... 91

**G** ..... 93

**H** ..... 99

**I**..... 103

**J**..... 105

**K** ..... 107

**L**..... 109

**M**..... 113

**N**..... 121

**O** ..... 123

**P** ..... 125

**Q** ..... 131

**R**..... 133

**S** ..... 137

**T** ..... 147

**U** ..... 151

**V** ..... 153

**W** ..... 157

**X** ..... 159

**Y** ..... 161

**Z** ..... 163

**Part V**

**List of Land-Grant Institutions and Agricultural  
Experiment Stations in the United States** ..... 167

**Glossary** ..... 171

# Part I

# Disease Control and Management

Control of a plant disease means reduction in the amount of damage caused. Our present annual toll from disease is nearly four billion dollars. Perfect control is rare, but profitable control, when the increased yield more than covers the cost of chemicals and labor, is quite possible. Commercial growers now average a return of four dollars for each dollar so invested. Keeping home plantings ornamental yields a large return in satisfaction and increased property value.

The five fundamental principles of control are exclusion, eradication, protection, resistance, and therapy.

1. *Exclusion* means preventing the entrance and establishment of pathogens in uninfested gardens, states, or countries. For home gardeners it means using certified seed or plants, sorting bulbs before planting, discarding any that are doubtful, possibly treating seeds or tubers or corms before they are planted, and, most especially, refusing obviously diseased specimens from nurseryman or dealer. For states and countries, exclusion means quarantines, prohibition by law. Sometimes restricted entry of nursery stock is allowed, the plants to be grown in isolation and inspected for 1 or 2 years before distribution is permitted.
2. *Eradication* means the elimination of a pathogen once it has become established on a plant or in a garden. It can be accomplished by *removal* of diseased specimens, or parts, as in roguing to control virus diseases or cutting off cankered tree limbs; by *cultivating* to keep down weed hosts and deep ploughing or spading to bury diseased plant debris; by *rotation* of susceptible with nonsusceptible crops to starve out the pathogen; and by *disinfection*, usually by chemicals, sometimes by heat treatment. Spraying or dusting foliage with sulfur after mildew mycelium is present is eradication, and so is treating the soil with chloropicrin to kill nematodes and fungi.
3. *Protection* is the interposition of some protective barrier between the susceptible part of the suscept or host and the pathogen. In most instances this is a protective spray or dust applied to the plant in advance of the arrival of the fungus spore; sometimes it means killing insects or other inoculating agents; sometimes it means the erection of a windbreak or other mechanical barrier.

4. *Resistance* is control by the development of resistant varieties. Resistant varieties are as old as time. Nature has always eliminated the unfit, but since about 1890 man has been speeding up the process by deliberately breeding, selecting, and propagating plants resistant to the more important diseases. Resistant ornamental plants have lagged behind food plants, but we do have wilt-resistant asters, rust-resistant snapdragons, wilt-resistant mimosas. Here is the ideal way for home gardeners to control their plant diseases –in the winter when the seed order and the nursery list is made out – so easy, and so safe!
5. *Therapy* is control by inoculating or treating the plant with something that will inactivate the pathogen. Chemotherapy is the use of chemicals to inactivate the pathogen, whereas heat is sometimes used to inactivate or inhibit virus development in infected plant tissues so that newly developing tissue may be obtained which is free of the pathogen.

A **fungicide** is a substance that destroys or inhibits the growth of fungi. It may be an **eradicator**, applied to a plant, plant part, or the environment as a curative treatment to destroy fungi established within a given area or plant; or preferably it may be a **protectant**, applied to protect a plant or plant part from infection by killing, or inhibiting the development of, fungal spores or mycelium that may arrive at the infection court. A **bactericide** is a substance that destroys or inhibits bacteria and nematicide for nematodes. Among the more recent bactericides are antibiotics, products of other living organisms. They also have value against certain fungi. There are few **virocides**, which are toxic or poisonous to viruses.

A **pesticide** is any chemical that is used to kill pests, especially insects and rodents.

An **insecticide** is an agent used to kill insects.

A **disinfectant** is an agent that frees a plant or plant part from infection by destroying the pathogen established within it. A disinfectant kills or inactivates organisms present on the surface of the plant or plant part or in the immediate environment. Chemicals for seed treatment can be either eradicants or protectants, but most of them are disinfectants, in that they kill organisms on the surface of the seed rather than those within. In common usage, however, they are called disinfectants.

A **nematicide** is, of course, a chemical that kills nematodes in the soil or in the plant. Most nematicides are **fumigants**, chemical toxicants that act in volatile form.

The search for new fungicides goes on, with hundreds of synthetic organic compounds being screened each year. This screening is often a cooperative venture between manufacturers, state experiment stations, and the U.S. Department of Agriculture. After safety precautions for the operator and the environment, and the effectiveness of a compound for certain diseases have been determined, the chief question is whether the material is **phytotoxic**, that is, injurious to plants, at concentrations required for control. Phytotoxicity is an elusive factor, not to be pinned down in a few tests. It varies not only with the kind of plant but with the particular variety, the amount of moisture in the soil when the spray is applied, the temperature, whether or not the application is followed by rain or high humidity, the section

of the country, and the compatibility of the chemical with spreaders or wetting agents, as well as with other fungicides or insecticides. Coordinated tests with new materials in many different states are extremely valuable. Some compounds give rather uniform results over the country; others vary widely with climatic conditions.

Consumers are well protected against fraud, but they must be willing to read the fine print on labels if they are to choose intelligently from the bewildering array of proprietary compounds on dealers' shelves. Consumers must also read the fine print and follow directions exactly if their homegrown vegetables are to be as safe for consumption as those from commercial growers who have to comply with the law in the matter of residues.

Even if you follow exactly the directions for dosage given on the label, you may have some plant injury under your particular combination of soil, weather, and kinds of plants. Keep a notebook. Put down the date you sprayed, the dosage used, the approximate temperature and humidity, whether it was cloudy or sunny, in a period of drought or prolonged wet weather. Go around later and check for burning; for leaf spotting and defoliation from the spray or from failure to control the disease; for leaf curling or stunting; for too much unsightly residue. Note which varieties can take the spray and which cannot. Exclusive reliance must be placed on directions and information supplied by the manufacturer or by agricultural specialists, agents, or advisors. **Be sure to read the label.**

## Part II

# Host Plants and Their Diseases

## Headings Under Which Diseases Are Described

**ANTHRACNOSE** – dead spots with definite margins, often with pinkish slimy spore masses, on leaves, stems, or fruit.

**BACTERIAL DISEASES** – all types of diseases, galls, blights, rots, leaf spots, caused by bacteria.

**BLACK KNOT** – black, knotty enlargement of woody tissue.

**BLACKLEG** – darkening at the base of a plant.

**BLACK MILDEW** – superficial dark growth caused by parasitic fungi.

**BLACKSPOT** – a dark leaf spot on rose.

**BLIGHTS** – general killing of leaves, flowers, stems.

**BLOTCH DISEASES** – irregular necrotic areas on leaves or fruit.

**BROOMRAPES** – leafless herbs parasitic on roots.

**CANKERS AND DIEBACK** – localized lesions on stems or trunks, sometimes accompanied by dying back from the top.

**CLUB ROOT** – distorted swollen roots.

**DAMPING-OFF** – sudden wilting of seedlings or rotting of seeds in soil.

**DODDER** – parasitic seed plant with orange tendrils.

**DOWNY MILDEWS** – with internal mycelium but fruiting structures protruding to form white, gray, or violet patches.

**FAIRY RINGS** – mushrooms growing in circles.

**FRUIT SPOTS** – blemishes on fruit.

**GALLS** – noticeable enlargements of leaves, stems, or roots.

**LEAF BLISTER, LEAF CURL DISEASES** – leaf deformities.

**LEAF SCORCH** – discoloration as if by intense heat.

**LEAF SPOTS** – delimited dead areas in leaves.

**LICHENS** – occasional on trees, or shrubs.

**MISTLETOE** – semiparasitic seed plant, forming leafy tufts in trees.

**MOLDS** – conspicuous fungus growth on leaves, seeds, or grafts.

**NEEDLE CASTS** – conspicuous shedding of evergreen foliage.

**NEMATODES** – causing decline diseases and flowers.



NONPARASITIC DISEASES – due to environmental conditions rather than specific organisms.

POWDERY MILDEWS – superficial white felty or powdery growth on leaves and flowers.

ROTS – soft or hard decay or disintegration of plant tissues.

RUSTS – with reddish or rust-colored spore masses.

SCAB – raised or crustlike lesions on leaves or fruit.

SCURF – flaky or scaly lesions.

SLIME MOLDS – found in lawns.

SMUTS – with sooty black spore masses.

SNOW MOLD – light patches in turf, especially early spring.

SOOTY MOLD – superficial black mycelium growing in insect exudate.

SPOT ANTHRACNOSE – light spots with raised darker borders or scabby lesion caused by *Elsinoë* species.

VIRUS DISEASES – mosaics, ring spots, yellows, wilt caused by viruses.

WHITE RUSTS – white blisters in leaves.

WILTS – systemic diseases, with wilting, death of leaves, and branches.

WITCHWEED – weed parasitic on roots. The numbers given with the rusts refer to spore stages.

**Part III**  
**Grasses and Forage**

# Illustrations



**Plate 1** Dollar Spot on Turf caused by *Sclerotinia homeocarpa*

# A

## ALFALFA (*Medicago*)

ANTHRACNOSE. **Colletotrichum trifolii**, OH.

LEAF SPOT. **Phoma medicaginis**, WA.

ROT, Brown Root. **Phoma sclerotoides**, CO, ME, NM, PA, Ontario, Canada.

VIRUS. **Rhabdovirus**, Argentina; **Cucurbit Yellow Stunting Disorder**, CA.

## ARUNDO (Giant Reed)

LEAF SPOT; Cane “Anthracnose”; Dieback. **Papularia sphaerosperma**, general.

**P. odorae**, KS; **Phyllosticta tuberosa**, OK.

LEAF SPOT; Stem Speckle. **Selenophoma donacis**, CA.

ROT, Root. **Armillaria mellea**, MD.

RUST. **Puccinia chloridis** (*P. bartholomaei*) (0, I), KS, OK, TX; II, III on *Bouteloua* spp.; **Uromyces asclepiadis** (II, III), KS, NM, TX.

RUST, Crown. **Puccinia coronata**, CA.

## B

BAMBOO (*Bambusa*, *Phyllostachys*)

BLACK MILDEW. **Meliola tenuis**.

BLIGHT, Tip. **Diplodia bambusae**, LA, TX.

LEAF MOLD. **Cladosporium gramineum**, OR, SC.

LEAF SPOT. **Helminthosporium** sp., FL; **Mycosphaerella** sp., CA; Culm Spot, **Selenophoma donacis**, CA.

NEMATODE, Burrowing. **Radopholus similis**, FL.

RUST. **Kweilingia divina**, CA, HI, Brazil, Colombia; **Puccinia melanocephala** (II, III), FL, GA, MS, TX; **Uredo ignava** (II), FL, GA; **Uromyces costaricensis**, FL on Wild Bamboo (*Lasiacis divaricata*).

SMUT. **Ustilago shiraiana**, CA, FL, LA, TX.

VIRUS. **Bamboo Mosaic**, CA; **Sugarcane Mosaic Virus**, LA, on *Arundinaria gigantea*.

BARLEY

BLOTCH, Net. **Pyrenophora teres**, ND.

ERGOT. **Claviceps purpurea**, ND.

NEMATODE, Cereal Cyst. **Heterodera filipjevi**, OR, Pacific Northwest.

VIRUS. **Oat Blue Dwarf**, upper Midwest, United States.

BEAN, URD (*Vigna*) Forage and Cover Crops

BACTERIAL Leaf Spot; Stem Collapse. **Pseudomonas syringae** pv. **syringae**, ID.

VIRUS. **Cowpea Mosaic**, NY.

BEGGARWEED, FLORIDA (*Desmodium tortuosum*)

RUST, Soybean. **Phakopsora pachyrhizi**, AL, GA.

VIRUS. **Tomato Spotted Wilt**, GA.

BLUESTEM, BIG (*Andropogon*)

LEAF SPOT. **Ascochyta brachypodii**, NY, PA; **Phyllosticta andropogonivora**, MN, ND, SD.

VIRUS. **Barley Yellow Dwarf**.

BLUESTEM, LITTLE (*Schizachyrium*)

VIRUS. **Barley Yellow Dwarf.**

BRACHIARIA (Broadleaf signalgrass)

ROT, Root. **Pythium arrhenomanes**, LA.

BRACHYPODIUM (Slender False-Brome)

ANTHRACNOSE. **Colletotrichum graminicola**, MD.

BACTERIAL Spot. **Pseudomonas coronafaciens** var. **atropurpurea**, ND.

ROT, Root. **Curvularia geniculata** and **Fusarium scirpi**, secondary, ND.

BRISTLEGRASS (*Setaria*)

BLIGHT. **Beniowskia sphaeroidea**, GA, TX.

VIRUS. **Foxtail Mosaic.**

BROMEGRASS, False (*Brachypodium*)

RUST. **Puccinia brachypodii** and **P. striiformis**, Italy, Netherlands.

BROMEGRASS, Smooth (*Bromus*)

BACTERIAL, Halo Blight. **Pseudomonas syringae** pv. **coronafaciens**, AK.

POWDERY MILDEW. **Blumeria graminis**, **Erysiphe graminis**, PA.

RUST. **Puccinia recondita**, PA.

BUFFALOGRASS (*Buchloe*)

DOLLAR SPOT. **Sclerotinia homoeocarpa**, OK.

SMUT. **Tilletia buchloëana**, KS, NE, OK, TX.

# C

CANOLA (*Brassica napus*)

BLACK LEG. **Septosphaeria maculans**, KY; **Leptosphaeria maculans**, Canada, ND, (Winter Canola) OK.

DECLINE SYNDROME. Causal agent unknown, GA, KY, TN.

PHYTOPLASMA. **Candidatus asteris** (also on **Brassica rapa**), Saskatchewan, Canada.

ROT, Damping-off. **Rhizoctonia solani**, WA.

ROT, Root. **Sclerotinia sclerotiorum**, GA, TX.

STUNTING, Clubroot. **Plasmodiophora brassicae**, ME.

CENCHRUS (Buffelgrass)

BLIGHT. **Pyricularia grisea**, TX.

CENTIPEDE GRASS (*Eremochloa*)

ANTHRACNOSE. **Colletotrichum graminicola**, FL; **C. sublineola**, MS.

LEAF MOLD. **Curvularia** sp., LA; **Stachybotrys** sp., MD.

ROT, ROOT. **Gaeumannomyces graminis**, GA.

CLOVER (*Trifolium incarnatum*, *T. pratense*, *T. repens*, *T. stoloniferum*, *T. subterraneum*, *T. vesiculosum*)

BLACK SPOT, **Pseudomonas andropogonis**, NC.

BLIGHT, Root; Crown Rot. **Pythium ultimum**; **P. irregulare**; **Fusarium proliferatum**; **Rhizoctonia solani**, GA, TX.

LEAF SPOT. **Cercospora zebrina**, TX.

NEMATODE, Root-Knot. **Meloidogyne graminicola**, MS.

VIRUS. **Clover Yellow Mosaic**; **Crimson Clover Latent**; **Cucumber Mosaic**; **Peanut Stunt**, MO; **Red Clover Vein Mosaic**; **Subterranean Clover Red Leaf**, CA; **White Clover Mosaic**; **Alfalfa Mosaic**, WI; **Bean Yellow Mosaic**, AK.

COTTON (*Gossypium*)

CANKER, Stem. **Phoma exigua**, NC, VA.

NEMATODE. **Rotylenchus reniformis**, VA.

ROT, Lint. **Nigrospora oryzae**, AL.

ROT, Root. **Rhizoctonia solani**, MS.

ROT, Stem. **Sclerotinia sclerotiorum**, ND.

COWPEA (*Vigna sinensis*)

LEAF and STEM DISEASE. **Cercospora cibrina** (clover isolate), NC.

POD SPOT, Black; Seed. **Phomopsis longicolla**, MS.

ROT, Root. **Phytophthora megasperma**, NC.

VIRUS. **Brome Mosaic**, CA; **Cowpea Aphid-Borne Mosaic**, AR; **Cowpea Severe Mosaic**, AR, IN, LA.

WILT. **Fusarium oxysporum** f. sp. **tracheiphilum**, CA.

Cowpeas are of most interest to gardeners as a green manure crop, and there is little need of repeating here the long list of possible diseases, most of which are given under Bean. Ashy stem blight, charcoal rot, is fairly serious. The root-knot nematode is general, but varieties Iron and Bragham are almost immune. Fusarium wilt, general in the South, is largely controlled by using resistant varieties. Leaf spots are numerous, and some may cause defoliation. Rust is widespread on Blackeye and related varieties, but many varieties are resistant.

CROTALARIA (*C. retusa*) Croton

BLIGHT, Seedling. **Alternaria cassiae**, MS.

POWDERY MILDEW. **Oidium erysiphoides** var. **crotalariae**, LA, MS.

VIRUS. **Potato Virus X**, on *C. juncea*.

WILT; Root Rot. **Fusarium** sp., GA, TX.

This species is sometimes grown as an ornamental. Crotalaria as a cover crop has more diseases, but *C. spectabilis* is immune to root-knot nematode and so particularly useful between susceptible crops.

CRYPTANTHA

GALL, Leaf. **Synchytrium myosotidis**, AZ, CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, NV.

RUST. **Puccinia aristidae** (0, I); II, III on native grasses; **P. cryptanthes**, CA, WA.



# D

DOLICHOS (Twinflower, Hyacinth Bean) Forage

ANTHRACNOSE. **Colletotrichum dematium** f. sp. **truncata**, GA.

BLACK MILDEW. **Parodiella perisporioides**, NC.

LEAF SPOT. **Cercospora canescens**, FL.

NEMATODE, Root Knot. **Meloidogyne** spp., FL, SC.

POWDERY MILDEW. **Microsphaera euphorbiae**, IN.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Mosaic**, unidentified, MI; **Potato Virus X**, Work at Wisconsin on *Dolichos biflorus*, *D. lablab*.

# E

ECHINOCHLOA (Barnyardgrass)  
ROT, Root. **Pythium arrhenomanes**, LA.

ELEUSINE (Goosegrass)  
ROT, Root. **Pythium arrhenomanes**, LA.

# F

FILAREE, RED-STEM (*Erodium cicutarium*)  
NEMATODE, Lesion. **Pratylenchus minyus**, CA.  
VIRUS. **Filaree Red Leaf**, CA.

# G

GOLDENTOP (*Lamarckia*)

RUST. ***Puccinia coronata*** (II, III), CA; ***P. graminis***, CA.

VIRUS. **Mosaic**, IA.

GRASSES, LAWN, TURF

(Includes *Agropyron repens*, quackgrass; *Agrostis alba*, redtop; *A. canina*, *A. palustris*, *A. stolonifera*, *A. tenuis*, bentgrasses; *Cynodon dactylon*, Bermuda grass; *Festuca* spp., fescues; *Poa compressa*, *P. pratensis*, *P. annua*, and *P. trivialis*. Canada, Kentucky, annual bluegrasses and Roughstalk; *Stenotaphrum*, St. Augustine grass; *Dactylis glomerata*, orchardgrass; *Lolium multiflorum*, Italian ryegrass; *L. perenne*, Perennial ryegrass; *Ammophila breviligulata*, American beachgrass; *Imperata cylindrica*, Cogangrass; *Miscanthus sinensis*, Perennial grass; *Spartinia alterniflora*, smooth cordgrass)

ANTHRACNOSE. ***Colletotrichum graminicolum***, general.

BACTERIAL Blight. ***Pseudomonas syringae* pv. coronafaciens**, AK; ***P. syringae* pv. alisalensis** on brome, oat, and common timothy grasses, CA; ***Xanthomonas translucens* pv. poae**, MT; ***X. translucens* pv. cerealis**, ID.

BACTERIAL Gummosis. ***Rathayibacter rathayi***, MD, OR, Northeast and Mid-Atlantic U.S.

BACTERIAL Stunting. ***Clavibacter xyli* subsp. cynodontis**, FL.

BACTERIAL Wilt, Decline, and Necrosis. ***Acidovorax* spp.**, NC.

BACTERIAL, Xylem-limited. **Rickettsialike organism**, MI.

BLACK SPOTS, FOLIAR. ***Exserohilum longirostratum***, MS, TX.

BLIGHT. ***Fusarium roseum* f. sp. cerealis**, MD, NJ, NY, OH, PA; ***F. tricinctum* f. sp. poae**; ***Leptosphaeria korrae***, CA, MD, NJ, NY, and ***Phialophora graminicola***, CA, NJ, NY. (New identification for *Fusarium* Blight); ***Limonomyces roseipellis***, NC; ***Labyrinthula* sp.**, AZ.

BLIGHT, Cottony. ***Pythium aphanidermatum***, general.

BLIGHT, Dieback (on Johnsongrass, ***Sorghum halepense***); Yellow Foxtail, ***Setaria glauca***; Broadleaf Signalgrass, ***Brachiaria platyphylla***. ***Bipolaris cyanodontis***,

- Southeast U.S.; **Curvularia lunata**, Southeast U.S.; **C. geniculata**, Southeast U.S.; **Exserohilum rostratum**, Southeast U.S.
- BLIGHT, Foliar. **Pythium sylvaticum**, IL; **Colletotrichum cereale**, AL, MS.
- BLIGHT, Leaf. **Pyricularia grisea**, on bent and St. Augustine; **Pellicularia filamentosa** f. sp. **sasakii**; **Drechslera catenaria**, OH; **Rhizoctonia solani**, FL; **Penicillium oxalicum**, NC; **Pithomyces chartarum**, KY.
- BLIGHT, Melting Out. **Curvularia geniculata**; **C. inaequalis**; **C. lunata**; **Sclerotinia homoeocarpa**, MS.
- BLIGHT, Rapid. **Labyrinthula terrestris**, CO.
- BLIGHT, Southern. **Sclerotium rolfsii**, FL, IL, NJ.
- BLIGHT (Zonate Leaf Spot). **Drechslera gigantea** (*Helminthosporium gigantea*), RI; **Bipolaris sorokiniana**, Southeast, U.S.
- BLOTCH, Purple leaf. **Septoria macropoda**; **S. agropyrina**, brown; **S. elymi**, northern U.S.
- CHOKER. **Epichloe typhina**, OR.
- DAMPING-OFF. **Cladochytrium graminis**, on bentgrass.
- DEAD SPOT. **Ophiosphaerella agrostis**, MD, Ontario, Canada; (Spring Dead Spot) **O. herpotricha**, MS.
- DIEBACK, Wetland. **Fusarium aestuarinus**, CT.
- DODDER. **Cuscuta** sp., MO.
- DOLLAR SPOT. **Sclerotinia homoeocarpa**, IL, NY, PA, WA.
- DOWNY MILDEW. **Sclerophthora macrospora**, IL, LA, MS, TX, on St. Augustine grass and Kentucky bluegrass; **Sclerospora farlowii**, OK, on Bermuda grass.
- ERGOT. **Claviceps purpurea**, NY to KY, MT, ND, TX, OK, OR, WI; **C. microcephala**, MD, MI, OH; **C. cynodontis**, OK.
- FAIRY RING. **Marasmius oreades**; **Psalliota campestris**; **Lepiota morgani**; **Cyathus stercoreus** (birds nest fungus), MN.
- HONEYDEW. **Claviceps purpurea**, OK.
- LEAF SPOT. **Ascochyta agropyrina**, Northwest; **A. desmazieri**; CA, OR, WA; **A. elymi**; **A. graminea** on Bermuda grass; **A. hordei**; **A. sorghi**; **A. graminicola**; **A. utahensis**; **Cercospora seminalis**, TX; **C. fuscomaculans**; **C. poagensis**; **Cylindrosporium glyceriae**, NY; **Leptosphaeria korrae**, ringspot, MD, PA, WI; **Macrophoma** sp., OR; **Ovularia pulchella**, OR, UT; **Phaeoseptoria** sp., OR; **Placosphaeria graminis**; **Septogloeum oxysporum**, char spot, wide-spread; **Stagonospora intermixta**; **Pithomyces chartarum**, NE; **Bipolaris hawaiiensis**, MS.
- LEAF SPOT, Black, Tar. **Phyllachora graminis**, widespread; **P. sylvatica**, Northwest.
- LEAF SPOT, Brown Stripe. **Scolecotrichum graminis**, widespread, except on ryegrass.
- LEAF SPOT, Copper. **Ramulispora** (*Gloeocercospora*) **sorghi**, CA, LA, PA, RI, on bentgrass.
- LEAF SPOT, Frog-eye. **Selenophoma donacis**, northern states; **S. everhartii**; **S. obtusa**.
- LEAF SPOT, Gray. **Pyricularia grisea**, blast disease, CA, CT, IL, IN, ME, MA, NH, PA, RI; **P. perenne** (on ryegrass), NV.

LEAF SPOT, Gray Leaf Speckle. **Septoria triseti**, OR, WA on redtop, bent; **S. calamagrostidis**, AK, OR, WY; **S. loligena**, CA; **S. nodorum**; **S. oudemansii**, northern U.S.; **S. secalis**, white leaf spot; **S. tenella**, northern plains; **S. tritici** var. **lolicola**.

LEAF SPOT, Melting-out. **Helminthosporium vagans**, on bluegrass; **H. sativum**; **H. giganteum**, Zonate eye-spot, general; **H. dictyoides**, fescue netblotch; **H. siccans**, brown blight; **H. stenacrum**, leaf mold; **H. triseptatum**, gray leaf mold; **H. cynodontis**, Bermuda grass leaf blotch; **H. erythrospilum**; **H. rostratum**; **H. stenophilum**.

LEAF SPOT, Red Eye-Spot. **Mastigosporium rubricosum**, ME, OR, WA, WY.

LEAF SPOT, Yellow Ring. **Trechispora alnicola**, IL.

MOLD. **Cladosporium herbarum**; **Fusarium heterosporum**.

NEMATODE. **Longidorus breviannulatus**, Quebec, Canada; **L. elongates**, Canada.

NEMATODE, Barley Root Knot. **Meloidogyne naasi**, Quebec, Canada.

NEMATODE, Cyst. **Punctodera punctata**, NJ; **Heterodera iri**, CT, ME, MA, NH, NY, RI.

NEMATODE, Dagger. **Xiphinema americanum**.

NEMATODE, Gall. **Anguina agrostis**.

NEMATODE, Lance. **Hoplolaimus coronatus**.

NEMATODE, Lesion. **Pratylenchus brachyurus**; **P. pratensis**; **P. subpenetrans**; **P. thornei**; **P. fallax**.

NEMATODE, Pin. **Paratylenchus projectus**.

NEMATODE, Pseudo Root Knot. **Hypsoperine graminis**, AL, MD, TN.

NEMATODE, Ring. **Criconemoides lobatum**; **C. rusticum**, **C. xenoplax**, **C. ornatum**, **C. parvum**, **C. curvatum**, OH; **Criconemella xenoplax**, SC.

NEMATODE, Root Knot. **Meloidogyne** sp.; **M. incognita**; **M. spartinae**, CT, MA; **Subanguina radicola**, New Brunswick, Canada.

NEMATODE, Seed Gall. **Anguina agrostis**, MN, VA.

NEMATODE, Spiral. **Helicotylenchus nannus**; **H. dihystra**; **Rotylenchus cristiei**, FL.

NEMATODE, Sting. **Belonolaimus gracilis**; **B. longicaudatus**, CA.

NEMATODE, Stubby Root. **Paratrichodorus christiei**; **P. obtusa**.

NEMATODE, Stylet. **Tylenchorhynchus brevidus**; **T. claytoni**; **T. dubius**.

NONPARASITIC. **Burn**. Mowing too close in hot weather. **Spring Dead Spot**. Too much thatch.

PATCH, SUMMER. **Magnaporthe poae**, OH.

POWDERY MILDEW. **Erysiphe graminis**, general.

RING PATCH, Brown. **Waitea circinata** var. **circinata**, CA, MN, NJ, PA, VA, WV, WI; **Waitea circinata**, AZ, FL, British Columbia, Canada.

ROT, Basal Stem. **Pythium sylvaticum**, IL.

ROT, Blind Seed. **Gloeotinia temulenta**, OR.

ROT, Crown. **Drechslera catenaria**, OH.

ROT, Culm. **Fusarium culmorum**; **Gibberella zeae**.

ROT; Dollar Spot; Small Brown Patch. **Sclerotinia homoeocarpa**, general.

ROT, Foot. **Ophiobolus graminis**, NY, WA.

- ROT; Large Brown Patch. **Pellicularia filamentosa** (*Rhizoctonia solani*); widespread, more important on bentgrass than on bluegrass; **Magnaporthe poae**, FL, NC; **Ophiosphaerella agrostis**, FL, MD, MA, MS, MO, NC, OH, TX, VA (eastern seaboard).
- ROT; Pink Patch; Red Thread. **Corticium fuciforme**, general.
- ROT, Root. **Pythium debaryanum**; **P. arrhenomanes**, LA; **P. volutum**, NC; **P. ultimum**; **Fusarium** spp.; **Olpidium brassicae**; **Pyrenochaeta terrestris**, IL; crown and root, **Ophiosphaerella agrostis**, TX; **Gaeumannomyces graminis** var. **graminis**, MS.
- RUST. **Puccinia graminis** subsp. **graminicola**, OR; **Puccinia pygmaea**, NY; **Uromyces mysticus** (II, III), OR; **U. dactylidis**, IN, MI, SD, VI.
- RUST, Bluegrass. **Puccinia poae-nemoralis**, widespread; **P. recondita** on brome grass, PA; **P. striiformis**, stripe rust, OR; **P. cynodontis**, on Bermuda grass; **P. stenotaphri**, on St. Augustine grass; **P. piperi**; **P. brachypodii** and **P. striiformis** on false brome grass, Italy, Netherlands.
- RUST, Crown. **Puccinia coronata** (II, III), cosmopolitan, N. America; **P. glumarum**.
- RUST, Stem; Wheat. **Puccinia graminis**, cosmopolitan.
- SCAB. **Fusarium heterosporum**, MO.
- SLIME MOLD. **Mucilago spongiosa**; **Physarum cinereum**; **Fuligo septic**; **Labyrinthula terrestris**, CO.
- SMUT, Bluegrass Blister. **Entyloma irregulare** and other spp.
- SMUT, Flag. **Urocystis agropyri**, OH, WI.
- SMUT, Head; Bunt. **Tilletia pallida**, NJ, OH, OR; **T. fusca**; **T. buchloëana**, KS, NE, OK, TX.
- SMUT, Inflorescence. **Sorosporium syntherisma**, CA.
- SMUT, Stripe. **Ustilago striiformis**, widespread; **U. cynodontis** on Bermuda grass in South; **U. buchloes**, TX.
- SNOWMOLD, Blight. **Fusarium nivale**, AK, MI, MN, OR, WA; **Calonectria graminicola**; **Sclerotinia borealis**, AK; **Sclerotium rhizodes**, white tip, CT, MA, NJ, PA, WI; **Typhula itoana**, MA, MN, NJ, NY, PA; **T. idahoensis**, ID.
- SPRING DEAD SPOT. **Gaeumannomyces graminis** var. **graminis**, AL, FL, NC, TX; **Ophiosphaerella herpotricha**, MS; **O. korrae**; **O. narmari**, KS, OK.
- STEM EYESPOT. **Phloeospora idahoensis**, OH.
- SUMMER PATCH. **Magnaporthe** spp., CA, CO, KS, NE, WA.
- SYMBIOTIC ENDOPHYTE. **Acremonium typhinum**, NJ.
- VIRUS. **Bromegrass Mosaic**. General, IA, IL; **Clover Yellow Vein**, GA; **Maize Dwarf Mosaic**; **Peanut Mottle**, GA; **St. Augustine Decline Virus (Panicum Mosaic)**, AR, LA, TX; **Sugarcane Mosaic**, FL, IL; **Barley Yellow Dwarf**, IN, MO; **Cocksfoot Streak**; **Agropyron Mosaic**; **Grapvine Fanleaf**, CA; **Lolium Latent**, MD.
- WILT, Necrosis. **Acidovorax** spp., NC.

The possibility of any large proportion of these diseases appearing in the average suburban lawn is remote. Snowmold occurs occasionally after a winter when

the snow cover has been rather continuous, but the light tan areas disappear by late spring. Large brown patch is fairly general in humid summer weather along with dollar spot, and *Helminthosporium* leaf spots or melting-out. Merion bluegrass is resistant to the latter but not to bluegrass rust. *Acremonium* sp. first *Clavicipitaceous* endophyte of perennial ryegrass (*Lolium perenne*) caused a hyperthermia syndrome of cattle, TX, WA.



# H

HARES-TAIL (*Lagurus*)

RUST. ***Puccinia coronata*** (II, III), crown; ***P. graminis***, stem, WA.

HEMPSESBANIA (*Sesbania*) Cover Crop

CANKER, STEM. ***Diaporthe phaseolorum*** var. ***caulivora***, LA.

# I

INDIAN GRASS (*Sorghastrum*)

ANTHRACNOSE. **Colletotrichum caudatum**, NY.

LEAF SPOT. **Ascochyta brachypodii**, NY, PA.

VIRUS. **Barley Yellow Dwarf**.

# J

## JOBS-TEARS (*Coix lachryma-jobi*)

SMUT, Head. **Ustilago coicis**. Intercepted on imported seed.

VIRUS. **Chlorotic Streak**.

## JOHNSONGRASS (Sorghum)

ANTHRACNOSE. **Colletotrichum sublineolum**, AR.

BACTERIAL Leaf Blight. **Acidovorax avenae** (syn. **Pseudomonas avenae**), IL.

BLIGHT, Leaf. **Pantoea agglomerans**, Mexico.

DOWNY MILDEW. **Peronosclerospora sorghi**, TX.

ERGOT. **Claviceps africana**, TX; **Sphacelia** sp., MS.

LEAF SPOT, Oval. **Ramulispora sorghicola**, TX.

ROT, Root. **Pythium arrhenomanes**, LA; **P. ultimum**, MS.

VIRUS. **Johnsongrass Mosaic**; **Sorghum Stunt Mosaic**, CA; **Sorghum Chlorotic Spot**, KS; **Maize Dwarf Mosaic**, IL.

WILT, Vascular. **Pantoea agglomerans**, Mexico.

# K

KNOTROOT BRISTLEGRASS (*Setaria geniculata*)  
BLIGHT. **Beniowskia sphaeroidea**, GA.

# L

LAWNS (See Grasses)

LEMON GRASS, CITRONELLA GRASS (*Cymbopogon*)

LEAF SPOT, Eye-spot. **Helminthosporium sacchari**, FL.

RUST. **Puccinia nakanishikii**, CA.

TANGLE-TOP. **Myriogenospora paspali**, FL.

# M

## MELILOTUS

BROOMRAPE. **Orobanche ramosa**, TX.

POWDERY MILDEW. **Oidium** sp., KS.

VIRUS. **Sweet Clover Latent**, IL.

# N

NUTSEDGE (*Cyperus rotundus*) Grass-like

BLIGHT, Flower. **Balansia cyperi**, LA.

LEAF SPOT. **Dactylaria higginsii**, FL; **Sclerotinia minor**, NC.

NEMATODE, Cyst. **Heterodera moths**, GA.

NEMATODE, Root-Knot. **Meloidogyne graminicola**, GA.

ROT, Root. **Pythium arrhenomanes**, LA.

RUST. **Puccinia canaliculata**, GA.

VIRUS. **Impatiens Necrotic Spot Phytoplasma**, GA.

# O

## OAT

VIRUS. **Oat Blue Dwarf**, upper Midwest, United States.

## OPLISMENUS (Basket-grass)

LEAF SPOT, Tar. **Phyllachora punctum**, FL, LA.

## OSAGE-ORANGE (*Maclura*)

BLIGHT, Leaf. **Sporodesmium maclurae**, MO, SC, TX; **Botrytis cinerea**, OR, gray mold on stems.

DAMPING-OFF. **Pythium ultimum**, NE; **Rhizoctonia solani**, NE.

LEAF SPOT. **Cercospora maclurae**, AL; **Ovularia maclurae**, AL, LA, TX; **Phyllosticta maclurae**, MO, NJ.

MISTLETOE. **Phorodendron tomentosum**, TX; **P. serotinum (flavescens)**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Cerotelium fici** (II), SC to FL and TX.

WILT. **Verticillium** sp., CT.



# P

PACHYSANDRA (Japanese-Spurge) Ground Cover

BLIGHT, Leaf; Stem Canker. **Volutella pachysandrae** (*Pseudonectria pachysandricola*), CT, DE, NJ, NY, PA, VA; **Sphaeropsis** sp., tip blight, secondary.

LEAF SPOT. **Gloeosporium** sp., VA; **Phyllosticta pachysandrae**, NY, NC, PA, VA; **Septoria pachysandrae**, FL, TN.

NEMATODE, Root-Knot. **Meloidogyne** sp.

VIRUS. **Alfalfa Mosaic**, NJ.

Volutella leaf blight is fairly common after injury or when plants are too crowded; pinkish spore pustules appear on stems, large brown areas on leaves.

PAMPAS GRASS (*Cordaderia*)

LEAF SPOT. **Helminthosporium** sp., GA; **Hendersonia culmiseda**, leaf mold; **Phyllosticta** sp., KY.

PENNISETUM

BACTERIAL STRIPE. **Acidovorax avenae** subsp. *avenae*, GA.

BLACK CHOKE DISEASE. **Ephelis** sp., MD.

BLIGHT, Basal Leaf. **Waitea circinata** var. **prodigus**, CA.

LEAF SPOT. **Helminthosporium giganteum**, MD; **Phyllosticta penicillariae**, GA; also stunt and chlorosis; **Gaeumannomyces graminis** var. **graminis** (also yellowing), CA.

LEAF SPOT, Gray. **Pyricularia grisea**, CA.

SMUT, Seed. **Ustilago penniseti**, VA.

VIRUS. **Maize Chlorotic Dwarf Virus**, OH.

PEPPER-GRASS, GARDEN CRESS (*Lepidium*)

DAMPING-OFF. **Pythium debaryanum**, TX; **Rhizoctonia solani**, TX.

DOWNY MILDEW. **Peronospora lepidii**, IA, SD, TX.

ROT, Crown. **Sclerotinia sclerotiorum**, MA.

ROT, Root. **Pyrenochaeta terrestris**, pink root, ND, SD; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia aristidae** (0, I), TX; II, III on grasses.

VIRUS. **Bidens Mottle**, FL.

WHITE RUST; White Blister. **Albugo candida**, general; CA.

PLUMEGRASS (*Erianthus*)

ANTHRACNOSE. **Colletotrichum falcatum**, LA.

ERGOT. **Claviceps purpurea**, AL, OK.

LEAF SPOT; Mold. **Cladosporium erianthi**, SC; **Curvularia** sp., FL; **Helminthosporium** sp., FL; **Phyllachora erianthi**, tar spot, AL, FL, GA, SC.

RUST. **Puccinia virgata** (II, III), GA; **P. polysora** (II, III), 0, I unknown.

# R

REED GRASS (*Calamagrostis* × *acutifolia*)  
ANTHRACNOSE. **Colletotrichum cereale**, NJ.

RHODESGRASS (*Chloris gayana*)  
LEAF STRIPE, Culm Stripe. **Helminthosporium hawaiiense**, FL.

RIBBON-GRASS (*Phalaris*)  
ERGOT. **Claviceps purpurea**, NY.  
LEAF BLOTCH (SPOT). **Stagonospora foliicola**, PA.  
LEAF SPOT. **Helminthosporium catenarium**, PA on Reed Canary grass (*P. arundinacea*).  
LEAF SPOT, Zonate Eye-Spot. **Helminthosporium giganteum**, MD.

RICE (*Oryzae sativa*) Cereal Grass  
BLIGHT, Panicle. **Burkholderia glumae** and **B. gladioli**, Southern U.S., Panama.  
LEAF, Blast. **Pyricularia grisea**, AR.  
LEAF Streak, White. **Mycovellosiella oryzae**, TX.  
SMUT, False. **Ustilagoideia virens**, LA.

# S

SAINFOIN (*Onobrychis*) Fodder

DAMPING-OFF. **Rhizoctonia solani**, TX; **Sclerotium rolfsii**, TX.

NEMATODE, Root-Knot. **Meloidogyne hapla**, WY.

ROT, Stem. **Rhizoctonia solani**, TX; **Sclerotium rolfsii**, TX.

ST. AUGUSTINEGRASS (*Stenotaphrum*)

ROT, Root. **Gaeumannomyces graminis** var. **graminis**, FL, TX.

VIRUS. **Panicum Mosaic**, AR.

SALTGRASS (*Distichlis*)

BROWN STRIPE. **Bipolaris heveae**, CO.

SEASHORE PASPALUM (*Paspalum*)

BLIGHT, Basal Leaf. **Waitea circinata** var. **prodigus**, FL.

NEMATODE. **Helicotylenchus** sp., FL.

ROT, Root/Stolon. **Gaeumannomyces graminis** var. **graminis**. FL.

SOYBEAN (*Glycine max*)

ANTHRACNOSE. **Glomerella glycines**, IA, MI, NC to FL, NE, TX; **Colletotrichum truncatum**; **C. coccoades**, IL.

BACTERIAL Blight. **Pseudomonas syringae** pv. **glycinea**, East and South to MN, TX.

BACTERIAL, MLO. Bud Proliferation, LA.

BACTERIAL Leaf Crinkle. Unidentified, Midwest.

BACTERIAL Pustule; Pustular Spot. **Xanthomonas glycines** (**phaseoli** var. **sojense**), general.

BACTERIAL Tan Spot. **Clavibacter flaccumfaciens**, IA.

BACTERIAL Wildfire. **Pseudomonas tabaci**, MD to AL, LA, NE.

BACTERIAL Wilt. **Pseudomonas solanacearum**, NC.

BLIGHT, Aerial. **Rhizoctonia solani**, LA.

BLIGHT, Ashy Stem; Charcoal Rot. **Macrophomina phaseoli**, NJ to SC, NE, OH, TX, WA, WI.

BLIGHT, Gray Mold; Leaf Spot. **Botrytis cinerea**, CT, OH.

BLIGHT, Leaf. **Choanephora infundibulifera**, LA.

- BLIGHT, Pod and Stem. **Diaporthe sojae**, NY, MI, to GA, KS, LA.
- BLIGHT. **Sclerotinia minor**, **S. sclerotiorum**, VA.
- BLIGHT, Southern. **Sclerotium rolfsii**, VA to FL, IA, KS, TX.
- CANKER, Stem. **Diaporthe phaseolorum** vars. **batatatis**, **meridionalis**, and **caulivora**, AR, FL, IL, IN, KY, LA, MD, OH, SC, TX, WI; **Phyllosticta sojicola**, AR, MD, stem and pod canker.
- DAMPING-OFF. **Fusarium solani**, MN, ND.
- DAMPING-OFF; Root Rot. **Pythium** spp., IL, IA, MN, MO, NC, ND; **P. aphanidermatum**; **P. torulosum**, IA; **P. delawarii**, OH; **Phytophthora megasperma** f. sp. **glycinea**, VA.
- DECAY, Root, Stem. **Mycoleptodiscus terrestris**, WI.
- DOWNY MILDEW. **Peronospora manshurica**, East and South to LA, IA.
- LEAF SPOT. **Alternaria** sp., widespread, secondary; **Cercospora canescens**, also on pods, stems, AL, IL, MD, MS, NC, TX, WV; **C. kikuchii**, also purple stain of seed, IN, MD, NC, VA; **C. sojina**, frogeye leaf spot, MI to FL, IA, NY, OK, VA, WI, Argentina; **Corynespora cassiicola** (*Helminthosporium vignicola*), target spot, AL, AR, FL, GA, LA, MN, MS, NC, SC; **Helminthosporium vignae**, zonate leaf spot, NC; **Mycosphaerella cruenta**, GA, MS; **Myrothecium roridum**, secondary, LA; **Phyllosticta glycinea**, IL, MD, MO, NC, VA; **Pleosphaerulina sojicola**, ME, NJ, NY, WI.
- LEAF and STEM DISEASE. **Cercospora zebrina** (clover isolate), NC.
- LEAF SPOT, Brown Spot. **Septoria glycines**, AR, DE, IN, IA, MD, NC, WI.
- MOLD, White. **Sclerotinia sclerotiorum**, ME.
- NEMATODE, Cyst. **Heterodera glycines**, soybean cyst, AR, IA, KS, KY, LA, MI, MN, MO, NE, NC, ND, OH, SD, TN, TX; **H. gottingiana**, peacyst; **H. trifolii**, clover cyst; **Cactodera estonica**, WI.
- NEMATODE, Dagger. **Longidorus** sp.
- NEMATODE, Lesion. **Pratylenchus safaenis**, GA.
- NEMATODE, Root Knot. **Meloidogyne hapla**; **M. javanica**.
- NEMATODE, Spiral. **Helicotylenchus erythrinae**; **H. nannus**.
- NEMATODE, Stem. **Ditylenchus dipsaci**, NY.
- NEMATODE, Sting. **Belonolaimus gracilis**; **B. longicaudatus**, DE.
- NONPARASITIC. **Baldhead**. Mechanical injury. **Chlorosis**. Interveinal. Manganese deficiency, AL, NC, TN. **Yellowing**. Potassium deficiency, iron deficiency.
- PHYTOPLASMA, Stunting, Small Leaves, Aborted Seed Pods, Costa Rica.
- POWDERY MILDEW. **Erysiphe polygoni**, DE, IA, NC, SC; **Microsphaera diffusa**, DE, MN, NC.
- ROOT DEATH, Yellowing and Stunting. **Phytophthora sansomeana**, OR.
- ROT, Charcoal. **Macrophomina phaseolina**, IA, MN, ND.
- ROT, Red Crown. **Cylindrocladium crotalariae**, Telemorph, **Calonectria crotalariae**, MS.
- ROT, Root. **Corynespora cassiicola**, WI; **Phymatotrichum omnivorum**, TX; **Pythium aphanidermatum**, AZ; **P. dissotocum**, AZ; **Stachybotrys chartarum**, IL; **Fusarium oxysporum**, **F. solani**, **F. acuminatum**, **F. proliferatum**, IA, MN; **F. redolens**, MN; **F. tricinctum**, MN.
- ROT, Root Black. **Thielaviopsis basicola**, AR.

ROT, Root and Stem. **Fusarium virguliforme**, MN; **Phytophthora megasperma** f. sp. **glycinea**, DE, Northeast, MN, SD; **P. sojae**, AR, IL, MN, ND.

ROT, Seed. **Fusarium scirpi**, NE; **F. graminearum**, IL; **Nematospora coryli**, NC, OK, SC, VA; **Aspergillus** spp.; **Phomopsis sojae**, NY.

ROT, Stem. **Cephalosporium gregatum**, brown stem, IL, IN, IA, KY, MN, MO, NC, OH, VA; **Pellicularia filamentosa**, also root rot, canker, general; **Sclerotinia sclerotiorum**, AZ, IA, MD, NY, VA; **Phytophthora megasperma** var. **sojae**; **Neocosmospora vasinfecta**, AL.

RUST. **Phakopsora pachyrhizi**, AL, AR, FL, GA, HI, IL, IN, IA, KY, LA, MD, MS, MO, NE, NC, SC, TN, TX, VA, Cuba, Yucatan Peninsula, Mexico; **P. packopsora**, VA, Mexico.

SEED INFECTION. **Phomopsis longicolla**, IA.

SUDDEN DEATH SYNDROME. **Fusarium solani** f. sp. **glycines**, AR, DE, IA, KY, MN, MO, NE, OH, PA; **F. tucumaniae**, Argentina; **F. virguliforme**, MI, WI; **Phoma** sp.; **Epicoccum** sp.; **Alternaria** sp., **Trichoderma** sp., MO.

VIRUS. **Soybean Mosaic**, ND; **Tobacco Ring Spot**, causing bud blight, midwestern U.S.; **Beet Curly Top**; **Bean Pod Mottle**, NE; **Soybean Yellow Mosaic**, Midwest; **Cowpea Mosaic**, IL; **Tobacco Streak**, OK; **Soybean Dwarf**, CA, IL, WI; **Tobacco Mosaic**; **Pepper Golden Mosaic**, Mexico; **Bean Pod Mottle**, AL, Ontario, Canada; **Tomato Spotted Wilt**, AL, GA; **Rhynchosia Golden Mosaic**, Mexico; **Iris Yellow Bunyaviridae**, FL, GA; **Soybean Yellow Mottle Mosaic**, MS; **Soybean Vein Necrosis**, TN; **Alfalfa Mosaic**, TN.

WILT. **Fusarium oxysporum** f. sp. **tracheiphilum**, PA to FL, NE, TX; also CA.

Edible soybeans are well-suited to home garden culture and usually produce a good crop without control measures beyond dusting seed with a protectant before planting. Commercial growers find a number of diseases of economic importance; bacterial pustule, the various blights, leaf spots, downy mildew, wildfire, virus diseases. Some areas are now under quarantine for the soybean cyst nematode.

STARGRASS, GOLDEN (*Hypoxis*) Grass-like

LEAF SPOT. **Cylindrosporium guttatum**, WI; **Septoria hypoxis**, PA.

RUST. **Uromyces affinis** (I, III), CT, MS, MO; **U. necopinus**, NY.

SMUT, Flower. **Urocystis hypoxis**, CT, MA.

SWITCHGRASS (*Panicum*)

ANTHRACNOSE. **Colletotrichum graminicola**, TN; **C. navitas**, NY.

BLOTCH, Spot. **Helminthosporium sativum** (*Bipolaris sorokiniana*), PA, TN.

BUNT. **Tilletia pulcherrima**, TX.

DOLLAR SPOT. **Sclerotinia homoeocarpa**, TN.

FOLIAR and SEED INFECTION. **Alternaria**, **Bipolaris**, **Curvularia** and **Fusarium** spp., TN.

LEAF SPOT. **Bipolaris sacchari**, FL; **B. oryzae**, MS, NY, ND; **Rhizoctonia zeae** (also sheath spot), RI; **Bipolaris spicifera**, TN.

ROT, Root. **Pythium arrhenomanes**, LA; **Bipolaris sorokiniana**, TN.

RUST. **Puccinia emaculata**, AR, TN.

SMUT. **Tilletia maclaganii**, IA, NY, PA.

VIRUS. **Barley Yellow Dwarf**; **Maize Rayado Fino**, IL.

# T

TREFOIL, BIRDSFOOT (*Lotus*)

DECAY; Rot. Root, Stem. **Mycoleptodiscus terrestris**, DE, WI.

LEAF SPOT. **Cercospora zebrina** (clover isolate), NC.

RUST. **Uromyces** sp., PA, rust pustules were colonized by **Sphaerellopsis filum**.

# V

VELVET BEAN (*Stizolobium*)

BACTERIAL Spot. ***Pseudomonas syringae***, IN; ***P. stizolobii***, NC.

BLIGHT, Southern. ***Sclerotium rolfsii***, AL, FL, GA.

LEAF SPOT. ***Cercospora stizolobii***, AL, FL, GA, NC, SC; ***Mycosphaerella cruenta***, GA; ***Phyllosticta macunae***, AL.

NEMATODE, Root Knot. ***Meloidogyne*** spp., CA, TX.

ROT, Pod Spot. ***Fusarium*** sp., TX.

ROT, Root. ***Phymatotrichum omnivorum***, AZ, TX; ***Phytophthora parasitica***, FL.



# W

## WHEAT (*Triticum*) Cereal

BLIGHT, Heat. **Fusarium tricinatum**, Argentina.

BLIGHT, Seedling. **Sclerotium rolfsii**, OK.

LEAF SPOT, Tan. **Pyrenophora tritici-repentis**, KS, Pacific Northwest.

NEMATODE, Cereal Cyst. **Heterodera filipjevi**, OR, Pacific Northwest.

POWDERY MILDEW. **Blumeria graminis** f. sp. **tritici**, NC, WI; **Erysiphe graminis**,  
**Septoria tritici**, **Stagonospora**, WI.

ROT, Damping-Off, Stunting. **Pythium abappressorium**, WA; **Arthrivium sacchari**,  
(Durum Wheat), Saskatchewan, Canada.

ROT, Root. **Phoma sclerotoides**, MN.

RUST. **Puccinia triticina**, (Durum Wheat), Mexico.

RUST, Stripe. **Puccinia striiformis** f. sp. **tritici**, FL.

RUST, Wheat Leaf. **Puccinia triticina**, (Red Spring Wheat), MN, ND.

STUNT, Leaf Stripe. **Cephalosporium gramineum**, VA.

VIRUS. **Triticum Mosaic**, Southern Great Plains, KS, OK, TX; **Soilborne Wheat Mosaic**, OR.

## WILD RICE (*Zizania*)

ANTHRACNOSE. **Colletotrichum sublineolum**, MN.

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **syringae**, MN, Pacific Northwest; **P. syringae** pv. **zizaniae**, Pacific Northwest.

BLIGHT, HEAD. **Fusarium graminearum**, MN.

LEAF SPOT, Stem Lesion. **Bipolaris sorokiniana**, Pacific Northwest; **Sclerotium oryzae**, Pacific Northwest; **S. hydrophilum**, Pacific Northwest.

LEAF SPOT, Zonate. **Drechslera gigantea**, MN.

ROT, Crown, Root. **Phytophthora erythroseptica**, CA; Damping-off. **Pythium torulosum**, CA.

SMUT. **Entyloma lineatum**, Pacific Northwest; **Ustilago esculenta**, CA.

VIRUS. **Wheat Streak Mosaic**, MN.

## WILDRYE (*Elymus*)

LEAF SPOT. **Pyrenophora trichostoma**, ND; **Septorium spraguei**, ND.

# Z

ZOYSIA (Japanese Lawn Grass)

BLIGHT, Foliar. **Curvularia lunata**, NC.

DEAD SPOT, Spring. **Ophiosphaerella korrae**, NC.

LEAF YELLOWING, Root Mass Reduction. **Gaeumannomyces graminis** var. **graminis**.

NEMATODE, Pseudo Root Knot. **Hypsoperine graminis**, MD.

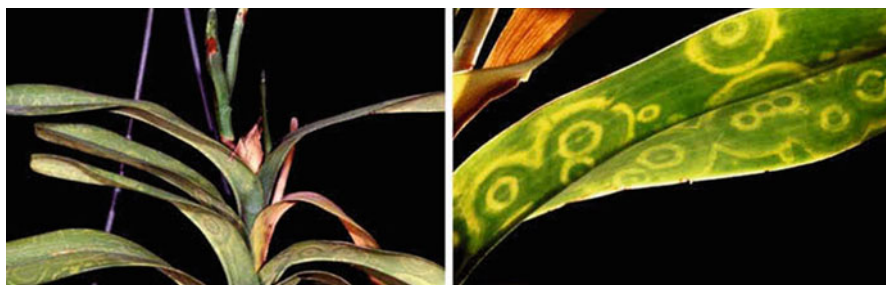
ROT, Root and Crown. **Rhizoctonia solani**, MD; **Helminthosporium tetramera**;

**Curvularia** spp.; **Fusarium** spp.; **Gaeumannomyces graminis** var. **graminis**, TX.

RUST. **Puccinia zoysiae**, AL, AR, FL, GA, LA, MD, MO, MS, TX.

**Part IV**  
**Native Flowers and Weeds**

## Illustrations



**Plate 1** Ringspot on Vanda Orchid caused by Vanda Ringspot Virus



**Plate 2** Rust on Jack-in-the-Pulpit caused by *Uromyces caladii*

# A

ACROPTILON REPENS (Knapweed, Russian)

LEAF SPOT. **Cercospora acroptili**, MT.

RUST. **Puccinia acroptili**, CO, MT, WY.

ACTINOMERIS (Yellow Ironweed)

LEAF SPOT. **Cercospora anomala**, IA; **Gloeosporium** sp., WV.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA to VA, KS.

RUST. **Puccinia verbesinae** (0, I, II, III), ME, MD, TN.

VIRUS. **Tobacco Ring Spot**, VA.

ADOXA (Musk-Root)

GALL, Leaf. **Synchytrium anomalum**, IA.

LEAF SPOT. **Phyllosticta adoxae**, CO.

RUST. **Puccinia adoxae** (III), CO, UT, WY; **P. argentata** (0, I), IA, MN, WI. II, III on impatiens.

AEGOPODIUM (Bishop's Weed)

VIRUS. **Tomato Spotted Wilt**, PA.

AESCHYNOMENE (Northern Joint-Vetch)

CANKER, Stem. **Diaporthe phaseolorum** var. **caulivora**, LA.

AGASTACHE (Giant-Hyssop)

DOWNY MILDEW. **Peronospora lophanthi**, IL, IA, WI.

LEAF SPOT. **Ramularia lophanthi**, CA, MT; **Septoria lophanthi**, IL, MO, OH, WI.

LEAF SPOT; Stem Spot. **Ascochyta lophanthi**, IL, IA, WI.

POWDERY MILDEW. **Sphaerotheca macularis** (*S. humuli*), MO, UT, WA, WI.

RUST. **Puccinia hyssopi** (III), NY to IA, MO, WI.

VIRUS. **Mosaic**. Unidentified, IN.

WILT. **Verticillium dahliae**, IA.

AGRIMONY (*Agrimonia*)

BLIGHT, Stem. **Phoma herbarum**, TX.

DOWNY MILDEW. **Peronospora potentillae**, IA, NY, WI.

LEAF SPOT. **Cercospora** sp., IL; **Phyllosticta decidua**, NC, WI; **Septoria agrimoniae**, IL, IN, IA, MO, NY, NC, TX, WI; **S. agrimoniae-eupatoriae**, IA.

POWDERY MILDEW. **Sphaerotheca macularis**, MA, NE, NC, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia agrimoniae** (II, III), MO; 0, I unknown; **Pucciniastrum agrimoniae** (II, III), general ME to FL, NM, ND; 0, I unknown.

VIRUS. **Mosaic**. Unidentified, NY.

ALLIARIA (Garlic Mustard)

ROT, Root. **Fusarium solani**, IL.

VIRUS. **Cucumber Mosaic**, OH.

AMARYLLIS, WILD (*Nothoscordum bivalve*; *N. inodorum*)

VIRUS. **Nothoscordum Mosaic**, LA.

ANAPHALIS (Pearl Everlasting)

LEAF SPOT. **Septoria margaritaceae**, NY, OR, WI.

RUST. **Uromyces amoenus** (III), CA, ID, MI, MT, OR, WA, WY.

ANEMONE (Native Species)

DOWNY MILDEW. **Plasmopara pygmaea**, widespread.

GALL. **Synchytrium anemones**, IA MA, MI, MN, VT, WI.

LEAF SPOT. **Cercospora pulsatillae**, CO; **Cercospora filiformis**, WI; **Didymaria didyma** IA MI WI; **Phloeospora anemones** IA; **Phyllosticta anemonicola**, IL, MI, ME, NE, VA, WI; **Ramularia ranunculi**, NY, WI; **Septoria anemones**, IL, IA, MS, MO, TX, VT, WI; **S. cylindrica**, MT, VA; **S. punicea**, KS, MA, MI, MS, NE.

POWDERY MILDEW. **Erysiphe polygoni**, IL, IA, IN, MI, MN, NJ, ND, WI.

RUST. **Puccinia anemones-virginianae** (III), ME to MS to NE, ND; **P. gigantispora** (0, I, III), CO, IL, ID, MT, ND, WI, WY; **P. magnusiana** (0, I), NY to KS, ND; II, III on reed grasses; **P. pulsatillae** (III), CO, IA, ND, SD; **P. recondita** (0, I), NY to TX; II, III on grasses; **P. retecta**, AK, CO; **P. vesiculosa**, AK; **Tranzschelia cohaesa** (0, I, II, III), TX; **T. pruni-spinosae** (0, I), IA, KS, NE to TX, AL; II, III on *Prunus* spp.; **T. fusca** (0, III), MA to VA, CA, and Northwest; **T. suffusca** (0, III), CO, IA, MT, ND, SD; **T. tucsonensis** (0, I, II, III), AZ.

SMUT, Leaf and Stem. **Urocystis anemones**, ME to AK, DE, CO, KS, IA, MN, ND, WI; **U. sorosporioides**, AK.

SMUT, White. **Entyloma ranunculi**, WI.

VIRUS. **Cucumber Mosaic**, AR.

ANGELICA

LEAF SPOT. **Cercospora apii** var. **angelicae**, AK; **C. thaspiae**, AL, TX; **Fusicladium angelicae**, general; **Gloeosporium angelicae**, SC; **Phyllosticta angelicae**, CA, WY; **Piggotia depressa**, MT; **Ramularia angelicae**, CO; **Septoria dearnessii**, NC, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia angelicae** (0, I, II, III), NY, OR, PA, WA; **P. bistortae**, AK; **P. coelopleuri** (0, I, II, III), AK; **P. ellisii**, CA, ID, NV, OR, WA; **P. ligustici**, CO, WA; **P. poromera**, UT.

#### ANODA

NECROSIS, Vascular. **Verticillium dahliae**, NM.

NEMATODE, Cyst. **Meloidogyne hapla**.

POWDERY MILDEW. **Oidium erysipheoides**, NM.

RUST. **Puccinia** sp., TX.

#### APPLE-OF-PERU (*Nicandra*)

LEAF SPOT. **Cercospora physaloides**, IN.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Mosaic**. Unidentified, ID, IA, KY, WA, WI. Experimentally infected with several viruses; **Tomato Leaf Curl**, CA, Mexico.

#### AQUATIC PLANTS (*Caboriaba* sp., *Limnophila* sp., *Replis diandra*, and *Potamogeton* sp.)

NEMATODE, Foliar. **Aphelenchoides fragariae**, FL.

#### ARNICA

LEAF SPOT. **Ovularia hughesiana**, MT; **Phyllosticta arnicae**, CO, MT, UT, WY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CO; **Sphaerotheca macularis** (*S. humuli* var. *fuliginea*), AK, CA, WA, WY.

RUST. **Puccinia arnicalis** (II III) AK, to MT, CA, CO; 0, I unknown; **Uromyces junci** (0, I), CA, CO, MT, OR, SD, WY; II, III on *Juncus* spp.

SMUT, White. **Entyloma arnicale**, AK, CO, ID, MT, UT, WA, WY.

#### ARROW-ARUM (*Peltandra*)

LEAF SPOT. **Cercospora callae**, AL, DE, FL, NY; **Colletotrichum** sp., AL;

**Gloeosporium paludosum**, DE, IN, MA, NY; **Pestalotia aquatica**, secondary;

**Ramularia** sp., MI.

RUST. **Uromyces ari-triphylli** (*U. caladii*) (0, I, II, III), MA to FL, IL, IN, IA.

#### ARROWHEAD (*Sagittaria*)

LEAF SPOT. **Cercospora alismatis** VT to AL, TX, WI; **Didymaria alismatis**,

**Gloeosporium confiuens**, IA, MA, TX, WI; **Marssonina** sp., LA.

SMUT, Leaf. **Burrillia pustulata**, IL, NE, WI; **Doassansia deformans**, MA to NJ,

FL, MO, SD, TX; **D. furva**, WI; **D. intermedia**, IA, MN, NH, ND, WI; **D.**

**obscura**, CT, MA; **D. opaca**, MA to DE, IL, WI; **D. sagittariae**, CT to KS, AR,

MT, TX, WY.

#### ARTILLERY PLANT, ALUMINUM PLANT (*Pilea*)

BACTERIAL Leaf Spot. **Xanthomonas campestris**, FL.

BLIGHT, Leaf, Stem, and Bud. **Phytophthora parasitica**, FL.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.



LEAF SPOT. **Myrothecium roridum**, FL; **Septoria pileae**, IL, IN, IA, MI, MO, NY, WI.

ROT. **Rhizoctonia** sp., FL.

ARUGULA (*Eruca sativa*)

BACTERIAL Blight. **Pseudomonas syringae** pv. **alisalensis**, CA, NV.

BACTERIAL Leaf Spot. **Pseudomonas syringae**, CA.

DOWNY MILDEW. **Peronospora parasitica**, CA.

WHITE RUST. **Albugo candida**, CA.

ASPARAGUS (*Asparagus officinalis*)

ANTHRACNOSE; Canker. **Colletotrichum** sp., AL, CT, IL.

BACTERIAL Soft Rot. **Erwinia carotovora**, general.

BLIGHT, Branchlet; DIEBACK. **Alternaria** sp., IL, MA, NY, OK, SC; **Stemphylium botryosum**, secondary; **Ascochyta** sp., DE, TX.

BLIGHT, Ashy Stem. **Macrophomina phaseoli**, TX.

BLIGHT, Gray Mold, Shoot. **Botrytis cinerea**, CA, IL, MA, NY, WV.

CANKER; Stem Spot. **Phoma asparagi**.

DAMPING-OFF; Stem Canker. **Rhizoctonia solani**, occasional.

LEAF SPOT. **Cercospora asparagi**, general; **Pleospora herbarum**; **P. allii** Anamorph, **Stemphylium vesicarium**, MI, OK, WA.

NEMATODE, Root Knot. **Meloidogyne** sp., SC. Usually resistant.

ROT, Crown. **Penicillium martensii**, WA; **Penicillium** sp., blue mold rot.

ROT, Mushroom Root. **Armillaria mellea**, OR.

ROT, Root; Stem Wilt; Decline. **Fusarium oxysporum** f. sp. **asparagi**, CA, SC, WA; **Fusarium proliferatum**, CT; **Fusarium** sp.; **Phytophthora** sp., MI; **P. megasperma**, Montreal, Canada; **P. asparagi**, MI.

ROT, Stem. **Diplodia asparagi**; **Phytophthora** sp., CA.

ROT, Watery Soft. **Sclerotinia sclerotiorum**, occasional in South.

RUST. **Puccinia asparagi** (0, I, II, III), general on susceptible varieties. Rust is the most important asparagus disease, and resistant varieties are sometimes disappointing.

VIRUS. Asparagus I, DE, MI, NJ; Asparagus II, DE; Tobacco Streak.

ASPARAGUS FERN (*Asparagus plumosus*)

CANKER, Stem; Blight. **Ascochyta asparagina**, FL, TX; **Phoma** sp., FL.

LEAF MOLD. **Cladosporium** sp., FL, MS, TX.

NEMATODE, Root Knot. **Meloidogyne** spp., FL.

NEMATODE, Spiral. **Helicotylenchus nannus**.

NONPARASITIC "Rust". Cause undetermined, FL.

ROT, Root; Wilt. **Fusarium** sp., FL, WA.

ASTRAGALUS

RUST. **Uromyces punctatus**, ID, OR.

RUST, Soybean. **Phakopsora pachyrhizi**, Southern U.S.

## B

BALSAM-APPLE, BALSAM-PEAR (*Momordica*)  
ANTHRACNOSE. **Colletotrichum lagenarium**, IN.  
DOWNY MILDEW. **Pseudoperonospora cubensis**, IA.  
LEAF SPOT; Blight. **Ramularia momordicae**, TX.  
NEMATODE, Burrowing. **Radopholus similis**, FL.  
NEMATODE, Root Knot. **Meloidogyne** sp., FL.  
POWDERY MILDEW. **Golovinomyces cichoracearum**, WI.

BALSAM-ROOT (*Balsamorhiza*)  
LEAF SPOT. **Septoria** sp., WA.  
NEMATODE, Leaf Gall. **Anguina balsamophila**, UT.  
POWDERY MILDEW. **Golovinomyces cichoracearum**, WY.  
RUST. **Puccinia balsamorhizae** (0, I, II, III), general.

BANEBERRY, COHOSH (*Actaea*)  
LEAF SPOT. **Ascochyta actaeae**, WI; **Ramularia actaeae**, CO, IA, NM, VT, WI.  
RUST. **Puccinia recondita** (0, I), NY to VA, IL, WA; II, III on grasses.  
SMUT, Leaf and Stem. **Urocystis carcinodes**, ID, PA, UT, WV.

BAPTISIA (False Indigo)  
LEAF SPOT. **Cercospora velutina**, IL, KS, WI; **Marssonina baptisiae**, IA; **Septoria baptisiae**, SC, TX; **Stagonospora baptisiae**, SC.  
POWDERY MILDEW. **Erysiphe polygoni**, prevalent; **Microsphaera alni**, WI.  
ROT, Root. **Armillaria mellea**, CA; **Phymatotrichum omnivorum**, TX.  
RUST. **Puccinia andropogonis**, KS, NE, NC, OK.  
RUST, Soybean. **Phakopsora pachyrhizi**, southern U.S.

BARREN-STRAWBERRY (*Waldsteinia*)  
LEAF SPOT. **Ramularia waldsteiniae**, WI; **Septoria waldsteiniae**, MI, NY, VT.  
RUST. **Puccinia waldsteiniae**, ID, MI, NY, VT, WI.  
SMUT. **Urocystis (Whetzella) waldsteiniae**, NY, WI.

BARRENWORT (*Epimedium*)

VIRUS. **Tobacco Rattle**, MA, MI, MN.

BASIL (*Ocimum*)

BACTERIAL Leaf Spot. **Pseudomonas cichorii**, LA; **P. viridiflava**, CA.

BLACK Leg. **Pleotosporium tabacinum**, IN.

DOWNY MILDEW. **Peronospora** sp., CA, FL, MA.

NEMATODE, Root Knot. **Meloidogyne** sp., FL; **M. incognita acrita**, CA.

NONPATHOGENIC. Hydroponically grown chlorosis (interveinal), CO<sub>2</sub> enrichment, IL.

ROT, Basal. **Rhizoctonia solani**, HI.

ROT, Root. **Phytophthora dreschleri**, NC; **Pythium irregulare**, FL.

ROT, Stem. *Sclerotinia sclerotiorum*, LA, also dieback, CA; *S. minor*, CA, also crown.

SPOT, Black. **Colletotrichum gloeosporioides**, FL.

VIRUS. **Bromegrass Mosaic Virus**, general, IA, SD; **Tomato Spotted Wilt**, LA, PA.

WILT. **Fusarium oxysporum** f. sp. **basilicum**, CA, FL, HI, LA, MD, MA, SC; **Sclerotinia sclerotiorum**.

BEAN, TEPARY (*Phaseolus acutifolius*)

BLIGHT, Southern. **Sclerotium rolfsii**, AL.

POWDERY MILDEW. **Erysiphe polygoni**, CA.

ROT, Root. **Fusarium solani**, CA; **Phymatotrichum omnivorum**, TX.

RUST. **Uromyces phaseoli** (II, III), CA, TX.

VIRUS. **Beet Curly Top**, CA.

BEGGARWEED, FLORIDA (*Desmodium tortuosum*)

RUST. **Phakopsora pachyrhizi**, GA.

VIRUS. **Tomato Spotted Wilt**, GA.

BELLS-OF-IRELAND (*Molucella*)

LEAF SPOT. **Cercospora apii**, CA, Texcoco, Mexico.

ROT, Crown. **Myrothecium** sp., TX.

BIDENS (*Bur-Marigold*)

BACTERIAL, MLO. **Aster Yellows**, CA.

POWDERY MILDEW. **Sphaerotheca macularis**, general.

RUST. **Uromyces bidenticola** (0, I, II, III), CA, FL, NM.

VIRUS. **Bidens Mottle**, FL.

BINDWEED, FIELD (*Convolvulus*)

POWDERY MILDEW. **Erysiphe convolvuli** var. **convolvuli**, General, N. America.

BISHOPS-CAP (*Mitella*)

LEAF SPOT. **Cercospora mitellae**, MI; **Phyllosticta mitellae**, NY, WI; **Ramularia mitellae**, IL, IN, MI, NY; **Septoria mitellae**, MI, WI.

POWDERY MILDEW. **Sphaerotheca macularis**, WI.

ROT, Leaf. **Sclerotium deciduum**, WI.

RUST. **Puccinia heucherae** (III), widespread.

BITTERCRESS (*Cardamine*)ROT. **Sclerotinia minor**, NC.BLACK BEARBERRY (*Arctous*)RUST. **Pucciniastrum sparsum** (II, III), AK.BLEEDING-HEART (*Dicentra spectabilis*)ROT, Stem. **Sclerotium rolfsii**, NY; **Sclerotinia sclerotiorum**, MN.VIRUS. **Tobacco Rattle**, MA, MI, MN.WILT. **Fusarium** sp., NJ.

## BLEPHILIA (Wood Mint, Downy Pagoda Plant)

LEAF SPOT. **Cercoseptoria blephiliae**, WI; **Septoria menthicola**, WI.RUST. **Puccinia menthae** (0, I, II, III), IL, IN, IA, MD, MI, MO, TN, WI.VIRUS, Mottling. **Cucumber Mosaic**, AR.BLOODROOT (*Sanguinaria*)BLIGHT, Gray Mold. **Botrytis cinerea**, NY.LEAF SPOT. **Cercospora sanguinariae**, MD, MO, NY, PA, TX, WI; **Cylindrosporium circinans**, MD, MO, WI; **Gloeosporium sanguinariae**, OH, TX; **Phyllosticta sanguinariae**, MO, TX, WV.BLUE COHOSH (*Caulophyllum*)BLIGHT, Leaf. **Botrytis streptothrix**, NJ, NY.LEAF SPOT. **Cercospora caulophylli**, VT to VA, MO, WI.BLUE CURLS (*Trichostema*)LEAF SPOT. **Septoria trichostematis**, NY.BLUE-EYED GRASS (*Sisyrinchium*)BLIGHT, Leaf. **Kellermania sisyrinchii**, CA, NM, ND.NEMATODE, Lesion. **Pratylenchus pratensis**.RUST. **Uromyces houstoniatus** (II, III), ME, WV; 0, I on *Houstonia* spp.; **U. Probus** (I, II, III), ID, OR, TX, UT, WA; **Aecidium residuum** (0, I), OK, TX.

## BOISDUVALIA

RUST. **Puccinia glabella** (II, III), NV, OR, UT; 0, I unknown; **P. oenotherae** (0, I, II, III), CA, ID, NV, OR, WA; **P. vagans** var. **epilobi-tetragoni** (0, I, II, III), CA, ID, NV, OR, UT.

## BRYONOPSIS

BACTERIAL Spot. **Pseudomonas lachrymans**, WI.DOWNY MILDEW. **Pseudoperonospora cubensis**, MA, OH.BUGLEWEED (*Ajuga*)BLIGHT, Southern; Crown Rot. **Sclerotium rolfsii**, CA, CT, KS, NJ, NY. Serious in warm, muggy weather.NEMATODE, Southern Root Knot. **Meloidogyne incognita**, GA.ROT, Crown and Root. **Phoma** sp. GA.VIRUS. **Cucumber Mosaic**, OH; **Tobacco Streak**, OH.

BUNCHFLOWER (*Melanthium*)LEAF SPOT. **Septoria allardii**, VA.RUST. **Puccinia atropuncta** (II, III), NC, TN, VA.BURNET (*Sanguisorba*)LEAF SPOT. **Graphium sessile**, NY; **Ovularia bulbiger**, AK, IL.POWDERY MILDEW. **Podosphaera oxyacanthae**, IA; **Sphaerotheca macularis**, AK, MA, NY, PA.RUST. **Xenodochus carbonarius** (I, III), AK; **X. minor**, AK.BUTTERFLY PEA (*Centrosema*)LEAF SPOT. **Cercospora clitoriae**, AL; **Colletotrichum** sp., on pods.BUTTERFLY WEED (*Asclepias*)BACTERIAL Blight. **Xanthomonas campestris** pv. **asclepiadis**, NE.BLIGHT, Stem. **Phoma asclepiadea**, UT.LEAF SPOT. **Cercospora asclepiadora**, AL, TX; **C. clavata**, general; **C. venturioides**, WA; **Phyllosticta tuberosa**, IL, NJ.ROT, Root. **Phymatotrichum omnivorum**, TX.RUST. **Puccinia bartholomaei** (0, I), ND, SD; II, III on *Spartina*; **Uromyces asclepiadis** (II III), widespread.

# C

CACTUS (*Cereus*)

ANTHRACNOSE. **Mycosphaerella opuntiae**, TX. BACTERIAL Soft Rot. **Erwinia carotovora**, TX.

BLIGHT, Gray Mold; Rot. **Botrytis cinerea**, occasional when too damp, indoors.

LEAF SCORCH. **Hendersonia opuntiae**, TX.

LEAF SPOT, Black. **Diplothea** (*Stevensea*) **wrightii**, TX; Stem, **Septoria cacticola**, TX.

NEMATODE, Cyst. **Heterodera cacti**; **Nacobbis batatiformis**.

NEMATODE, Root Knot. **Meloidogyne** sp.

ROT, Dry. **Poria** sp., CA.

ROT, Stem and Branch. **Aspergillus alliaceus**, TX.

ROT, Root and Stem. **Fusarium oxysporum**, AZ, CA; **Helminthosporium cactorum**, CA, TX; **Phymatotrichum omnivorum**, TX.

CACTUS (*Leuchtenbergia principis* and *Schlumbergera gaertneri* “*Makoyana*”)

NEMATODE, Cyst. **Heterodera cacti**.

VIRUS. **Tomato Spotted Wilt**, PA.

CACTUS, FISHHOOK, PINCUSHION (*Mammillaria*)

ANTHRACNOSE; Zonate Spot. **Gloeosporium cactorum**; **Mycosphaerella opuntiae**; Spine Spot, **Phoma mammillariae**, MT.

NEMATODE, Root Knot. **Meloidogyne incognita**, Bermuda Bot. Gard; **Meloidogyne** sp., TX; Cyst, **Heterodera cacti**.

ROT, Root. **Phymatotrichum omnivorum**, TX.

CACTUS, GIANT, SAGUARO (*Carnegiea*)

BACTERIAL Blight. **Erwinia carnegieana**, AZ.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, AZ.

ROT, Dry. **Poria carnegieae**; Heart, **Fomes robustus**.

ROT, Seedling. **Fusarium solani**; **F. oxysporum**.

VIRUS. **Saguaro Cactus**, AZ.

The bacterial blight is spread over the whole giant cactus area in Arizona, with mortality heaviest in magnificent specimens 150–200 years old.

CACTUS, STAR, SEA-URCHIN, BARREL (*Echinocactus*)

ANTHRACNOSE. **Mycosphaerella opuntiae**, TX.

LEAF SCORCH; Scald. **Hendersonia opuntiae**, TX.

LEAF SPOT, Black. **Diplothea** sp., TX.

ROT, Root. **Phymatotrichum omnivorum**, TX; Stem, **Aspergillus alliaceus**, TX.

CALENDULA (Pot Marigold)

BACTERIAL, MLO. **Aster Yellows**, CT, DE, ME, NJ, PA, VA; **California Aster Yellows**, CA.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK, MO, NJ, NY.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Alternaria** sp., NY; **Cercospora calendulae**, PA, TX, VA; **Colletotrichum gloeosporioides**, VA.

NEMATODE, Root Knot. **Meloidogyne** spp., TN, TX, WV; **M. javanica**.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, NY; **Erysiphe polygoni**, PA.

ROT, Root. **Rhizoctonia solani**, IN, NJ, NC, TX; **Pythium ultimum**, CA; **Phymatotrichum omnivorum**, TX.

ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, CA, FL, LA, MO, OH, TX.

RUST. **Puccinia flaveriae** (III), IL, IN, IA, KS, MO, NE, TX.

SMUT, White. **Entyloma calendulae**, CA, NH, OR; **E. compositarum**, WA.

VIRUS. **Cucumber Mosaic**, **Tomato Spotted Wilt**, CA, MI, TX; **Bidens Mottle**, FL.

CALIFORNIA-BLUEBELL (*Phacelia*)

LEAF SPOT. **Cylindrosporium phaceliae**, MT, TX.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, MT, NM, TX.

RUST. **Puccinia aristidae** (0, I); II, III on wild grasses; **P. phaceliae** (III); **P. recondita** (0, I), MT to CO, CA, NM, OR; II, III on brome grass; **Uredo contraria** (II), CA.

VIRUS. **Beet Curly Top**, CA.

CALIFORNIA PITCHER-PLANT (*Darlingtonia*)

LEAF SPOT. **Mycosphaerella sarraceniae**, CA; **Septoria darlingtoniae**, OR.

CALIFORNIA-ROSE (*Convolvulus japonicus*)

LEAF SPOT. **Phyllosticta batatas**, SC; **Septogloeum convolvuli**, CA, WI; **Septoria calystegiae**, CA; **S. convolvuli**, WI; **S. flagellaris**, NY.

RUST. **Coleosporium ipomoeae** (II, III), LA, MA, 0, I on pine; **Puccinia convolvuli** (0, I, II, III), CA, OR.

CALLA, WILD (*Calla palustris*)

LEAF SPOT. **Cercospora callae**, MA, NY, WI; **Marssonina callae**, NY.

CAMOMILE (*Anthemis*)

BACTERIAL, MLO. **California Aster Yellows**, CA.

DAMPING-OFF. **Rhizoctonia solani**, WA.

NEMATODE, Root Knot. **Meloidogyne** sp., FL, MD.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.

CAPE-MARIGOLD (*Dimorphotheca*)

BACTERIAL, MLO. **Aster Yellows**, NJ, NY.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK, CT.

DOWNY MILDEW. **Plasmopara halstedii**, IA, ND.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

ROT, Charcoal. **Macrophomina phaseoli**, CA.

ROT, Root. **Pythium ultimum**, CA; **Rhizoctonia solani**, IL.

RUST. **Puccinia flaveriae** (III), IL, IN, NE, NJ.

VIRUS. **Curly Top Virus (Beet)** on *Dimorphotheca pluvialis* var. *fingens* and  
*D. sinuata*.

WILT. **Fusarium** sp., FL.

CAPEWEED, CAPE DANDELION (*Arctotheca calendula*)

BLIGHT; ROT, Root, Crown and Stolon. **Sclerotium rolfsii**, CA.

CAROLINA GERANIUM (*Geranium carolinianum*)

BLIGHT, Stem and Leaf. **Sclerotinia minor**, NC.

VIRUS. **Tomato Spotted Wilt**, GA.

CARPETWEED (*Mollugo*)

VIRUS. **Tomato Spotted Wilt**, GA.

CARROT, WILD (*Daucus carota*)

VIRUS. **Alfalfa Mosaic**, WA; **Clover Yellow Vein**, WA.

CASCARA (*Ramnus ramorum*)

LEAF SPOT, Black. **Phytophthora ramorum**, CA.

CASTOR-BEAN (*Ricinus communis*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**.

BACTERIAL Leaf Spot. **Xanthomonas ricinicola**, MD, OK, TX.

BACTERIAL Wilt. **Pseudomonas solanacearum**, AL, FL, GA, MI.

BLIGHT, Inflorescence; Gray Mold. **Botryotinia ricini**, GA to FL, TX.

BLIGHT, Southern. **Sclerotium rolfsii**.

DAMPING-OFF. **Rhizoctonia solani**, FL, KS.

GALL. **Synchytrium** sp., TX.

LEAF SPOT. **Alternaria** sp., FL, LA, TX; **Cercospora canescens**, AL, KS, MT;

White Spot, **C. ricinella**; **C. coffeicola**, Brazil; **Corynespora cassiicola**.

NEMATODE, Root Knot. **Meloidogyne** sp., OK.

NEMATODE, Burrowing. **Radopholus similis**, FL.

ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, FL; **Phytophthora parasitica**, FL.

CAT-TAIL (*Typha*)

LEAF SPOT. **Stagonospora typhoidearum**, TX, WI; **Phyllosticta typhina**, NE, NY,

OR, TX, WI; **Scolecotrichum typhae**, CO.



MOLD, Leaf. **Cladosporium** spp., general.

ROT, Culm. **Ophiobolus** sp., AR.

ROT, Leaf. **Phythiogeton autossytum**, OH; **Pythium helicoides**, OH.

CELANDINE (*Chelidonium*)

LEAF SPOT. **Septoria chelidonii**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

CELTUCE (*Lactuca serriota* var. *sativa*)

DOWNY MILDEW. **Bremia lactucae**, ND, PA, WA.

LEAF SPOT. **Septoria lactucae**.

ROT, Watery Soft; Drop. **Sclerotinia sclerotiorum**, MA.

Celtuce is a kind of lettuce and subject to some of the same diseases.

CENTAUREA (Bachelors-Button, Basketflower, Cornflower, Dusty-miller, Yellow Starthistle)

BACTERIAL, MLO. **Aster Yellows**, widespread; **California Aster Yellows**, CA.

BLIGHT, Southern. **Sclerotium rolfsii**, CT, MD, NJ, TX.

CROWN GALL. **Agrobacterium rhizogenes**, OR.

DIEBACK, Stem. **Pseudomonas syringae**, MT.

DODDER. **Cuscuta** sp.

DOWNY MILDEW. **Bremia lactucae**, CA; **Plasmopara halstedii**, IA, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., CA, FL, OH.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, CT.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Pythium** sp.; **Rhizoctonia solani**, IL, IN, NJ, NY, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, CA, IN, MS, MO, TX; **Phytophthora cactorum**, NY.

RUST. **Puccinia cyani** (0, I, III), MA to NC, CA, IN, OR, WA; **P. irrequiseta** (II, III), TX; 0,1, unknown; **P. jaceae** var. **diffusa**; **P. acriptili**, NM; **P. jaceae** var. **solstitiales**, CA.

VIRUS. **Tomato Spotted Wilt**, PA.

WHITE RUST. **Albugo tragopogonis**, TX.

WILT. **Verticillium albo-atrum**, NY.

WILT, Stem Rot. **Fusarium oxysporum** f. sp. **callistephi**, MI.

CHAEROPHYLLUM

BROOMRAPE. **Orobanche ramosa**, TX.

CHENOPODIUM

DAMPING-OFF. **Sclerotium rolfsii**, CA.

NEMATODE, Cyst. **Cactodera milleri**, WI.

VIRUS. **Sowbane Mosaic**, CA. Commonly used as test plant (bioassay) for viruses.

CHICKWEED (*Stellaria* and *Cerastium*)

ROT. **Sclerotinia minor**, NC; **Sclerotium rolfsii** (stem), NC.

RUST, Broom. **Melampsorella caryophyllacearum**, NY.

VIRUS. **Tomato Ringspot**, PA; **Tomato Spotted Wilt**, GA.

## CHIRITA

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

## CHLOROGALUM (Soap-Plant)

LEAF SPOT. **Heterosporium gracile**, CA.

RUST. **Uromyces aureus** (0, I, III), CA.

CHRISTMAS CACTUS (*Zygocactus truncatus*)

ROT, Basal Stem. **Fusarium oxysporum**, MA.

ROT, Root. **Phytophthora parasitica**, FL.

VIRUS. **Zygocactus Montana X**, MT.

## CHRYSOPSIS (Golden Aster)

LEAF SPOT. **Cercospora macroguttata**, AL, MS; **Ramularia chrysopsidis**, NY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, MT, WY.

RUST. **Coleosporium asterum** (II, III), CO, FL, NE; 0, I on pine; **Puccinia grindeliae** (III), CA, CO, OK, UT, WY; **P. stipae** (0, I), AZ, CO, FL, MT, NE, WY; II, III on grasses.

## CIRSIUM (Plumed Thistle)

LEAF SPOT. **Alternaria chrysanthemi**, MT; **Cercospora** spp.; **Phyllosticta cirsii**; **Septoria cirsii**, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general; **Sphaero theca macularis**.

ROT, Root. **Rhizoctonia solani**, IL; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia cirsii** (0, I, II, III), PA to NC, CA, TX, OR; **Uromyces junci** (0, I), MT, NE, ND.

SMUT, Inflorescence. CO, UT.

WHITE RUST. **Albugo tragopogonis**, NY to IA, TX, WY.

## CLAYTONIA (Spring Beauty)

DOWNY MILDEW. **Peronospora claytoniae**, CA, IA, MD, TX, WA.

GALL, Leaf. **Physoderma claytoniana**; MI, WI.

LEAF SPOT. **Ramularia claytoniae**, CA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia marie-wilsoniae** (0, I, III), NH to VA, CO, MO, UT, WA, WI; **P. agnita** (0, III); **Uromyces claytoniae** (0, I, III), NY.

VIRUS. **Spring Beauty Latent**, AR.

## CLEOME (Spider-Flower)

DOWNY MILDEW. **Peronospora parasitica**, LA.

LEAF SPOT. **Cercospora cleomis**, MI, NJ; **C. conspicua**; **Heterosporium hybridum**, IA, MT.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Leveillula taurica**, North America.

RUST. **Puccinia aristidae** (0, I), AZ, CO, IN, MT, NE, NM; II, III on grasses.

## CLINOPODIUM (Basil-Weed)

LEAF SPOT. **Phyllosticta deciduas**, NY.RUST. **Puccinia menthae** (0, I, II, III), MA to VA, CO, WI.

## CLINTONIA

GALL, Leaf; False Rust. **Synchytrium aureum**, WI.ROT, Leaf. **Ceratobasidium anceps**, ME, NY, WI.RUST. **Puccinia mesomajalis** (III), CA, ID, MI, MN, MT, NH, NY, OR, TN, VA, WA, WI.COCKLEBUR (*Xanthium*)DOWNY MILDEW. **Plasmopara halstedii**, ND.NEMATODE, Root Knot. **Meloidogyne hapla**.ROT, Stem. **Sclerotinia trifoliorum**, MD; **S. sclerotiorum**, MD; **S. minor**, MD.RUST. **Puccinia canaliculata**, KS; **P. xanthii**, KS.

## CODONANTHE

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

## COLLINSONIA (Horse-Balm)

BLACK SPOT, on stem. **Phyllachora** sp., PA.COLTSFOOT (*Tussilago*)LEAF SPOT. **Mycosphaerella tussilaginis**, NY; **Septoria farfaricola**, TN.COLUMBO (*Frasera*)LEAF SPOT. **Asteroma fraseriae**, black mildew, CO, ID; **Cercospora fraseriae**, CO, UT; **Marssonina fraseriae**, ID, WA; **Phyllosticta fraseriae**, CO.RUST. **Uromyces speciosus** (II, III), CO, NM; 0, I, unknown.COMMELINA (*C. diffusa*)VIRUS. **Aneilema Mosaic**, FL; **Commelina Mosaic**, FL; **Cucumber Mosaic**, FL; **Tradescantia/Zebrinia Mosaic**, FL.CORNCOCKLE (*Agrostemma*)LEAF SPOT. **Gloeosporium** sp., IN; **Marssonina delastrei**, IL, IN, MI, MS, MO; **Septoria lychnidis** var. **pusilla**, ND.ROT, Root. **Phymatotrichum omnivorum**, TX.ROT, Stem. **Fusarium** sp., IN.

## CORYDALIS

DOWNY MILDEW. **Peronospora corydalis**, IN, MD, MA, OK, TX.LEAF SPOT. **Septoria corydalis**, TX, WI.NEMATODE. **Meloidogyne** sp., FL.RUST. **Puccinia aristidae** (0, I), CO, KS, NE; II, III on grasses; **P. brandegei** (III) CO, WA.CROTON (*Croton*)DODDER. **Cuscuta indecora**, TX.GALL, Leaf. **Kutilakesa pironii**, FL.

LEAF SPOT. **Cercospora capitati**, TX; **C. crotonicola**, SC, TX; **C. crotonis**, AL, FL, SC; **C. crotonophila**, WI; **C. maritima**, MS; **C. crotonifolia**, SC.

NEMATODE, Lesion. **Pratylenchus** sp., FL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Bubakia crotonis** (II, III), KY to AL, AZ, CA, FL, NE, TX.

#### CRYPTANTHA

GALL, Leaf. **Synchytrium myosotidis**, AZ, CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, NV.

RUST. **Puccinia aristidae** (0, I); II, III on native grasses; **P. cryptanthes**, CA, WA.

#### CYNOGLOSSUM (Hounds-Tongue)

BLIGHT, Southern. **Sclerotium rolfsii**, FL.

DOWNY MILDEW. **Peronospora cynoglossi**, IL, MD, TX.

LEAF SPOT. **Cercospora cynoglossi**, IN; **Phyllosticta decidua**, WI; **Ramularia lappulae**, TX, WI.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Golovinomyces cichoracearum**, UT, VA, WY.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, WA, British Columbia, Canada.

# D

## DAHLIA

- BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT, IL.  
BACTERIAL, MLO. **Aster Yellows**, MD.  
BACTERIAL Rot. *Erwinia carotovora*, MS, WA; *E. cytolitica*, NY.  
BACTERIAL Wilt. *Pseudomonas solanacearum*, DE, MI, MS, NJ, NC, OK, TX.  
BLIGHT, Blossom. *Choanephora americana*, FL; *Stemphylium floridanum*.  
BLIGHT, Gray Mold. *Botrytis cinerea*, cosmopolitan on flower buds.  
BLIGHT, Southern. *Sclerotium rolfsii*, FL, KS, MS, NJ, NC, TX.  
LEAF SPOT. *Alternaria* sp., VA to AL, MO, MI, secondary; *Cercospora* sp., FL, MS.  
NEMATODE, Bulb. *Ditylenchus destructor*, OR.  
NEMATODE, Leaf. *Aphelenchoides ritzemabosi*, CA.  
NEMATODE, Root. *Paratrichodorus pachydermus*, MI.  
NEMATODE, Root Knot. *Meloidogyne* sp., NC to AL, AZ, CA, MO, TX.  
POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Ersiphe polygoni*, CA, DE, GA, IA, MO, NJ, PA, VA; *Uncinula* sp., NC.  
ROT, Charcoal. *Macrophomina phaseoli*, OK, SC.  
ROT, Root. *Armillaria mellea*, CA; *Phymatotrichum omnivorum*; TX.  
ROT, Stem. *Sclerotinia sclerotiorum*, CA, ME, NY.  
ROT, Stem, Root, Cutting. *Pythium* spp.; *Rhizoctonia solani*; *Fusarium roseum*.  
SCAB. *Streptomyces scabies*, NC.  
SMUT, Leaf. *Entyloma dahliae*, CA, NJ, OR.  
VIRUS. **Dahlia Mosaic**, general; **Tomato Spotted Wilt**, CA, MI, NJ, NY, NC, OK, TX, WI; **Cucumber Mosaic**; **Tobacco Ring Spot**.  
WILT. *Fusarium oxysporum*; *Verticillium albo-atrum* (*V. dahliae*) IL, MI, MO, NJ, OH, TX.

Leafhopper injury, hopperburn, looks like a true disease. Margins of leaves turn brown, and there may be general stunting and yellowing. The spotted wilt virus causes yellow ring spots in dahlia foliage. Heavy, wet soil contributes to bacterial and fungus rots and wilts. Mildew is often prevalent in late summer.

DAISY, OXEYE (*Leucanthemum vulgare*)

BACTERIAL, MLO. **Aster Yellows**, KS, NJ, NY.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Cylindrosporium chrysanthemi**, OK; **Septoria chrysanthemella**;  
**S. leucanthemi**, blotch, CT, NY.

NEMATODE, Root Knot. **Meloidogyne** sp.

NEMATODE, Stem. **Ditylenchus dipsaci**, NY.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Fusarium roseum** and **F. solani**, TX; **Sclerotinia sclerotiorum**, TX.

VIRUS. **Potato Yellow Dwarf**, NY.

DALIBARDA (Dewdrop)

LEAF SPOT. **Septoria dalibardae**, ME, MI, NH, NY, VT.

DANDELION (*Taraxacum*)

VIRUS. **Tomato Ringspot**, PA.

DATURA

BACTERIAL Canker, Vascular. **Clavibacter michiganense**, WY. On *Datura* sp.,  
*D. innoxia*, *D. metal*, *D. meteloides*, *D. mollis*, *D. stramonium*.

BLIGHT, Southern. **Sclerotium rolfsii**, FL.

LEAF SPOT; Pod Blight. **Alternaria crassa**, FL, WI.

NEMATODE, Root Knot. **Meloidogyne hapla**.

ROT, Root. **Thielaviopsis basicola**, WI.

VIRUS. **Bromegrass Mosaic**, general; **Tomato Spotted Wilt**, CA, TX; **Potato Leafroll**, Pacific NW.

DAYLILY (*Hemerocallis*)

BLIGHT, Gray Mold. **Botrytis** sp., MD.

BLIGHT, Leaf. **Kabatiella** sp., secondary, MD.

LEAF SPOT. **Cercospora hemerocallis**, IL; **Heterosporium gracilis**, NJ, NY, TX;  
Leaf Streak, **Gloecephalus hemerocalli**, MS, and **Collecephalus hemerocalli**,  
LA, MS, PA.

NEMATODE, Root Knot. **Meloidogyne incognita**.

ROT, Root. **Sclerotium** sp., IN; **Phymatotrichum omnivorum**, TX; **Armillaria gallsia**, SC.

RUST. **Puccinia hemerocallidis**, FL, GA, HI, Costa Rica.

DESMODIUM (Arrowleaf)

VIRUS. **Peanut Mottle**, GA.

DICHONDRA (Lawn-Leaf) Grass Substitute or Weed

BLIGHT, Southern. **Sclerotium rolfsii**, CA.

GALL, Leaf. **Synchytrium edgertonii**, LA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

RUST. **Puccinia dichondrae** (II, III), LA, MS, NC, TX.

VIRUS. **Cucumber Mosaic**, CA.

DIGITARIA (Large Crabgrass)

ROT, Root. **Pythium arrhenomanes**, LA.

DODDER (*Cuscuta*)

PHYTOPLASMA. **Citrus Greening**, FL.

VIRUS. **Tomato Ringspot**, PA.

DODECATHEON (Shooting-Star)

LEAF SPOT. **Heterosporium** sp., AK; **Phyllosticta dodecathei**, TX, WI.

RUST. **Puccinia melanconioides** (0, I, III), CA, OR; **P. ortonii** (0, I, II, III), AK, CA, OR, SD, UT, WA; **P. solheimi** (III) WY; **Uromyces acuminatus** var. **steironematis** (0, I), NE, ND; II, III on marsh grasses.

DOGBANE (*Apocynum*)

LEAF SPOT. **Cercospora apocyni**, north central states, TX, VA; **Phyllosticta apocyni**, IA, MS, NJ, NY, OR, PA, WI; **Septoria littorea**, KS, MI, NE, ND, OH; **Stagonospora apocyni**, IL, IN, IA, NY, WI, VA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia seymouriana** (0, I), IL, IN, KS, NE, NJ, NY, OK, SD; **P. smilacis** (0, I), IL, KS, MD, NC, TN, VA, WI; II, III on smilax.

DRAGONHEAD (*Dracocephalum*)

DOWNY MILDEW. **Peronospora** sp., WI, WY.

BLIGHT, Southern. **Sclerotium rolfsii**, IL, TX.

LEAF SPOT. **Phyllosticta dracocephali**, TX; **Septoria dracocephali**, TX, WI.

DUTCHMANS-BREECHES, SQUIRREL-CORN (*Dicentra*)

DOWNY MILDEW. **Peronospora dicentrae**, IN, MD, MI, MO, NY, VA, WI.

RUST. **Cerotelium dicentrae** (0, I), NY to MD, KS, SD; II, III on wood-nettle.

DUTCHMANS-PIPE (*Aristolochia*)

BLIGHT, Gray Mold. **Botrytis cinerea**, CT, MD.

LEAF SPOT. **Cercospora guttulata**, IL, WV; **Gloeosporium** sp., MA; **Ovularia aristolochiae**, WV; **Phyllosticta aristolochiae**, NJ.

ROT, Root. **Diplodia radicularis**, VA.

DYSCHORISTE

RUST. **Aecidium tracyanum** (0, I), FL.

# E

ECHINACEA (Purple Coneflower)

BACTERIAL, Phytoplasma. **Aster Yellows**, WI.

BLIGHT, Wilt. **Fusarium oxysporum**, SD.

LEAF SPOT. **Cercospora rudbeckii**, IA; **Septoria lepachydis**, WI.

PHYLLODY. **Phytoplasma**, MD.

POWDERY MILDEW. **Golovinomyces cichoracearum**, Canada.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**.

VIRUS. **Mosaic**, unidentified, NY.

WILT. **Verticillium dahliae**, OR.

ECLIPTA

BLIGHT. **Sclerotinia minor**, OK.

ENGELMANNIA (Engelmann Daisy)

BROOMRAPE. **Orobanche ramosa**, TX.

GALL, Leaf. **Synchytrium taraxaci**, TX.

ERIGERON (Fleabane)

BACTERIAL, MLO. **Aster Yellows**, KS, MD, MS, NJ, NY, OK.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

BROOMRAPE. **Orobanche ramosa**, TX.

DOWNY MILDEW. **Basidiophora entospora**, AL, IL; **Plasmopara halstedii**, IA, MD.

GALL, Leaf. **Synchytrium erigerontis**, LA.

LEAF SPOT. **Cercospora cana**, LA; **Cercospora colubrina**, WA; **Septoria erigerontis**, ME to MD, MI, NE.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CO, MI, MT, NM, PA, SD, WY; **Phyllactinia corylea**, WA; **Sphaerotheca macularis**, IN, KY.

ROT, Stem. **Sclerotium rolfsii**, IL.

RUST. **Puccinia cyperi** (0, I), MO; II, III on sedge; **P. dioicae** (0, I), East, South; **P. grindeliae** (III), CO, NV, UT, WY; **P. stipae** (0, I), CO, WY; **Coleosporium asterum** (II, III), CA, AK; 0, I on pine.



SMUT, White. **Entyloma compositarum**, MI, ND, UT, WA, WI, WY.

VIRUS. **Mosaic**, unidentified, IN.

WILT. **Verticillium albo-atrum**, MA.

#### ERIOPHYLLUM

NEMATODE. **Meloidogyne** sp., CA.

RUST. **Puccinia eriophylli** (II, III), WY, OR to CA; **Uromyces junci** (0, I), CA; II, III on *Juncus*.

ERYNGIUM (Rattlesnake Master)

LEAF SPOT. **Cylindrosporium eryngii**, IA, KS, TX, WI; **Septoria eryngicola**, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Macrophomina phaseoli**, OK.

SMUT, White. **Entyloma eryngii**, IA.

VIRUS. **Cucumber Mosaic**, OH.

ERYTHRONIUM (Dogs-Tooth Violet, Adders-Tongue, Trout-Lily)

BLIGHT. **Botrytis** sp., IL, NY, VT, WA; **B. elliptica**, WA; **Ciborinia gracilis**, IL, NE; **C. erythronii**, NY.

LEAF SPOT; Black Spot. **Asteroma tenerrimum** var. **erythronii**, ID, MT, WA.

RUST. **Uromyces heterodermus** (0, III), CA, CO, ID, MT, OR, TX, UT, WA, WY.

SMUT. **Ustilago heufleri**, DE, MD, MI, MO, NJ, NY, PA; **Urocystis erythronii**, CT, NY.

EUSTOMA (Prairie Gentian, Texas Bluebell)

BLIGHT, Stem. **Alternaria** sp., TX; **Sclerophoma eustomonis**, TX; **Phomopsis** sp., FL.

LEAF SPOT. **Cercospora eustomae**, CO, NE, TX; **C. nepheloides**, CA, TX; **Phyllosticta** sp., TX.

ROT, Crown. **Fusarium avenaceum**, CA; **Sclerotinia rolfsii**, FL.

VIRUS. **Cucumber Mosaic**, NY; **Impatiens Necrotic Spot**, FL; **Tomato Spotted Wilt**, PA; **Tomato Spotted Wilt – Impatiens Serotype**, FL, GA.

#### EVOLVULUS

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia lithospermi** (0, I, II, III), CO, KS, NE, TX.

VIRUS. **Tobacco Streak**, WI.

# F

FENUGREEK (*Trigonella*)

BACTERIAL, Leaf Spot. **Pseudomonas syringae** pv. **syringae**, NJ.

DOWNY MILDEW. **Peronospora trigonellae**, CA.

FERN, ADDERS-TONGUE (*Ophioglossum*)

BLIGHT, Leaf. **Curvularia crepini**, OH.

FERN, AQUATIC (*Salvinia* spp.)

LEAF SPOT, Water-Soaked Lesions. **Rhizoctonia solani**, FL.

FERN, OSMUNDA (*Osmunda*; Cinnamon, Interrupted, and Royal Ferns)

LEAF BLISTER. **Taphrinia higginsii**, GA.

LEAF SPOT. **Gloeosporium osmundae**, MI.

NEMATODE, Foliar. **Aphelenchoides fragariae**, SC.

RUST. **Uredinopsis osmundae** (II, III), northeastern and Great Lakes states, and to FL, and AL; 0, I on balsam fir.

SMUT, Inflorescence. **Mycosyrinx osmundae**, MI, NY, WI.

FERN, TREE (*Cibotium*)

LEAF SPOT. **Pestalotia cibotii**, NJ.

FERN, WALKING (*Camptosorus*)

LEAF SPOT. **Cercospora camptosori**, WI.

FIGWORT (*Scrophularia*)

DOWNY MILDEW. **Peronospora sordida**, CA, IL, NY, VA to KS.

LEAF SPOT. **Cylindrosporium scrophulariae**, IL, OK, PA; **Mycosphaerella** sp., KS; **Septoria scrophulariae**, CA, CO, OR, WA, NY to MS.

VIRUS. **Figwort Mosaic**.

FILAREE, RED-STEM (*Erodium cicutarium*)

NEMATODE, Lesion. **Pratylenchus minyus**, CA.

VIRUS. **Filaree Red Leaf**, CA.

FLORIDA PUSLEY (*Richardia scaba*)

VIRUS. **Tomato Spotted Wilt**, GA.

FOAM-FLOWER (*Tiarella*)

POWDERY MILDEW. **Sphaerotheca macularis**, AK.

RUST. **Puccinia heucherae** (III), CT to NC, AK, CA, CO, ID, MI, MT, OR, TN,  
WA, WI.

FRITILLARIA

LEAF SPOT. **Phyllosticta fritillariae**, CA.

RUST. **Uromyces miurae** (III), AK, WA.

VIRUS. **Mosaic**. Undetermined, NY.

FROELICHIA

LEAF SPOT. **Cercospora crassoides**, OK, TX, WI.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

WHITE RUST. **Albugo froelichiae**, NE, TX.

FROSTWORT (*Crocianthemum*)

LEAF SPOT. **Cylindrosporium eminens**, WI.

# G

## GALAX

LEAF SPOT. **Clypeolella leemingii**, black spot, MD to GA, MS; **Discohainesia oenotherae**, NC; **Phyllosticta galactis**, NC, VA, WV.

## GALIUM (Bedstraw)

DODDER. **Cuscuta cuspidata**, TX.

DOWNY MILDEW. **Peronospora calotheca**, IA, ND, WI.

LEAF SPOT. **Cercospora galii**, AL, AK, IA, NH, NY, OR; **Pseudopeziza repanda**, CA, CT, GA, IL, IA, NY, ND, OR, WI; **Melasmia galii**, IA; **Septoria cruciatae**, IN, MI, NJ, NY, WV, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, MT, OR, PA, WA; **Erysiphe polygoni**, KS.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia difformis** (0, I, III), OH to KS, MT, Pacific Coast; **P. punctata** (0, I, II, III); CT, MS, NC, ND to CA, WA; **P. punctata** var. **troglydytes** (0, I), CT to MO, SD, WA; **P. rubefaciens** (III), AK, IA, WI to CA, WA; **Pucciniastrum galii**, NY, PA to CA, CO, and OR; **Uromyces galii-californici** (II, III), CA.

## GENTIAN (*Gentiana*)

BLIGHT, Stem Canker. **Botrytis cinerea**, NY.

LEAF SPOT. **Asteromella andrewsii** (*Mycosphaerella andrewsii*), DE, IL, IA, NE, NJ, D, PA, WV, WI; **Cercospora gentianae**, NY, ND, VT; **C. gentianicola**, DE, WI.

ROT, Root. **Fusarium solani**, MD.

RUST. **Puccinia gentianae** (0, I, II, III), NY to IN, NE, MN; western states to AK, CA, WA; **P. haleniae**, WY; **Uromyces gentianae** (II, III), CO, IA, NV, NM, NC, VT, WA, WY; **Pucciniastrum alaskanum**, AK.

## GERANIUM (Cranesbill, Herb-Robert)

BACTERIAL Leaf Spot. **Pseudomonas erodii**, FL, IL, IN, OR, TX; **Xanthomonas geranii**, NY.

BLIGHT, Leaf Spot; Stem Rot. **Botrytis cinerea**, KS, MO.

BROOMRAPE. **Orobanche ramosa**, TX.

DOWNY MILDEW. **Plasmopara geranii**, NJ to FL, KS, TX, MA to IA, MT, UT, WI.

GALL, Leaf. **Synchytrium geranii**, LA, OK, TX.

LEAF SPOT. **Cercospora geranii**, CO, IA, KS, MO, MT, NY, TX, UT, WI;

**Cylindrosporium geranii**, LA; **Dilophospora geranii**, WI; **Pestalozziella subsessilis**, MS, MO, NJ, WI; **Phyllosticta geranii**, LA, TX; **Ramularia geranii**, CA, LA, WA, WY; **Septoria expansa**, KS, TX; **Stigmatea geranii**, black leaf speck, MD; **Venturia circinans**, mold, AK.

POWDERY MILDEW. **Erysiphe polygoni**, CO, IL, IN, OH, PA, WV, WI, WY;

**Sphaerotheca macularis**, CA, ID, MN, MT, NE, PA, WA, WI, WY.

ROT, Rhizome. **Seaverinia geranii**, NY, OH, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia leveillei** (III), CO, MT, UT, WA, WY; **P. polygoni-amphibii** (0, I),

CT to WI, KS, MN, MO, MT, TX; II, III on Polygonum; **Uromyces geranii** (0, I, II, III), AK, ME, WY.

VIRUS. **Cucumber Mosaic**, FL.

GILLENIA (American Ipecac, Indian Physic)

RUST. **Gymnosporangium exterum** (0, I), IN, KY, MO, NC, TN, VA, III on red-cedar.

GINGER, WILD (*Asarum*)

GALL, Leaf. **Synchytrium asari**, CA, MN, WI.

LEAF SPOT. **Ascochyta versicolor**, ID; **Plagiostoma (Laestadia) asarifolia**, SC.

ROT, Rhizome. **Sclerotinia sclerotiorum**, NY.

RUST. **Puccinia asarina**, CA, ID, OR, WA.

GLOBE-THISTLE (*Echinops*)

ROT, Crown. **Sclerotium rolfsii**, CT.

ROT, Root. **Phytophthora cryptogea**, NC.

GNAPHALIUM (Cudweed)

BACTERIAL, MLO. **California Aster Yellows**;

CANKER, Stem. **Phoma erysiphoides**, TX, WI.

DOWNY MILDEW. **Plasmopara halstedii**, AL, MS.

LEAF SPOT. **Cercospora gnaphaliacea**, KS, MS; **Cylindrosporium gnaphalicola**,

AL, TX; **Septoria cercosperma**, TX.

NEMATODE, Root Knot. **Meloidogyne** sp.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia gnaphaliicola** (II, III), AL, LA, NC, SC; 0, I unknown; **P. investita**

(0, I, III), AZ, CA, CT, MA, NY, OH, PA, TN, VT, WV, WI.

SMUT, White. **Entyloma compositarum**, AL, MD.

VIRUS. **Beet Curly Top**, CA; **Tomato Spotted Wilt**, GA.

GOLDEN-CLUB (*Orontium*)

BLIGHT, Leaf. **Botrytis streptothrix**, NJ.

LEAF SPOT. **Mycosphaerella** sp., NJ; **Phyllosticta orontii**, NJ, TX; **Ramularia**

**orontii**, NJ; **Volutella diaphana**, NJ.

GOLDEN-EYE (*Viguiera*)

POWDERY MILDEW. **Golovinomyces cichoracearum**, UT.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Helicobasidium purpureum**, TX.

RUST. **Puccinia abrupta** (II, III) AZ, TX; **P. tumidipes** (II, III), AZ, CA.

SMUT, White. **Entyloma compositarum**, UT.

GOLDENROD (*Solidago*)

BLACK KNOT. **Gibberidea heliopsisidis**, CT, MO, NY, ND.

BLIGHT, Thread. **Pellicularia koleroga**, LA.

CANKER, Stem. **Botryosphaeria ribis**, IA.

DODDER. **Cuscuta** spp., occasional.

DOWNY MILDEW. **Basidiophora entospora**, IL, WI; **Plasmopara halstedii**, IL, WI.

GALL, Leaf. **Rhodochytrium spilanthisidis**, LA.

LEAF SPOT. **Ascochyta compositarum**, WI; **Asteroma solidaginis**, black scurf; **Cercospora parvimaculans**, WI; **Colletotrichum solitarium**, KS, NE, WI; **Macrophoma sphaeropsispora**; **Phyllosticta solidagni-cola**, IL, WI; **Placosphaeria haydeni**, black spot; **Ramularia serotina**, CO, IL, TX, WI, WY; **Septoria** spp.

MOLD, Leaf. **Cladosporium astericola**, WI.

NEMATODE, Lesion. **Pratylenchus pratensis**, FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general; **Phyllactinia corylea**, WA; **Sphaerotheca macularis**, IN; **Uncinula** sp., NY.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium delicatulum** (II, III), ME to VA, KS; 0, I on pine; **C. asterum** (II, III), general; 0, I on 2- and 3-needle pines; **Puccinia dioicae** (0, I), general; II, III on *Carex*; **Puccinia virgae-aureae** (III), IL, NH, MA, MI, NY; **P. grindeliae** (III), IL, WI to CA, WA; **P. stipae** (0, I), CO, MT, NE, NM, ND; II, III on *Stipa*; **Uromyces perigynius** (0, I), ME; II, III on *Carex*; **U. solidaginis** (III), CO, ID.

SMUT, Inflorescence. **Thecaphora cuneata**, KS.

SPOT ANTHRACNOSE. **Elsinoë solidaginis**, FL, GA, SC.

VIRUS. **Mosaic**. Unidentified, NY; **Tomato Spotted Wilt**, PA.

GOLDENSEAL (*Hydrastis*)

BLIGHT, Leaf. **Alternaria** sp., MI, NY, OH; **Botrytis** sp., CT to NC, IN, WA, WI.

NEMATODE, Root Knot. **Meloidogyne** spp., OH, MI, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, NC.

ROT, Stem. **Phytophthora cactorum**, NC.

VIRUS. **Mosaic**. Unidentified, CT.

WILT. **Fusarium** sp., IL, NY, OH, WA.

GOLDTHREAD (*Coptis*)

LEAF SPOT. **Mycosphaerella coptis**, ME, NY, VT; **Septoria coptidis**, ID, MI, NY, VT, WI, WA; **Phyllosticta helleboricola** var. **coptidis**, AK; **Vermicularia coptina**, NY.

GOPHER PLANT or CAPER SPURGE (*Euphorbia*)

ROT, Root. **Macrophomina phaseolina**, AZ; **Pythium aphanidermatum**, AZ;  
**Rhizoctonia solani**, AZ.

## GOUANIA

RUST. **Puccinia invaginata** (II, III), FL.

GOURD (*Lagenaria*, *Luffa*, *Trichosanthes*)

ANTHRACNOSE. **Colletotrichum lagenarium**, CT, IL, IN, IA, MD, MN, NE, PA.

BACTERIAL, Angular Leaf Spot. **Pseudomonas lachrymans**, WI.

BLIGHT, Southern. **Sclerotium rolfsii**, SC.

BLIGHT, Thread. **Pellicularia koleroga**, FL.

DOWNY MILDEW. **Pseudoperonospora cubensis**, CT, FL, MA, NC, OH.

FRUIT SPOT. **Macrophoma trichosanthis**, AL; **Phoma subvelata**, TX; **Stemphylium**  
 sp., NY.

LEAF SPOT. **Cercospora cucurbitae**, AL, IN.

NEMATODE, Root Knot. **Meloidogyne** sp., AL, FL, OH.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CT, WI.

ROT, Fruit. **Mycosphaerella citrullina** (*Laestadia cucurbitacearum*), PA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Cucumber Mosaic**, IN, NY; **Tobacco Ring Spot**, TX, on *Luffa acutangula*;  
**Zucchini Yellow Mosaic**, **Papaya Ringspot – Type W**, Brazil.

GRAPE (*Vitis*)

ANTHRACNOSE. **Elsinoë ampelina**, MI.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, widespread.

BACTERIAL Leaf Spot. **Xanthomonas** sp., NY.

BACTERIAL, Melting, Decay. **Bacillus subtilis**, CA; **Cryptococcus laurentii**, CA.

BACTERIAL, Xylem-limited. **Pierce's Disease**, NC.

BLACK FOOT. **Cylindrocarpon liriodendra**, CA.

BLACK GOO. **Phaeoacremonium chlamydosporum**, CA.

BLACK LEG. **Cylindrocarpon obtusisporum**, CA.

BLIGHT, Shoot. **Sclerotinia sclerotiorum**, CA.

BLOTCH, Leaf. **Briosia amphelophaga**, TX.

CANKER. **Lasiodiplodia crassispora**, CA; **Diplodia corticola**, CA.

CANKER, Bot. **Lasiodiplodia theobromae**, **Diplodia seriata**, CA, Mexico.

CANKER; Deadarm; Branch Necrosis. **Cryptosporella** (*Phomopsis*) **viticola**, wide-  
 spread; **Aspergillus niger**, CA.

CANKER; Dieback. **Botryosphaeria rhodina** and **B. obtusa**, Baja, Mexico.

CANKER, Wedge-shaped. **Botryosphaeria** sp., CA.

DECLINE. **Phaeoacremonium aleophilum**; **P. chlamydosporum**, NY, PA; **P. inflatipes**,  
 CA; **Botryosphaeria liberica**, **B. viticola**, CA.

DIEBACK. **Eutypa armeniacae**, CA, NY; **E. lata**, CA, MI; **Eutypella vitis**, MI.

DIPLODIA CANE DIEBACK. **Lasiodiplodia theobromae**, Bolivia.

DOWNY MILDEW. **Plasmopara viticola**, general, serious in East.

FRUIT SPOT; Flyspeck. **Leptothyrium pomi**, PA, WV.

- LEAF SPOT. **Mycosphaerella personata** (*Isariopsis clavispora*) wide-spread  
**Phomopsis viticola**, NY; **Septoria ampelina**, NY, TX, VA; **Septosporium heterosporum**, CA.
- LEAF SPOT, Zonate. **Cristulariella pyramidalis**, WV; **C. moricola**, GA.
- MEASLES. **Togninia fraxinopennsylvanica** Anamorph, **Phaeoacremonium viticola**, CA.
- NEMATODE. **Meloidoderita** sp., NY.
- NEMATODE, Citrus. **Tylenchulus semipenetrans**, CA.
- NEMATODE, Cyst. **Heterodera punctata**, MI.
- NEMATODE, Dagger. **Xiphinema index**.
- NEMATODE, Lesion. **Pratylenchus pratensis**, CA; **P. minyus**, CA; **P. coffeae**, CA; **P. vulnus**, CA.
- NEMATODE, Pin. **Paratylenchus hamatus**.
- NEMATODE, Ring. **Criconemoides xenoplax**, CA.
- NEMATODE, Root Knot. **Meloidogyne** spp.
- NEMATODE, Spiral. **Helicotylenchus pseudorobustus**, CA.
- NEMATODE, Stubby Root. **Paratrachodorus christiei**.
- NONPARASITIC. **Little Leaf**. Zinc deficiency, CA. **Shot Berry**. Defective pollination. **Skin Blanching**. Sulfur dioxide injury.
- PHYTOPLASMA, Aster Yellows. **Candidatus Phytoplasma asteris**, British Columbia, Ontario, Quebec, Canada.
- PHYTOPLASMA, Bois Noir. British Columbia, Canada.
- PIERCE'S DISEASE. **Xyella fastidiosa**, OK.
- POWDERY MILDEW. **Uncinula necator**, general, MA.
- ROT, Bitter. **Greeneria uvicola**, MS; **Melanconium fuligineum**, wide-spread, often secondary after black rot.
- ROT, Black. **Guignardia bidwellii**, general.
- ROT, Charcoal. **Macrophomina phaseoli**, TX.
- ROT, Fruit. **Alternaria** sp., CA; **Aspergillus niger**, black mold, CA, OR; **Botrytis cinerea**, gray mold, CA; **Cladosporium** sp., green mold; **Penicillium** spp., blue mold, cosmopolitan; **Glomerella cingulata**; **Colletotrichum acutatum**; **C. gloeosporioides**, ripe rot; **Pestalotia** sp., **Phoma** spp.; **Botryosphaeria dothidea**, **Macrophoma** rot, MS; **Monilinia fructicola**, brown rot, British Columbia, Canada.
- ROT, Root. **Armillaria mellea**, AR, CA, MO, TX, WA; **Phymatotrichum omnivorum**, TX; **Clitocybe tabescens**, SC to TX, OK; **Roesleria hypogaea**, NY to VA, IA, MO; **R. subterranean**, MI, Midwest U.S.; **Rosellinia necatrix**, AL, IN, MI, NY, OH.
- ROT, Sour. **Hanseniaspora uvarum**, Ontario Canada; **Gluconobacter cerinus**, Ontario, Canada; **Aspergillus carbonarius**, CA.
- ROT, Summer Bunch. **Diplodia viticola** (*D. natalensis*).
- ROT, White; Dieback. **Coniothyrium diplodiella**, MA to FL, TX.
- ROT, Wood. **Schizophyllum commune**, VA; **Stereum** spp.; **Poria** spp.; **Polyporus** spp.; **Pleurotus ostreatus**, CA.
- RUST. **Physopella ampelopsidis** (*P. vitis*) (II), FL, SC.



SCORCH, Leaf. **Pseudopezicula tetraspora**, NY, PA.

SPOT ANTHRACNOSE; Bird's Eye Rot. **Elsinoë ampelina**, widespread.

TRUNK DISEASE. **Neofusicoccum parvum**, **Cryptovalsa ampelina** and **Eutypella leprosa**, Chile.

VASCULAR; FOLIAR DISEASE. **Phaeoacremonium**, CA.

VIRUS. **Alfalfa Dwarf**; **Grape Fanleaf**, WA, Pacific Northwest; **Grape Leafroll** (White Emper or Disease), CA, ID, WA, Chile; **Grape Yellow Mosaic**; **Virus Complex** (Kober Stem Grooving), CA; **Tobacco Ring Spot**, MI, NY; **Tomato Ring Spot**, NY; **Grapevine Fleck**, WA; **Grapevine Stem Pitting** Associated, CA; **Peach Rosette Mosaic**; **Tomato Spotted Wilt**; **Grapevine Rupestris Vein Feathering**, CA; **Grapevine Syrah**, CA, WA, Chile.

Black rot is the most destructive grape disease in most sections of the country, often causing total loss of fruit in home gardens. Pierce's disease has destroyed many vineyards in California, the pathogen is transmitted by grafting and by leafhoppers.

GRINDELIA (Gumweed)

LEAF SPOT. **Cercospora grindeliae**, CA, TX, WI; **Septoria grindeliae**, CO, KS, TX; **S. grindeliicola**, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, MN to NM, CA, MT.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium asterum** (II, III), CA, CO, WA, WI; 0, I on pine; **Puccinia dioicae** (0, I), KS, NE, TX; II, III on *Carex*; **P. grindeliae** (III), NE to TX, CA, MT; **P. stipae** (0, I), CO, KS, NE, ND, SD; II, III on *Stipa* and other grasses; **Uromyces junci** (0, I); II, III on *Juncus*.

SMUT, Inflorescence. **Thecaphora californica**, CA, UT; **T. cuneata**, CO, KS, NE, NM.

GROUND-CHERRY, PURPLE-FLOWERED (*Quincula*)

LEAF SPOT. **Cercospora physalidis**, KS.

RUST. **Puccinia aristidae** (0, I), CO.

GROUND-IVY (*Gleoma*)

RUST. **Puccinia glechomatis**, IN, NY.

GROUND-SMOKE (*Gayophytum*)

LEAF SPOT. **Cercospora gayophyti**, CA.

RUST. **Puccinia vagans** (0, I, II, III), ND to NM, CA, WA.

SMUT, Seed. **Ustilago gayophyti**, CA, NV, OR, UT.

GUAR (*Cyamopsis*)

BACTERIAL BLIGHT. **Xanthomonas campestris** pv. **cyamopsidis**, AZ.

POWDERY MILDEW. **Leveillula taurica**, AZ.

VIRUS. **Guar Symptomless**.

# H

HARBINGER-OF-SPRING (*Erigenia*)

RUST. **Puccinia erigeniae** (0, I, III), OH.

HAWKBIT, FALL DANDELION (*Leontodon*)

BACTERIAL, MLO. **Aster Yellows**, ME, NY.

RUST, **Puccinia hieracii** (0, I, II, III), ME, NH.

HAWKSBEARD (*Crepis*)

LEAF SPOT. **Cercospora stromatis**, CO; **Phyllosticta eximia**, CO; **Ramularia crepidis**, NM.

POWDERY MILDEW. **Golovinomyces cichoracearum**, NE, PA; **Sphaerotheca macularis**, WY.

RUST. **Puccinia crepidis-montanae** (0, I, II, III), CO, ID, MT, OR, UT, WA, WY; **P. hieracii**, ND to CO, WA; II, III on *Carex*.

HAWKWEED (*Hieracium*)

BLIGHT, Stem. **Phoma hieracii**, TX.

DOWNY MILDEW. **Bremia lactucae**, WI.

LEAF SPOT. **Cercospora hieracii**, AL, NC; **Phyllosticta decidua**, WI; **Septoria cercosperma**, TX; **S. hieracicola**, NY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA, TX; **Sphaerotheca macularis**, IL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia dioicae** (0, I), PA to IL, CA, MT, OR, WI; II, III on *Carex*; **P. fraseri** (III), MT, NE, NY, NH, PA, TN, VA, WV; **P. hieracii** (0, I, II, III), ME to VA, CA, CO FL, IL, TX, WA; **P. columbiensis**, OR, TX, WA; **Aecidium columbiense** (0, I), CA, ID, OR, WA.

HEDGE PARSLEY (*Torilis*)

GALL, Leaf. **Protomyces macrosporus**, AR.

HELENIUM (Sneezeweed)

BACTERIAL, MLO. **Aster Yellows**, NY, and **California Aster Yellows**, CA.

LEAF SPOT. **Cercospora helenii**, AL, TX; **Septoria helenii**, IA, PA, TX.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, CO, OR, TX, UT, WA,  
 WI, WY.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia conspicua** (0, I), AZ, CO, NM; II, III on *Koeleria*, **P. dioicae** (0, I),  
 CO, NE, TX; II, III on *Carex*.  
 SMUT. **Entyloma compositarum**, TX, WI; **E. polysporum**, MT.  
 VIRUS. **Helenium S. Carlavirus**.

#### HELIOPSIS

BACTERIAL, Proliferation. **Rhodococcus fascians**, OR.  
 BLACK KNOT. **Gibberidea heliopsidis**.  
 LEAF SPOT. **Phyllosticta pitcheriana**, NY; **Septoria helianthi**, IN; **S. heliopsidis**,  
 WI.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, IA, MN, NE, NM, ND, WI;  
**Leveillula taurica**, IA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Coleosporium helianthi** (II, III), NC; 0, I on pine; **Puccinia batesiana**  
 (0, I, III), DE, IA, KS, MD, MN, NE, PA, WI; **P. helianthi** (0, I, II, III), IN, MN,  
 NC, PA, VA.  
 VIRUS. **Mosaic**. Unidentified, IA.

#### HEMP (*Cannabis*)

BLIGHT, Gray Mold. **Botrytis cinerea**, OR, VA.  
 BLIGHT, Southern. **Sclerotium rolfsii**, SC, TX.  
 BROOMRAPE. **Orobanche ramosa**, CA, IL, KY, WI.  
 CANKER. **Sclerotinia sclerotiorum**, Canada.  
 CANKER; Stem Rot. **Gibberella quinqueseptata**; **G. saubinetti**, IN, VA.  
 CANKER; Stem Wilt. **Botryosphaeria marconii**, MD, VA.  
 LEAF CURL, Wilt. **Cercospora cannabina**, MS.  
 LEAF SPOT. **Cylindrosporium** spp., MD; **Septoria cannabis**, MD to KY, FL, IA,  
 MN, TX; **Cercospora cannabis**, MS.  
 NEMATODE, Root Knot. **Meloidogyne** sp., TN.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, FL.  
 ROT, Charcoal. **Macrophomina phaseoli**, IL.  
 ROT, Root. **Phymatotrichum omnivorum**, TX; **Hypomyces cancri**, MD.  
 ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, MT.

#### HEMPSESBANIA (*Sesbania*)

CANKER, STEM. **Diaporthe phaseolorum** var. **caulivora**, LA.

#### HENBIT (*Laminum*)

ROT. **Sclerotinia minor**, NC.  
 VIRUS. **Tomato Ringspot**, PA.

#### HEPATICACA

DOWNY MILDEW. **Plasmopara pygmaea**, IA, IL, NY, PA, WI.

LEAF SPOT. **Discosia artocreas**, secondary, IA; **Septoria hepaticae**, MI, NC.  
 RUST. **Tranzschelia pruni-spinosae** (0, I), MA to MD, TN, MN; II, III on wild plum.  
 SMUT, Leaf and Stem. **Urocystis anemones**, NY to IN, MO, MN, WI.

HERACLEUM (*Cow-Parsnip*)

LEAF SPOT. **Cylindrosporium heraclei**, CA, CO, ID, MT, ND, TX, UT, WA, WY;  
**Fusicladium angelicae**, WI; **Phyllosticta heraclei**, AK, OR, TX; **Ramularia heraclei**, general.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.

HERONSBILL (*Erodium*)

BACTERIAL, MLO. **California Aster Yellows**.  
 BLIGHT, Southern. **Sclerotium rolfsii**, TX.  
 DOWNY MILDEW. **Pseudoperonospora erodii**, MT, TX.  
 GALL, Leaf. **Synchytrium papillatum**, AZ, CA, OR, TX.  
 ROT, Root. **Rhizoctonia solani**, TX.  
 VIRUS. **Beet Curly Top**, CA; **Filaree Red Leaf**, CA.

HOARHOUND (*Marrubium*)

GALL, Leaf. **Synchytrium marrubii**, TX.  
 LEAF SPOT. **Cercospora marrubii**, OK, TX.  
 NEMATODE, Root Knot. **Meloidogyne** sp., AL.

HOARY-TICK CLOVER (*Desmodium*)

ROT, BLACK. **Cylindrocladium parasiticum**, FL.  
 VIRUS. **Cowpea Mosaic**, IL; **Desmodium Mosaic**, FL; **Desmodium Yellow Mottle**, AR.

HOMALOMENA

LEAF SPOT. **Glomerella cincta**, NJ.

HONESTY (*Lunaria*)

CLUB ROOT. **Plasmodiophora brassicae**, NJ.  
 LEAF SPOT. **Alternaria oleracea**, black spot of leaves, pods; **Helminthosporium lunariae**, MA.  
 ROT, Root; Damping-off. **Aphanomyces raphani**, WI.

HORSE-GENTIAN (*Triosteum*)

LEAF SPOT. **Cladosporium triostei**, IL, IA, MO, NE, WV, WI; **Cylindrosporium triostei**, IL, KS, OK, WI; **Cercospora triostei**, WI.  
 POWDERY MILDEW. **Phyllactinia corylea**, MI.  
 RUST. **Aecidium triostei** (0, I), MO.

HORSE PURSLANE (*Trianthema*)

LEAF SPOT. **Gibbago trianthemae**, AR.

HORSEWEED (*Conyza*)

ROT. **Sclerotinia minor**, NC.  
 VIRUS. **Tomato Spotted Wilt**, GA.

HOUSTONIA (*Bluets*)

DOWNY MILDEW. **Peronospora calotheca**, IL; **P. seymourii**, AL, AR, IL, IA, MS, TX.

LEAF SPOT. **Cercospora houstoniae**, DE; **Septoria** sp., TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia lateritia**, TX; **Uromyces houstoniatus** (0, I), MA to MS, IL, MO, WI; II, III on blue-eyed grass; **U. peckianus** (0, I), AL, MS, TX; II, III on grasses.

## HYDRILLA (Aquatic)

DYING SHOOTS. **Plectosporium tabacinum**, FL, Bioassay indicated that **Botrytis** sp., **Cephalosporium** sp., **Curvularia** sp., **Fusarium culmorum**, **F. moniliforme**, and **Phytophthora** sp. were pathogenic to hydrilla. Notes: Hydrilla is a submerged aquatic weed. It is an exotic, invasive species that is a threat to fresh water sources in the USA.

HYDROPHYLLUM (*Waterleaf*)

DOWNY MILDEW. **Peronospora hydrophylli**, IL, IA, MD, NY, WA, WI.

LEAF SPOT. **Ascochyta hydrophylli**, WA; **Gloeosporium hydrophylli**, NH; **Ramularia hydrophylli**, WA; **Septocylindrium hydrophylli**, NY; **Septoria hydrophylli**, NY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, occasional; **Erysiphe polygoni**, ID, WA; **Sphaerotheca macularis**, ND, OH, SD.

ROT, Leaf and Stem. **Ceratobasidium anceps**, NY, WI.

RUST. **Puccinia hydrophylli** (III), CA, CO, NY to NE, ND, UT; **P. recondita** (0, I), MT, widespread; II, III on grasses.

## HYMENOPAPPUS

DOWNY MILDEW. **Plasmopara halstedii**, OK.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia grindeliae** (0, III), OK.

# I

INDIAN CUCUMBER-ROOT (*Medeola*)

GALL, Stem Hypertrophy. **Medeolaria farlowii**, ME, MA, NJ.

LEAF SPOT. **Phyllosticta medeolae**, NY.

INULA (*Elecampane*)

LEAF SPOT. **Ramularia** sp., MI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, NJ, NY, WI, probably general.

RUST. **Puccinia hieracii**, WI.

Inula is very susceptible to powdery mildew, which coats the foliage white in late summer.

ITALIAN DANDELION (*Cichorium intybus*)

BACTERIAL, Leaf Spot. **Pseudomonas syringae**.

ITCHGRASS (*Rottobellia*)

BLIGHT. **Curvularia cymbopogonis**, LA.

ROT, Root. **Pythium arrhenomanes**, LA.

IVESIA

RUST. **Phragmidium horkeliae** (III), UT; **P. ivesia**, CA; **P. jonesii**, NV, OR, UT.

IXORA

NEMATODE, Burrowing. **Radopholus similis**, FL.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

ROT, Root. **Clitocybe tabescens**, FL.

# J

JACK-IN-THE-PULPIT (*Arisaema*)

BLIGHT, Leaf and Stalk. **Streptotinia arisaemae** (*Botrytis streptothrix*), IL, IA, MD, NY, PA, WI.

LEAF SPOT. **Cladosporium** sp., mold, VA; **Volutella** sp., IN.

RUST. **Uromyces ari-triphylli** (0, I, II, III), NY to FL and TX; Pacific Northwest.

JIPIJAPA (*Carludovia palmata*)

PHYTOPLASMA. **Leaf Yellows**, southern Mexico.

# K

KNIPHOFIA (Tritoma, Torch-Lily, Poker-Plant)

LEAF SPOT. **Alternaria** sp., AL.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

KOCHIA (Summer-Cypress)

DAMPING-OFF; Root Rot. **Pythium debaryanum**; SD; **Rhizoctonia solani**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia aristidae** (0, I), CO, NE, TX.

VIRUS. **Beet Curly Top**, CA.

KOHLERIA

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

KRIGIA (Dwarf Dandelion)

DOWNY MILDEW. **Bremia lactucae**, MS, MO, OKWI.

LEAF SPOT. **Mycosphaerella krigiae**, IL, WI; **Septoria krigiae**, KY, NY, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia dioicae** (0, I), IL, IA, WI; II, III on *Carex*; **P. hieracii** (0, I, II, III), NC; **P. maculosa** (III), IL, MI, MS, MO, PA, TN.

KUHNIA (False-Boneset)

LEAF SPOT. **Pleospora compositarum**, NM, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia kuhniae** (0, I, II, III), IN to AL, FL, MT, NE, ND, TX.



# L

LAMIUM (Perennial Groundcover)

NEMATODE, Leaf. **Aphelenchoides fragariae**, CT.

LAPPULA (Hackelia)

DOWNY MILDEW. **Peronospora echinospermi**, IA, TX; **P. myosotidis**, MT.

LEAF SPOT. **Cercospora cynoglossi**, WI; **Ovularia asperifolii** var. **lappulae**, WI;  
**Phyllosticta decidua**, WI, TX.

POWDERY MILDEW. **Golovinomyces cichoracearum**, IA, MI, MN, MO, OH, TX,  
WI; **Microsphaera** sp., IL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia mertensiae** (III), TX, UT.

SMUT, Leaf. **Entyloma serotinum**, UT.

LAVATERA (Treemallow)

ANTHRACNOSE, Leaf Spot. **Colletotrichum malvarum**, CA, TX.

DAMPING-OFF. **Rhizoctonia solani**, IL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia malvacearum** (III), CA.

VIRUS. **Abutilon Infectious Variegation**.

LAYIA (Tidy-Tips)

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA.

VIRUS. **Tomato Spotted Wilt**, CA.

LEUCOJUM (Snowflake)

LEAF SCORCH, Red Blotch. **Stagonospora curtisii**, CA.

NEMATODE, Meadow. **Pratylenchus** sp.

ROT; Scale Speck, of Bulbs. **Botrytis** sp., CA.

LEWISIA (Bitterroot)

RUST. **Uromyces unitus** (I, III), CA, MT, WA.

LIATRIS (Gayfeather)

DODDER. **Cuscuta glomerata**, OK.

LEAF SPOT. **Phyllosticta liatridis**, WI; **Septoria liatridis**, MN, ND, TX, WI.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, OK.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 ROT, Stem. **Sclerotinia sclerotiorum**, NY.  
 RUST. **Coleosporium laciniariae** (II, III), NJ to FL, AR, TX; 0, I on pines; **Puccinia liatridis** (0, I), IN, KS, MT, NE, ND, WI to CO; II, III on grasses.  
 WILT. **Verticillium albo-atrum**, NJ.

LILY-OF-THE-VALLEY (*Convallaria*)

BLIGHT, Gray Mold; Rhizome Rot. **Botrytis paeoniae**, IL, ME, PA.  
 BLIGHT, Southern. **Sclerotium rolf sii**, ME.  
 LEAF BLOTCH. **Ascochyta majalis** (*Mycosphaerella convallaris*), PA.  
 LEAF SPOT. **Gloeosporium convallariae**, NY; **Kabatiella microsticta**, secondary, MD; **Phyllosticta** sp., NJ, NY; **Phytophthora citricola** (also foliar blight), CA.  
 NEMATODE, Meadow. **Pratylenchus pratensis**, associated with forcing failures.  
 NEMATODE, Root Knot. **Meloidogyne** sp., occasional.

LINARIA (Blue Toadflax; Butter and Eggs)

ANTHRACNOSE. **Colletotrichum vermicularioides**, MA, NJ, NY, TX, WI.  
 BACTERIAL, MLO. **Aster Yellows**, CA.  
 BLIGHT, Gray Mold. **Botrytis cinerea**, AK.  
 BLIGHT, Southern. **Sclerotium rolf sii**, TX.  
 DOWNY MILDEW. **Peronospora linariae**, FL, MA, OK, WI.  
 LEAF SPOT. **Alternaria** sp., MI; **Septoria linariae**, WI.  
 NEMATODE, Root Knot. **Meloidogyne** spp.  
 NEMATODE, Stem and Leaf. **Ditylenchus dipsaci**, NY.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, CA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, IL; **Thielaviopsis basicola**, CT.  
 ROT, Stem. **Sclerotinia sclerotiorum**, AZ.  
 RUST. **Puccinia antirrhini** (II, III), CA; **Aecidium** sp., WI.  
 SMUT, White. **Entyloma linariae**, CT, NJ, PA.

LINNAEA (Twin-Flower)

BLACK MILDEW. **Halbaniella linnaeae**, NY.  
 LEAF SPOT. **Phyllachora wittrockii**, tar spot, MI, MT, NM, NY; **Venturia dickei**, ID, MI, MT, NM, NY, OR, WA, WI; **Septoria breviscula**, NY.

LIPPIA (Fog-Fruit, Lemon-Verbena)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, AZ.  
 BLACK MILDEW. **Meliola lippiae**, AZ, FL.  
 BLIGHT, Southern. **Sclerotium rolf sii**, AZ, CA.  
 LEAF SPOT. **Cercospora lippiae**, widespread; **Cylindrosporium lippiae**, TX.  
 NEMATODE, Root Knot. **Meloidogyne** sp., AZ.  
 SPOT ANTHRACNOSE. **Sphaceloma lippiae**, IN, FL.

LISIANTHUS (*Eustoma grandiflora*)

ROT, Root. **Pythium irregulare**, CA.

VIRUS, Yellow and Necrotic Leaf Spots. **Moroccan Pepper Virus**, Iran.

## LITHOPHRAGMA (Woodland-Star)

RUST. **Puccinia heucherae** (III), CA, UT, WA.

SMUT, Leaf and Stem. **Urocystis lithophragmae**, UT.

## LITHOSPERMUM (Gromwell, Puccoon)

LEAF SPOT. **Septoria lithospermi**, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA, TX.

RUST. **Aecidium hesleri**, TN; **Puccinia recondita** (0, I), NE, ND, SD, TX.

## LOMATIUM (Biscuit-Root)

DOWNY MILDEW. **Plasmopara nivea**, MT.

LEAF SPOT. **Phyllachora** sp., WA.

RUST. **Puccinia asperior** (0, I, III), CA, OR, WA; **P. jonesii** (0, I, III), KS, NE, UT, WA; **P. ligustici**, ID, WA.

LOOSESTRIFE, FRINGED (*Steironema*)

LEAF SPOT. **Cylindrosporium steironematis**, NY; **Mycosphaerella** sp., NY; **Phyllosticta lysimachiae**, NY; **Ramularia lysimachiae**, NC, WI; **Septoria conspicua**, ME to MS, CO, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia dayi**, NY to WV, IL, MI, MT, WI; **P. distichlidis** (0, I), CO, ND; II, III on marsh grass; **Uromyces acuminatus** (0, I), CT to CO, ND, SD.

LOOSESTRIFE, MONEYWORT (*Lysimachia*)

BLIGHT, Leaf and Stem Necrosis. **Ceratobasidium anceps**, WI.

GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Cercospora lysimachiae**, NJ; **Cladosporium lysimachiae**, MA; **Ramularia lysimachiae**, WI; **Septoria conspicua**, IA, NY, VT.

NEMATODE, Root Knot. **Meloidogyne** sp., TX.

NEMATODE, Stem. **Ditylenchus dipsaci**.

ROT, Crown Stem. **Sclerotium rolfsii**, KS; **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium campanulae** (II, III), TN; 0, I on red pine; **Puccinia limosae** (0, I), MA to NC, MI, NE, WI.

LOTUS (*Nelumbo*)

BLIGHT. **Dothiorella nelumbonis**, on flower parts, DE, MD.

LEAF SPOT. **Alternaria nelumbii**, MD, NJ, NY, OK, PA, TX; **Cercospora nelumbonis**, IN, TX.

## LUDWIGIA (False Loosestrife)

LEAF SPOT. **Cercospora ludwigiae**, AL; **Pezizella oenotherae**, VA; **Phyllosticta ludwigiae**, NY, WI; **Septoria ludwigiae**, MD, MS, PA.

RUST. **Puccinia jussiaeae** (0, I, III), DE to FL, CA, LA, MS, OH, TX, WI.

LYTHRUM (Winged, Purple Loosestrife)

GALL, Leaf. **Synchytrium lythrii**, LA.

LEAF SPOT. **Cercospora lythri**, WI; **C. lythracearum**, MS; **Pezizella oenotherae**, MI, NY; **Septoria lythrina**, KS, NY, WI.

ROT, Root. **Rhizoctonia solani**, IL.

# M

## MAIANTHEMUM

BLIGHT. **Botrytis** sp., NY.

LEAF SPOT. **Ramularia rubicunda**, MI, NY, OH, PA, WI, CA to AK; **Sphaeropsis cruenta**, AK, WA.

RUST. **Puccinia sessilis** (0, I), MA, MI, MN, NY, PA, WI; II, III on *Phalaris*;  
**Uromyces acuminatus** var. **magnatus** (0, I), MI, NY, WI; II, III on marsh grass.

## MALACHRA

LEAF SPOT. **Cercospora malachrae**, TX.

## MALACOTHRIX

GALL, Leaf. **Synchytrium innominatum**, CA.

RUST. **Puccinia harknessii** (III), CA; **P. hieracii** (0, I, II, III), CA.

## MALLOW, GARDEN (*Malva*)

BACTERIAL, MLO. **California Aster Yellows**, CA; **Beet Curly Top**, CA.

LEAF SPOT. **Alternaria** sp.

ROT, Root. **Macrophomina phaseoli**, CA on *Malva parviflora*; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia heterospora** (III), KS, TX; **P. malvacearum**, CA, CO, OR, WV.

VIRUS. **Malva Vein Clearing**, CA.

## MALVASTRUM (False-Mallow, Bush-Mallow)

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia interveniens** (0, I), CA; III on *Stipa*; **P. malvacearum**; **P. schedonardi** (0, I), MT, ND to NM; II, III on wild grasses; **P. sherardiana** (0, III), MT, ND to TX, NM; **P. heterospora** (III), TX.

VIRUS. **Begomoviruses** (especially in Malvaceous weed species), Yucatan Peninsula.

## MANFREDA (Spice-Lily, Wild Tuberose)

LEAF SPOT. **Cercospora amaryllidis**, TX; **Phyllosticta hymenocallidis**, TX.

RUST. **Aecidium modestum**, TX.

## MARAH

VIRUS. **Wild Cucumber Mosaic**, CA, OR.

MARIGOLD (*Tagetes*)

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **tagetis**, NC.

BACTERIAL, MLO. **Aster Yellows**, CT, NJ, NY, PA, WI; **California Aster Yellows**, CA.

BACTERIAL Wilt. **Pseudomonas solanacearum**, FL.

BLIGHT. **Alternaria tagetica**, SC.

BLIGHT, Head. **Botrytis cinerea**, AK, CT, NJ, PA; **Helminthosporium** sp., TX.

BLIGHT, Southern. **Sclerotium rolfsii**, FL, NJ, VA.

LEAF SPOT. **Alternaria tagetica**, SC, NJ; **Cercospora** sp., CT, **C. tageticola**, FL; **Septoria tageticola**, FL.

NEMATODE. **Aphelenchoides tagetae**, MD; **Paratylenchus micoletzkyi**, MD.

NEMATODE, Root Knot. **Meloidogyne hapla**, VA.

NONPARASITIC. **Air Pollution**. NO<sub>2</sub>, SO<sub>3</sub>, O<sub>3</sub>, NC.

ROT, Charcoal. **Macrophomina phaseoli**, OK.

ROT, Root. **Pythium ultimum**, CA; **Rhizoctonia solani**, TX.

ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, NY; **Phytophthora cryptogea**, NY; **Fusarium** sp., CA, NJ, NY.

RUST. **Coleosporium madae** (II, III), CA; 0, I on pine; **Puccinia tageticola** (II, III), TX.

VIRUS. **Cucumber Mosaic**, FL.

WILT. **Fusarium oxysporum** f. sp. **callistephi**, CA; **Verticillium alboatrum**, NY; **V. dahliae**, AZ.

Marigolds are easy to grow without paying too much attention to disease. Cut fading flower heads off into a paper bag before the gray mold of *Botrytis* blight gets started.

MARSHELDER (*Iva xanthifolia*)

DOWNY MILDEW. **Plasmopara halstedii**, ND.

MARSH-MARIGOLD (*Caltha*)

GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Cercospora calthae**, WI; **Cylindrosporium** sp., NY; **Fabraea rousseauana**, CA, WI; **Ramularia calthae**, NY, WI.

POWDERY MILDEW. **Erysiphe polygoni**, MI, OH, WI.

RUST. **Puccinia areolata** (0, I, II, III), AK, CA, CO, WA; **P. calthae** (0, I, II, III), NY, NJ to IA, ND; **P. calthicola** (0, I, II, III), NY to IA, MN; **P. gemella** (III), AK, CA, ID, MT, OR, WA; **P. treleasiana** (III), CO, NV, UT, WA, WY.

## MATELEA

PARASITIC LICHEN. **Strigula elegans**; **S. complanata**, Southern U.S., LA.

## MATRICARIA (False Chamomile)

BACTERIAL, MLO. **California Aster Yellows**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, WA; **Sphaerotheca macularis**, WA.

WHITE RUST. **Albugo tragopogonis**, CA, ND, OR.

## MAURANDYA

LEAF SPOT. **Septoria antirrhinorum**, TX.

MAURITIUS-HEMP (*Furcraea*)

NEMATODE, Root Knot. **Meloidogyne** sp., MD.

MAY-APPLE (*Podophyllum*)

BLIGHT, Gray Mold. **Botrytis cinerea**, NJ.

BLIGHT, Leaf. **Septotinia podophyllina**, DE, MD, MO, NJ, NY, VA, WV.

LEAF SPOT. **Cercospora podophylli**, IL; **Glomerella cingulata**, DE; **Pezizella oenotherae**, VA; **Phyllosticta podophylli**, NY to AL, AR, WI; **Vermicularia podophylli**, TX, VA.

ROT, Stem. **Rhizoctonia** sp., MO.

RUST. **Puccinia podophylli**, general.

MEADOW-BEAUTY (*Rhexia*)

LEAF SPOT. **Cercospora erythrogena**, AL, DE, MS, TN; **Colletotrichum rhexiae**, DE; **Phyllosticta rhexiae**, FL.

MEADOW-RUE (*Thalictrum*)

DOWNY MILDEW. **Phytophthora thalictri**, CT, NY, WI.

LEAF SPOT. **Ascochyta clematidina** f. sp. **thalictri**, WI; **Cercospora fingens**, IL, WI; **Cercospora filiformis**, WI; **Cylindrosporium thalictri**, IN, KS, WI; **Gloeosporium thalictri**, WI; **Mycosphaerella thalictri**, NJ, NY, VT, WI; **Septoria thalictri**, KS.

POWDERY MILDEW. **Erysiphe polygoni**, MA to PA, IL, ND.

RUST. **Puccinia recondita** (0, I), CO, MI, northeastern and North central states; II, III on grasses; **P. septentrionalis** (0, I), CA, CO, IN, IA; II, III on *Polygonum*, **Tranzschelia pruni-spinosae** (0, I), CO, IN, IA, KS, NE, ND, OH, PA, SD; II, III on *Prunus*, **T. thalictri** (0, III), eastern and central states to CA, ID, MS, NM.

SMUT, Leaf and Stem. **Urocystis sorosporioides**, AZ, MA, NY, UT.

SMUT, White. **Entyloma thalictri**, CT, IL, IN, NY, WI.

MEADOWSWEET (*Filipendula*)

LEAF SPOT. **Cylindrosporium** sp.; **Septoria ulmariae**, CT.

POWDERY MILDEW. **Sphaerotheca macularis**, IN, NY, VT.

RUST. **Triphragmium ulmariae** (0, I, II, III), IN.

## MEDICAGO (Black Medic)

POWDERY MILDEW. **Oidium** sp., CA; **Erysiphe pisi** (on alfalfa), ID, OR.

ROT, Root. **Aphanomyces eutiches**, Race 2 (on alfalfa), IL; **Phoma sclerotoides**, WI.

RUST, Chickpea. **Uromyces ciceris-arietini**, CA.

VIRUS. **Tomato Ringspot**, VT.

## MELOTHRIA

DOWNY MILDEW. **Pseudoperonospora cubensis**, GA, OH, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, WI.

## MENTZELIA (Blazing Star)

LEAF SPOT. **Phyllosticta mentzeliae**, KS, TX; **Septoria mentzeliae**, KS, TX, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, NJ.

RUST. **Puccinia aristidae** (0, I), AZ, CO; II, III on grasses; **Uredo floridana**, FL.

## MERTENSIA (Bluebells, Virginia Cowslip)

DOWNY MILDEW. **Peronospora** sp., MT.

LEAF SPOT. **Septoria poseyi**, OR.

POWDERY MILDEW. **Golovinomyces cichoracearum**, AL, CO, MT, PA, NV, NM, UT, WY.

ROT, Stem. **Sclerotinia sclerotiorum**, CO.

RUST. **Puccinia mertensiae** (III), CO, NV, UT, WY; **P. recondita** (0, I), ID, MT, OR; II, III on grasses.

SMUT, Leaf. **Entyloma serotinum**, IN, IA, MD, VA, WY.

VIRUS. **Cucumber Mosaic**, IL, NJ.

## MESEMBRYANTHEMUM (Fig-Marigold)

NEMATODE, Root Knot. **Meloidogyne** sp., AL, TX.

SOOTY MOLD. **Torula herbarum**, CA.

MILK THISTLE (*Silybum*)

VIRUS. **Tobacco Streak**, CA.

## MIKANIA (Climbing Hempweed)

LEAF SPOT. **Cercospora mikaniae**, MS; **Septoria mikanii**, CT, TX.

RUST. **Puccinia spegazzinii**, AL, FL, MS, NC.

MILKWORT (*Polygala*)

ANTHRACNOSE. **Gloeosporium ramosum**, IN, NJ, WI.

LEAF SPOT. **Cercospora grisea**, MS, NJ, VA; **Septoria consocia**, IN, MI; **S. polygalae**, NY.

RUST. **Aecidium renatum**, NM; **Puccinia andropogonis** var. **polygalina** (0, I), IA, MI, WI; II, III on *Andropogon*; **P. pyrolae** (III), CT, ME, MI, NH, NY, WI.

## MIMULUS (Monkey-Flower)

BACTERIAL, MLO. **California Aster Yellows**, CA.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

LEAF SPOT. **Cercospora mimuli**, MO; **Ramularia mimuli**, CA, NY, OH, WY; **Septoria mimuli**, PA to MS, MO, NE.

NEMATODE, Leaf. **Aphelenchoides ritzemabosi**.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, PA, UT.

RUST. **Puccinia andropogonis** (0, I), MO, WI; II, III on *Andropogon*; **Uredo** sp. (II), WI.

MINT (*Mentha*)

ANTHRACNOSE. **Colletotrichum coccodes**, WA, WI.

CANKER, Stem. **Fusarium** sp., MI, WA; **Alternaria** sp., MI; **Phoma menthae**, OR.



LEAF SPOT. **Cercospora menthicola**, IL, TX; **Phyllosticta decidua**, occasional, ME to OH, IA, WI; **Ramularia menthicola**, CA, ME, MT, OR; **Septoria menthae** (*S. menthicola*), IN, WI.

NEMATODE. **Aphelenchoides parietinus**; **Paralongidorus sylphus**, OR; **Paratylenchus macrophallus**, OR.

NEMATODE, Root Knot. **Meloidogyne hapla**, OR.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CO, IA, UT, WA; **Erysiphe galeopsidis**, IA; **Erysiphe orontii**, CA; **Erysiphe polygoni**, TX; **Sphaerotheca macularis**, WA.

RUST. **Puccinia menthae** (0, I, II, III), East and central states to TX and Pacific Coast, FL; **P. angustata** (0, I), CA, SD, WI; II, III on grasses.

SPOT ANTHRACNOSE. **Sphaceloma menthae**, IN, MD, MI.

VIRUS. **Tobacco Ring Spot**, IN, OR; **Tomato Spotted Wilt**, OR; **Strawberry Latent Ringspot**, OR; **Mint Crinkle**; **Alfalfa Mosaic**; **Mint Vein Bending**, **Arabis Mosaic**, **Mint Virus** (1), (2), and (X), **Cherry Raspberry Leaf**, **Peppermint Latent**, **Cucumber Mosaic**, **Peppermint Stunt**, **Impatiens Necrotic Spot**, **Lychnis Ringspot**, **Tomato Aspermy**, OR.

WILT. **Verticillium albo-atrum** f. sp. *menthae* (*V. dahliae*), IN, MI, OR.

Rust is serious in mints grown commercially, in greenhouses or in the field. Overwintering spores can be killed by treating rhizomes with hot water. Spot anthracnose is largely controlled by thorough coverage when mint is plowed under in the fall. Mint in the backyard is too prolific for worry about disease.

MISTLETOE (*Phoradendron*)

BLACK MILDEW. **Asterina phoradendricola**, FL.

BLIGHT, Brown Felt. **Herpotrichia juniperi**, CA.

BLIGHT, Leaf. **Sphaeropsis visci**, SC, TX; **Phyllosticta phorodendri**, CA.

BLIGHT, Twig. **Nectria cinnabarina**, TX.

CANKER. **Cystospora pinicola**, OR, WA; **Hymenochaete agglutinans**, AL.

CANKER, Felt Fungus. **Septobasidium pseudopedicellatum**, FL.

DODDER. **Cuscuta exaltata**, TX.

LEAF SPOT. **Cercospora struthanthi**, FL; **Exosporium phoradendri**, TX; **Phytophthora ramorum**, CA.

RUST. **Peridermium bethelii**, CO; **Uredo phoradendri**, CA, OR.

If you treasure mistletoe for Christmas greens, you will be sorry it has diseases; but if you consider mistletoe a pest, you'll wish the above list were longer.

MISTLETOE, DWARF (*Arceuthobium* spp.)

BLIGHT, Brown Felt. **Herpotrichia juniperi**, CA.

RUST. **Peridermium bethelii**, CO.

SPOT, SHOOT, LESION. **Colletotrichum gloeosporioides**.

MOCK-CUCUMBER (*Echinocystis*)

ANTHRACNOSE. **Colletotrichum lagenarium**, FL.

DOWNY MILDEW. **Plasmopara australis**, IA, KS, MN, OH, WI; **Pseudoperonospora cubensis**, OH.

LEAF SPOT. **Cercospora echinocystis**, NY to FL, NE, WI; also fruit spot; **Septoria** spp., widespread; **Alternaria** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, WI.

VIRUS. **Beet Curly Top**, CA; **Cucumber Mosaic**, CA, CO, IL, IN, MI, NY, WI.

WILT. **Fusarium** sp., FL.

MOCK-STRAWBERRY (*Duchesnea*)

DOWNY MILDEW. **Peronospora potentillae**, NC.

GALL, Leaf. **Synchytrium globosum**, SC.

LEAF SPOT. **Pezizella oenotherae**, VA.

RUST. **Frommeella duchesneae** (0, I, II, III), NH to FL, KY; **Frommeella duchesneae**, IN.

MONARDELLA

LEAF SPOT. **Phyllosticta monardellae**, CA.

RUST. **Puccinia menthae** (0, I, II, III), CA, NV, NM, OR, UT.

MONESSES (Wood-Nymph)

RUST. **Chrysomyxa pirolata** (II, III). AK, CO, ME, MI, MT, NM, WA, WY; 0, I on spruce.

MONKSHOOD, ACONITE (*Aconitum*)

BACTERIAL Leaf Spot. **Pseudomonas delphinii**, ME, NJ.

DOWNY MILDEW. **Plasmopora pygmaea**, AK.

NEMATODE, Root Knot. **Meloidogyne** sp., NY, VT.

POWDERY MILDEW. **Erysiphe polygoni**, NY, TX, WV.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, CT, NJ.

ROT, Stem. **Sclerotinia sclerotiorum**, CO; **Sclerotium rolfsii**, CT, DE, MN, NJ, NY.

RUST. **Puccinia recondita** (0, I), CO, AK; II, III on grasses; **Uromyces lycocotoni** (0, I, II, III), CA, CO, TX, UT, WY.

SMUT, Leaf and Stem. **Urocystis carcinodes**, UT; **U. sorosporioides**, UT.

VIRUS. **Mosaic**, Unidentified, NY.

WILT. **Verticillium albo-atrum**, MA, NJ, NY, OH.

Verticillium wilt is doubtless more widespread in monkshood than the official reports indicate. The leaves dry along the stem, flowers are poor, and when the stem is cut across, blackened bundles are readily seen. The clumps do not die immediately but decline over a period of years.

MONTIA (Indian Lettuce)

SMUT, Seed. **Ustilago claytoniae**, WA.

MOONFLOWER (*Calonyction*)

LEAF SPOT. **Phyllosticta** sp., NJ.

NEMATODE, Leaf. **Aphelenchoides fragariae**, NJ.

NEMATODE, Root Knot. **Meloidogyne** sp., NJ, SC.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium ipomoeae** (II, III), AL, NC, SC, TX; 0, I on pine.

WHITE RUST. **Albugo ipomoeae-panduratae**, FL.

MOONSEED (*Menispermum*)

LEAF SPOT. **Cercospora menispermi**, NY to VA, KS, WI; **Colletotrichum sordidum**, WI; **Phyllosticta menispermicola**, IL; **Septoria abortiva**, IL, KS.

POWDERY MILDEW. **Microsphaeraalni**, widespread.

SMUT, Leaf. **Entyloma menispermi**, PA to VA, KS, ND.

MOREA

RUST. **Puccinia iridis**, FL.

MORINDA (Royoc, Indian-Mulberry)

LEAF SPOT. **Cercospora morindicola**, FL.

SPOT ANTHRACNOSE. **Sphaceloma morindae**.

MOTHERWORT (*Leonurus*)

BLACK MILDEW. **Dimerosporium hispidulum**, TX.

LEAF SPOT. **Ascochyta leonuri**, LA; **Phyllosticta decidua**, OH, TX, WI; **Septoria lamii**, PA.

VIRUS. **Mosaic**. Unidentified, IN.

MOUNTAIN-MINT (*Pycnanthemum*)

GALL, Leaf. **Synchytrium cellulare**, WI.

LEAF SPOT. **Cercoseptoria blephiliae**, WI; **Cercospora pycnanthemi**, AL.

RUST. **Puccinia angustata** (0, I), IN; **P. menthae** (0, I, II, III), MA to VA, AL, CA, IA, OK, TX.

MOUNTAIN-SORREL (*Oxyria*)

RUST. **Puccinia oxyriae** (II, III), AK, CA, CO, ID, OR, UT; 0, I unknown.

SMUT, Floral. **Ustilago vinosa**, AK, CA, CO, WA, WY.

MULLEIN (*Verbascum*)

DOWNY MILDEW. **Peronospora sordida**, NJ.

LEAF SPOT. **Cercospora verbasicola**, TX; **Phyllosticta verbasicola**, IN, KS, TX; **Ramularia variabilis**, NY to MS, TX, WA; **Septoria verbasicola**, TX, NY to AL, MO, TX.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA; **Oidium** sp., NJ.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Tomato Ringspot**, VT.

MUSK-ROOT (*Adoxa*)

GALL, Leaf. **Synchytrium anomalum**, IA.

LEAF SPOT. **Phyllosticta adoxae**, CO.

RUST. **Puccinia adoxae** (III), CO, UT, WY; **P. argentata** (0, I), IA, MN, WI; II, III on *Impatiens*.

# N

## NEMATANTHUS

LEAF SPOT. **Myrothecium roridum**, FL.

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

NEMOPHILA (Baby Blue-Eyes)

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, NV, TX, WA.

NETTLE (*Urtica*, *Urera*)

NEMATODE, Soybean Cyst.

NIGHTSHADE, Silverleaf (*Solanum elaeagnifolium*)

Weed found in dry, open woods, prairie, waste places, and disturbed soil in Southwest, U.S.

BLIGHT, Late. **Phytophthora infestans**, NY.

NEMATODE, Foliar. **Nothanguina phyllobia**, TX.

VIRUS. **Tomato Spotted Wilt**, CA.

NIGHTSHADE, HAIRY AND CLIMBING (*Solanum sarrachoides*, *S. dulcamara*)

BLIGHT. **Phytophthora infestans**, ME, NY.

VIRUS. **Potato Leafroll**, Pacific Northwest.

NOTHOSCORDUM (False Garlic)

ANTHRACNOSE. **Colletotrichum circinans**, OK.

RUST. **Uromyces hordeinus** (0, I), KS, OK, TX; II, III on grasses; **U. primaverilis** (0, I, III), IL, MO, TX.

VIRUS. **Nothoscordum Mosaic**, LA.

NUTSEDGE (*Cyperus rotunders*) Grass-like

BLIGHT, Flower. **Balansia cyperi**, LA.

LEAF SPOT. **Dactylaria higginsii**, FL; **Sclerotinia minor**, NC.

NEMATODE, Cyst. **Heterodera moths**, GA.

NEMATODE, Root-knot. **Meloidogyne graminicola**, GA.

ROT, Root. **Pythium arrhenomanes**, LA.

RUST. **Puccinia canaliculata**, GA.

VIRUS. **Impatiens Necrotic Spot Phytoplasma**, GA.

NYMPHOIDES (Floating-Heart) Water Plants

RUST. **Puccinia scirpi** (0, I); II, III on *Scirpus*, FL.

SMUT, Leaf. **Burrillia decipiens**, NJ.

# O

ONOSMODIUM (Marbleseed)

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia recondita** (0, I), CO, KS, NE, ND.

ORCHIDS (*Dendrobium*)

BLIGHT, Flower and Leaf; Rot, Root. **Fusarium proliferatum**, **F. solani**, **F. oxysporum**, **F. subglutinans**, HI.

ORCHIDS (Native Species)

LEAF SPOT. **Cercospora cypripedii**, NY, WI; **Fusicladium aplectri**, DE; **Mycosphaerella cypripedii**, NY; **Phyllosticta aplectri**, DE; **Septoria calypsonis**, MI.

RUST. **Puccinia praegracilis** (*Aecidium graebnerianum*) (I), AK, CA, MT, OR, WA; **P. cypripedii** (II, III), IN, IA, MI, NJ, VA, WI; **Uredo goodyerae** (II, III), CA, CO, NM, OR, WA.

OWLS CLOVER (*Orthocarpus*)

LEAF SPOT. **Ascochyta garrettiana**, OR, UT.

RUST. **Cronartium coleosporioides** (II, III), CO, ID, UT; 0, I on pine.

OXALIS (Wood-Sorrel)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

LEAF SPOT. **Cercospora oxalidiphila**, WI; **Phyllosticta guttulatae**, VT to NJ, IN, WI, **Ramularia oxalidis**, NE, NH, NM, OR, PA, TN, VT; **Septoria acetosella**, NY; tar spot, **Phyllachora oxalina**, DE, ME, VT.

NEMATODE, Root Knot. **Meloidogyne** spp.

NEMATODE, Stem. **Ditylenchus dipsaci**, NY.

POWDERY MILDEW. **Microsphaera russellii**, ME to WV, KS, MN, WA.

ROT, Root. **Thielaviopsis basicola**, CT.

RUST. **Puccinia andropogonis** (0, I), OK, TX, II, III on *Andropogon*; **P. oxalidis** (II, III), FL, GA, LA, MS, NM, SC, TN, TX, WI; 0, I on mahonia; **P. sorghi** (0, I), IN, IA, KS, MI, MS, ND, OK, SD, TX; II, III on corn and *Euchlaena*.

SMUT, Seed. *Ustilago oxalidis*, CT to MS, OH, TX, WI.

VIRUS. **Beet Curly Top**, TX; **Tomato Ringspot**, PA; **Tomato Spotted Wilt**, PA;  
**Shamrock Chlorotic Ringspot**.

# P

PAINTED CUP, INDIAN PAINTBRUSH (*Castilleja*)

LEAF SPOT. **Cercospora** sp., AK.

POWDERY MILDEW. **Erysiphe polygoni**, CO, WA; **Sphaerotheca macularis**, CO, WA, WI.

RUST. **Cronartium coleosporioides** (II, III), CA, CO, SD to NM, UT, WA, WY; 0, I on pine; **Puccinia andropogonis** (0, I), CA, IA MT, NM, WI; II, III on *Andropogon*; **P. castillejae** (II, III), CA, UT.

PARROTFEATHER (*Myriophyllum*)

ROT, Root and Stem. **Pythium carolinianum**, CA.

PARTRIDGE-BERRY (*Mitchella*)

BLACK MILDEW. **Meliola mitchellae**, AL, FL, MS, PA.

ROT, Stem. **Sclerotium rolfsii**, MD.

PASSION FLOWER (*Passiflora*)

ANTHRACNOSE, Postharvest. **Colletotrichum boninense**, **C. capsici** and **Glomerella** sp., FL.

BLIGHT, Southern. **Sclerotium rolfsii**, FL.

LEAF SPOT. **Colletotrichum gloeosporioides**, FL, also stem spot; **Cercospora biformis**, AR, NC; **C. fuscovirens**, ME to MO, TX; **C. regalis**, TX; **C. truncatella**, SC, TX; **Gloeosporium fructigenum**, LA; **Phyllosticta** sp., NJ; **Alternaria passiflorae**, FL, brown spot.

NEMATODE, Root Knot. **Meloidogyne** sp.

PHYTOPLASMA. Costa Rica.

ROT, Collar. **Sclerotinia** sp., CA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Cucumber Mosaic**, CA; **Passiflora Latent**, FL.

VIRUS, Chlorosis. **Bean Common Mosaic**, FL.

WILT, Fusarium. **Fusarium oxysporum** f. sp. **passiflora**, CA.

PETALOSTEMON (Prairie-Clover)

ROT, Root. **Phymatotrichum omnivorum**, TX.



RUST. **Puccinia andropogonis** (0, I), ND to KS, CO, TX, WY; **Uropyxis petalostemonis** (0, I, II, III), WI to ND, CO, NM.

PETASITES (Butter-Bur)

GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Ramularia variegata**, WI; **Stagonospora petasitidis**, WI.

RUST. **Puccinia conglomerata**, MI, MN, NY, WI; **P. poarum**, AK.

PHILIBERTIA

POWDERY MILDEW. **Phyllactinia corylea**, FL.

RUST. **Puccinia bartholomaei** (0, I), AZ; **P. obliqua** (III), AZ, CA, FL, NM, TX.

PICK-A-BACK (*Tolmiea*)

POWDERY MILDEW. **Sphaerotheca** sp., OR.

VIRUS. **Tomato Spotted Wilt**, PA.

PIPSISSEWA (*Chimaphila*)

LEAF SPOT. **Mycosphaerella chimaphilina**, NY, OR, PA, WA; **Septoria chimaphilae**, DE.

RUST. **Pucciniastrum pyrolae** (II, III), NY to NC, CA, MT, OR, TN, WA, WI.

PITCHER-PLANT (*Sarracenia*)

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Colletotrichum gloeosporioides**, NJ, TX; **Helminthosporium sarracenia**, secondary, MN; **Mycosphaerella sarraceniae**, GA, ME, MI, MN, MS, NY, PA, SC; **Pestalotia aquatica**, secondary, MD, MN.

ROT, Root. **Pythium graminicola**, NC; **Rhizoctonia solani**, TX.

PLANTAIN, Common (*Plantago*)

VIRUS. **Tomato Ringspot**, PA; **Plantago Mottle**, NY; **Ribgrass Mosaic**, NY.

POISON HEMLOCK (*Conium*)

VIRUS. **Alfalfa Mosaic**, WA; **Clover Yellow Vein**, WA; **Apium Virus Y**, WA.

POISON IVY (*Rhus radicans* = *Toxicodendron radicans*)

BLIGHT, Twigs. **Botryopheria obtusa**.

CANKER, Limbs and Trunk. **Valsa ceratosperma**, GA.

LEAF SPOT. **Alternaria** sp., WV; **Cercospora** sp., FL; **Stigmina pallida**, CO, TX; **Colletotrichum** sp., CA; **Discosia artocress**, MS; **Gleospodium toxicotrichum**, eastern states, KS, MS, MT, OK; **Phoma** sp., NC; **Phyllosticta rhoicola**, MS, NY, TX, WA, WV; **Phyllosticta toxicodendri**, SC; **Phyllosticta** sp., WI; **Septoria rhoina**, ID; **Tubakia dryina**, IL.

ON LEAVES. **Cristulariella moricola**, AL, GA; **Collectogloem rhois**, NJ.

POWDERY MILDEW. **Phyllatinia gutata**, WA, MI.

RUST. **Pileolaria brevipes**, AZ; **Pileolaria effuca**, AZ.

STEMS. **Discosia rhoina**, CO, IL, NJ; **Discosia toxica**, CO, IL, NJ; **Botrydiplodia compressa** f. **toxicodendrum**, NY.

TRUNKS and WOOD. **Bjerkandera adusa**, MD, WV; **Daedaleopsis confragosa**, NC; **Dendrophora albobadia**, GA; **Perenniporia medulla-panis**, MI; **Phellinus**

**gilvus**, MD; **Schizophyllum commune**, VA; **Trametes hirsute**, MD; **Trametes versicolor**, MD, ND; **Dothidea puccinoides**, GA; **Diaporthe spiculosa**, IL, MA, NJ, NY; **Hainesia lythri**, WI; **Hypoxylon rubiginosum**, GA; **Rhytidhysteron rufulum**, GA.

POISON OAK (*Toxicodendron diversilobum*, West Coast and *Toxicodendron pubescens*, East Coast)

BLIGHT, Leaves. **Cristulariella moricola**, GA; **Colletogloenon rhois**, NJ; **Phyllosticta toxica**, IA, IL, MS, SC, WV.

BLIGHT, Stems. **Diaporthe peckii**, NJ; **Botryodiplodia compressa** f. **toxicodendron**, NY; **Dothiella radicans**, CO, IL, NJ; **Dothiella rhoina**, CO, IL, NJ; **Dothiella toxica**, CO, IL, NJ.

LEAF SPOT. **Stigmia pallid**, CO, ID, TX; **Discosia artocreas**, MS; **Gloeosporium toxicodendri**, eastern states, KS, MS, MT, OK; **Phyllosticta rhoicola**, MS, NY, TX, WA, WV; **Phyllosticta toxicodendri**, SC; **Septoria rhoina**, ID, **Tubakia dryina**, IL.

POWDERY MILDEW. **Phyllactinia guttata**, WA.

ROT, Decline. **Hypoxylon rubiginosum**, GA; **Valsa ceratosperma**, GA; **Pileolaria effusa**, AZ, CO; **Stereum hirsutum**, NC.

ROT, Limb. **Diaporthe spiculosa**, IL; **Rhytidhysteron rufulum**, GA.

ROT, Root. **Dasyscyphus corticalis**, WA.

ROT, Trunk. **Bjerkanderea adusta**, MD, WV.

ROT, Wood. **Dendrophora albobadia**, GA; **Perenniporia medulla commune**, MI; **Schizophyllum commune**, VA; **Trametes versicolor**, MD, NC.

POISON SUMAC (*Rhus radicans* = *Toxicodendron vernix*)

BLIGHT, Canker. **Botryosphaeria obtuse**, KS, MI, SC.

BLIGHT, Canker and Dieback. **Amphiporthe aculens**, eastern states, IA, GA.

BLIGHT, Stem. **Diaporthe peckii**, MI.

LEAF SPOT and DIEBACK. **Discohainesia oenotherae**, eastern states, WV; **Cercospora toxicodendri**, DE; **Pseudocercospora rhoina**, WI.

POWDERY MILDEW. **Sphaerotheca macularis**, eastern and central states.

ROT, Limbs. **Dendrophora albobadia**, GA.

ROT, Root. **Phymatotrichopsis omnivore**, TX.

ROT, Trunk. **Bjerkandera adusta**, Range of Host; **Irpex lacteus**, Range of Host; **Phellinus gilvus**, MI; **Schizophyllum commune**, Range of Host; **Steccherinum ochraceum**, PA; **Steccherinum ochraceo-flaveum**, MD; **Trametes hirsuta**, Range of Host; **Trametes versicolor**, Range of Host; **Trichapnum bifforme**, Range of Host.

PORTULACA

BLIGHT, Stem. **Dichotomophthora indica**, VA.

DAMPING-OFF. **Rhizoctonia solani**, IL; **Helminthosporium (Bipolaris) portulacae**, NC.

NEMATODE, Root Knot. **Meloidogyne** sp., AL.

ROT, Black Stem. **Dichotomophthora portulacae**, CA, TX.

VIRUS. **Beet Curly Top**, CA; **Tomato Spotted Wilt**, NY.

WHITE RUST. **Albugo portulacae**, MT to GA, MT, TX.

PRENANTHES (Rattlesnake-Root)

DOWNY MILDEW. **Bremia lactucae**, IA, MA, MN.

GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Cercospora brunnea**, AR, NC, WI; **C. prenanthis**, AL, IN, KS; **C. tabacina**, WI; **Laestadia prenanthis**, AL; **Septoria nabali**, NY to IA, WI, ME to VA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, IL, MD, NC, PA; **Sphaerotheca macularis**, NY to AL, IL, MN, OH, PA.

RUST. **Puccinia atropuncta** (0, I), PA, VA; II, III on *Amianthium*; **P. dioicae** (0, I), IL, MN, NY, VA, WI; II, III on *Carex*; **P. insperata** (I, II, III), OR; **P. orbicula** (0, I, II, III), ME to TN, ND.

PRIMROSE (*Primula*)

BACTERIAL Leaf Spot. **Pseudomonas primulae**, CA.

BACTERIAL, MLO. **California Aster Yellows**.

BLIGHT, Gray Mold. **Botrytis cinerea**, frequent in greenhouses, occasional in gardens.

LEAF SPOT. **Ascochyta primulae**, WI; **Asteroma garretianum**, black spot, CO, UT; **Cercospora primulae**, WA; **Colletotrichum primulae**, FL; **Mycosphaerella** sp., AZ; **Ramularia primulae**, CA, CT, DE, NY.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, CA, MD, PA.

NEMATODE, Root Knot. **Meloidogyne** spp., occasional in greenhouses.

NONPARASITIC. **Chlorosis**. Excessive soil acidity or iron or magnesium deficiency.

POWDERY MILDEW. **Erysiphe polygوني**, CT, NJ, VA.

ROT, Root. **Pythium irregulare**, CA; **Rhizoctonia solani**, FL, IL, TX; **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Alternaria** sp., CT; **Sclerotinia sclerotiorum**, MD.

RUST. **Puccinia aristidae** (0, I), ME; **Uromyces apiosporus**, CA, NV.

VIRUS. **Primrose Mosaic**; **Cucumber Mosaic**; **Tobacco Necrosis**; **Tomato Spotted Wilt**; **Impatiens Necrotic Spot**, NC.

PRUNELLA (Self-Heal, Heal-All)

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Gibberidea abundans**, tar spot, ME, WA; **Linospora brunellae**, AK, ID, WA; **Phyllosticta brunellae**, TX; **Ramularia brunellae**, IL, IN, NY, OH, TX, VA, WI; **Septoria brunellae**, general.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA; **Sphaerotheca macularis**, IL, IN, MD, MS, WA, WI.

ROT, Root. **Pythium palingenens**; **P. polytylum**, VA.

VIRUS. **Tomato Ringspot**, VT.

PUNCTURE VINE (*Tribulus*)

VIRUS. **Tomato Spotted Wilt**, General.

PYROLA (Shinleaf)

BLIGHT, Gray Mold. **Botrytis cinerea**, MD.

LEAF SPOT. **Mycosphaerella chimaphilae**, MI; **Ovularia pyrolae**, WI; **Ramularia pyrolae**, WI; **Phyllosticta pyrolae**, DE, MT, WI; **Septoria pyrolae**, MI.

RUST. **Chrysomya piriolata** (II, III), general from ME to MN and from MT to CA, AK; 0, I on spruce; **Pucciniastrum pyrolae** (II, III), general in West.

# Q

QUEEN ANNE'S LACE, FALSE (*Ammi majus*)  
VIRUS. **Mosaic, Clover Yellow Vein Potyvirus, FL.**

# R

## RAGWEED (*Ambrosia*)

BACTERIAL Blight. **Pseudomonas syringae** pv. **tagetis**, WI.

DOWNY MILDEW. **Plasmopara halstedii**, ND.

GALLS, Stem. **Protomyces gravidus**, LA.

LEAF SPOT. **Phoma** sp.

ROT, ROOT. **Rhizoctonia solani**, TX.

## RAIN-LILY (*Cooperia*)

LEAF SPOT. **Cercospora amaryllidis**, TX.

RUST. **Puccinia cooperiae** (0, I, II, III), TX.

## RANUNCULUS (Buttercup, Crowfoot)

BLIGHT, Gray Mold. **Botrytis cinerea**, CA, NY, WI.

BACTERIAL, MLO. **California Aster Yellows**.

BACTERIAL NECROTIC LESION, LEAF, STEM. **Xanthomonas campestris**, CA.

DOWNY MILDEW. **Peronospora ficariae**, occasional MA to MD, IA, MN; also CA.

GALL, Leaf. **Synchytrium anomalum**, IA; **S. aureum**, CA, IL, WI; **S. cinnamomeum**, WI.

LEAF SPOT. **Ascochyta infuscans**, WI; **Cercospora ranunculi**, IA, WI; **Cylindrosporium ficariae**, WA; **Didymaria didyma**, IL, IN, IA, MA, MI, MS, NY, WI; **Fabraea ranunculi**, CA, NE, NY, WI; **Ovularia decipiens**; **Ramularia aequivoca**, IL, IA, OR, WI; **R. didyma**, CA; **Septocylindrium ranunculi**, IL, NY, WA, WI; **Septoria** sp.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, OR.

POWDERY MILDEW. **Erysiphe polygoni**, frequent in eastern and central states; **Sphaerotheca macularis**, CO.

ROT, Leaf. **Ceratobasidium anceps**, WI.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, AZ, CA; **Pythium** sp., CA; **Sclerotium rolfsii**, CA.

RUST. **Puccinia andina** (III), IL, IN; **P. eatoniae** var. **ranunculi** (0, I), CT to SC, CA, CO, MS, ND; II, III, on *Sphenopholis*; **P. ranunculi** (III), AZ, CO, UT, WA, WY, **P. recondita** (0, I), WI to TX, CA, WA; III on *Hordeum*; **Uromyces dactylidis** (0, I), CO, MA, TX; **U. jonesii** (0, I, III), CA, CO, MT, WY.

SMUT, Leaf. **Doassansia ranunculina**, IN, WI; **Urocystis anemones**, IL, UT, WY.

SMUT, White. **Entyloma microsporium**, IL, IN, IA, KY, VA, WI; **E. ranunculi**.

VIRUS. **Beet Curly Top**; **Ranunculus Mottle**; **Ranunculus Mosaic**; **Impatiens Necrotic Spot**, NC; **Tomato Spotted Wilt**, PA.

RATIBIDA (Prairie Coneflower)

DOWNY MILDEW. **Plasmopara halstedii**, IA.

LEAF SPOT. **Cercospora ratibida**, KS, WI; **Physalospora lepachydis**, MT; **Ramularia rudbeckiae**, ID; **Septoria infusata**, MI, MO, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, ND, TX.

ROT, Violet Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

RUST. **Uromyces perigynius** (0, I), ND, TX; II, III on *Carex*.

SMUT, White. **Entyloma compositarum**, NE, MI to IN, KS, MN.

REDWEED (*Melochia*)

CANKER, Stem. **Diaporthe phaseolorum** var. **caulivora**, LA.

RHEXIA (Deergrass, Meadow-Beauty)

LEAF SPOT. **Cercospora erythroga**, AL DE, MS, TN; **Colletotrichum rhexiae**, DE; **Phyllosticta rhexiae**, FL.

RHOEO

VIRUS. **Tobacco Mosaic**, MD.

ROCK-JASMINE (*Androsace*)

DOWNY MILDEW. **Peronospora candida**, KS.

LEAF SPOT. **Mycosphaerella primulae**, NM.

RUST. **Puccinia volkartiana** (III), AK.

ROMANZOFFIA

RUST. **Puccinia romanzoffiae** (III), OR.

ROSE-GENTIAN (*Sabatia*)

ANTHRACNOSE. **Gloeosporium** sp., OK.

LEAF SPOT. **Cercospora sabbatae**, DE, MS, NC, OK, TX.

ROSE – MALLOW (*Hibiscus palustris*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, MS.

DIEBACK. **Colletotrichum hibisci**, NJ, NY, TX.

LEAF SPOT. **Ascochyta abelmoschi**, NY; **Cercospora kellermanii**, IN; **Phyllosticta hibiscina**, CT, FL, LA, MD, NJ, NY; **Septoria** sp., NJ.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia schedonnardi** (0, I), CT to AL, NE, TX; II, III on grasses.

ROUGE-PLANT (*Rivina*)

LEAF SPOT. **Cercospora flagellaris**, FL, TX; **Septoria rivinae**, TX.

ROT, Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia raunkaerii** (0, I, II, III), FL, TX.

RUE ANEMONE (*Anemonella*)

LEAF SPOT. **Cercospora caulophylli**, MO.

POWDERY MILDEW. **Erysiphe polygoni**, IA.

RUST. **Puccinia recondita** (0, I), IN, IA, MO.

SMUT, Leaf and Stem. **Urocystis anemones**, NY.

## RUELLIA

BLIGHT, Southern. **Sclerotium rolfsii**, LA.

LEAF SPOT. **Cercospora consociata**, AL, IL, IA, MS, MO.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia lateripes** (0, I, II, III), MD to FL, KS, MO, TX; **Uromyces ruelliae** (0, I, II, III), TX.

## RUMEX (Garden Sorrel)

BACTERIAL, MLO. **California Aster Yellows**, CA.

GALL, Leaf. **Synchytrium anomalum**, IA.

LEAF SPOT. **Cercospora acetosellae**, LA, TX; **Phyllosticta** sp., NY; **Gloeosporium rumicis**, NY, TX; **Septoria pleosporioides**, TX.

NEMATODE, Ring. **Criconemella xenoplax**, SC.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

ROT, Root. **Rhizoctonia solani**, TX.

RUST. **Puccinia acetosae** (II, III), ME to FL.

VIRUS. **Tomato Ringspot**, PA.

RUSSIAN KNAPWEED (*Acroptilon repens*)

LEAF SPOT. **Cercospora acroptili**, MT.

RUST. **Puccinia acroptili**, CO, MT, WY.



# S

## SAFFLOWER (*Carthamus*)

ANTHRACNOSE; Blight. **Gloeosporium carthami**, IN, TX, VA.

BACTERIAL Blight. **Pseudomonas syringae**, CA.

BLIGHT. **Botrytis cinerea**; **Rhizoctonia** sp., NM.

LEAF SPOT. **Alternaria** spp., AZ, CA, IN, MT, NE, ND; **Septoria carthami**, IN, TX; **Stemphylium** sp., FL; **Cercospora beticola**, MT; **Ramularia carthami**, **Ramularia cercosphaelloides**, Sonora, Mexico.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA.

ROT, Root. **Phytophthora drechsleri**, CA.

ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, IN, ND, VA.

RUST. **Puccinia carthami** (II, III), CO, MA, MT, NE, ND.

VIRUS. **Cucumber Mosaic**, AZ, CA; **Turnip Mosaic**, CA.

WILT. **Fusarium oxysporum** f. sp. **carthami**; **Verticillium albo-atrum**.

## ST. JOHNSWORT (*Hypericum*)

BLACK KNOT. **Gibberidea heliopsidis**, MD.

BLIGHT, Leaf. **Rosellinia (Dematophora) necatrix**; **Diploceras hypericum** (stem and leaf), OR.

BLIGHT, Southern. **Sclerotium rolfsii**, SC.

GALL, Stem. **Sphaeropsis tumefaciens**, FL.

LEAF SPOT. **Cercospora hyperici**, IL; **Cladosporium gloeosporioides**, AL, NJ, NY, WI.

NEMATODE, Root Knot. **Meloidogyne** spp.

POWDERY MILDEW. **Golovinomyces cichoracearum**.

RUST. **Melampsora hypericorum** (II), MT; **Uromyces triquetrus** (0, I, II, III), ME to AL, and IA, TX, WI.

## SALSIFY (*Tragopogon*)

BACTERIAL, MLO. **California Aster Yellows**, CA; **Aster Yellows**, MD, NY, PA, WI.

BACTERIAL Soft Rot. **Erwinia carotovora**, CT, TX.

BLIGHT, Leaf. **Sporodesmium scorzonerae**, AL, MD, NY, PA, VA, WV.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Cercospora tragopogonis**, MT, OK; **Stemphylium botryosum**, NY;  
**Alternaria tenuis**.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp., NY to AL, TX, WA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general.

ROT, Root. **Phymatotrichum omnivorum**, AZ, TX; **Rhizoctonia solani**, TX, WA.

ROT, Stem, Crown. **Sclerotinia intermedia**, IL; **S. sclerotiorum**, IL.

VIRUS. **Beet Curly Top**; **Lettuce Mosaic**, NY.

WHITE RUST. **Albugo tragopogonis**, CA.

WILT. **Verticillium albo-atrum**, NY.

SALSIFY, BLACK (*Scorzonera*)

BACTERIAL, MLO. **California Aster Yellows**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

WHITE RUST. **Albugo tragopogonis**, CA.

SALVINIA (*Aquatic Fern*)

LEAF SPOT, Water-Soaked Lesions. **Rhizoctonia solani**, FL.

SAND-VERBENA (*Abronia*)

DOWNY MILDEW. **Peronospora oxybaphi**, TX.

LEAF SPOT. **Heterosporium abroniae**, CA, TX.

RUST. **Puccinia aristidae**, AZ, CA, CO, NM; II, III on grasses.

SANDVINE (*Ampelanus*)

BLACK MILDEW. **Meliola bidentata**, NC.

DOWNY MILDEW. **Plasmopara gonolobi**, SC.

LEAF SPOT. **Cercospora gonolobi**, OK; **Septoria** sp., LA.

RUST. **Puccinia obliqua** (III), OK, TX.

SANDWORT (*Arenaria*)

LEAF SPOT. **Hendersonia tenella**, TX.

POWDERY MILDEW. **Erysiphe polygoni**, CA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia arenariae** (III), CA, FL, MT, NY, TX, WI; **P. tardissima**, CO, NM,  
UT, WY; **Uromyces inaequaltus** (0, I, II, III), CO, UT.

SMUT, Anther. **Ustilago violacea**, ME, NH, NY, VT.

SANGUISORBA (Burnet)

LEAF SPOT. **Graphium sessile**, NY; **Ovularia bulbiger**, AK, IL.

POWDERY MILDEW. **Podosphaera oxyacanthae**, IA; **Sphaerotheca macularis**,  
AK, KS, NY, PA.

RUST. **Xenodochus carbonarius** (I, III), AK; **X. minor**, AK.

SAURURUS (Swamp-Lily, Water Dragon)

GALL, Leaf. *Physoderma* sp., VA.

LEAF SPOT. **Cercospora saururi**, AL, FL, IL, IN, LA, NY, TX; **Ramularia saururi**,  
OK.

NEMATODE, Root Knot. **Meloidogyne** sp.

SAXIFRAGE (*Saxifraga*)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

LEAF SPOT. **Cercospora saxifragae**, WI; **Phyllosticta saxifragarum**, WY;  
**Septoria albicans**, WI; **Ramularia** sp., AK.

POWDERY MILDEW. **Sphaerotheca macularis**, AK, CO, NY, PA, WY.

RUST. **Melampsora arctica** (0, I), AK, CO; II, III on willow; **Puccinia heucherae** (III), AK, MT to NM, ID, WA, WY, NY to IL, MT; **P. pazschkei** (III), ID, MT, WA; and var. **tricuspidatae**, CO, UT.

VIRUS. **Impatiens Necrotic Spot**, NC.

SCHEFFLERA (*Brassaia actinophylla* = *Scheffiera actinophylla*)

BACTERIAL Blight. **Pseudomonas cichorii**, FL.

LEAF SPOT. **Alternaria panax**, CA, FL.

NEMATODE, Root Knot. **Meloidogyne incognita**.

ROT, Stem, Leaf, Cutting. **Fusarium solani**, FL.

VIRUS. **Ghost Ring**; **Scheffiera Ringspot**.

SCHEFFLERA, DWARF (*Scheffiera arboricola*)

BACTERIAL Leaf Blight. **Pseudomonas cichorii**, FL.

LEAF SPOT. **Alternaria** sp. FL.

## SCHRANKIA

RUST. **Ravenelia morongiae**, TX.

STEM SPOT. **Cercospora morongiae**, MS.

## SCILLA (Squill)

LEAF SPOT. **Embellisia hyacinthi**, CA.

NEMATODE, Bulb. **Ditylenchus dipsaci**, VA.

ROT, Blue Mold. **Penicillium gladioli**, on imported bulbs.

ROT, Bulb. **Sclerotium rolfsii**, WA.

SMUT, Flower. **Ustilago vaillantii**, MA, WA.

VIRUS. **Ornithogalum Mosaic**, NY.

SEDUM (*Stonecrop*)

BLIGHT, Southern. **Sclerotium rolfsii**, KS, NJ, VA.

LEAF SPOT. **Septoria sedi**, IL, IA, ME, NY; **Pleospora** sp., NY; **Stemphylium bolickii**, FL.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Erysiphe sedi**, NY.

ROT, Stem. **Colletotrichum** sp. (*Vermicularia benficiens*), NY, VA; **Phytophthora** sp., NY; **Rhizoctonia solani**, IL, NJ.

RUST. **Puccinia rydbergii** (III), UT; **P. umbilici** (III), CO, WY.

VIRUS. **Tomato Spotted Wilt**, PA.

VIRUS, Foliar Ringspot. **Tobacco Rattle Virus**, MN.

WILT. **Fusarium oxysporum** f. sp. **sedi**, CA.

## SEMPERVIVUM (Houseleek)

ROT, Leaf and Stem. **Phytophthora parasitica**, NY.

ROT, Root. **Pythium** sp., IA.

RUST. **Endophyllum sempervivi** (III), MA, NJ, NY.

SERIOCARPUS (White-Topped Aster)

RUST. **Coleosporium asterum** (II, III), CT; **Puccinia dioicae** (0, I), IN, NC, TN.

SESAME (*Sesamum*)

BACTERIAL Leaf Spot. **Pseudomonas sesami**, KS, TX.

BACTERIAL Wilt. **Pseudomonas solanacearum**, AZ.

BLIGHT. **Corynespora cassiicola**, MS, Southeast.

LEAF SPOT. **Alternaria sesami**, Southeast; **A. tenuissima**, TX; **Cercospora sesami**, FL, GA, SC; **Cylindrocladium sesami**, FL, SC; **Helminthosporium sesami**, TX.

ROT, Charcoal. **Macrophomina phaseoli**, CA, TX.

VIRUS. **Cowpea Aphid-Borne Mosaic**, Paraguay.

WILT. **Verticillium albo-atrum**, NM.

SESUVIUM

NEMATODE, Root Knot. **Meloidogyne** sp., AL, FL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia aristidae** (0, I), TX; II, III on grasses.

WHITE RUST. **Albugo trianthemi**, TX.

SHASTA DAISY (*Leucanthemum x Superbum*)

BACTERIAL Fasciation. **Clavibacter fascians**, CA.

LEAF BLOTCH. **Septoria leucanthemi**, CA, OR.

LEAF SPOT. **Cercospora chrysanthemi**, OK.

NEMATODE, Root Knot. **Meloidogyne** spp., AL, FL, MS.

ROT, Root. **Pythium** sp., NJ.

ROT, Stem. **Rhizoctonia solani**, MD; **Sclerotinia sclerotiorum**, MT, WA; **Fusarium roseum** and **F. solani**, TX.

SHEPHERD'S PURSE (*Capsella*)

BACTERIAL, Yellow. **Spiroplasma citri**, IL.

SHORTIA (*Oconee-bells*)

LEAF SPOT. **Peizizella oenotherae**, NC, SC.

SIDA

BLIGHT, Southern. **Sclerotium rolfsii**, FL.

CANKER, Stem. **Diaporthe phaseolorum** var. **caulivora**, LA.

LEAF SPOT. **Cercospora sidicola**; **Colletotrichum malvarum**, KS, TX, UT; **Phyllosticta spinosa**, KS, TX; **Ramularia sidarum**, FL; **Sclerotinia minor** (bleached leaf and stem lesions), NC.

NEMATODE, Root Knot. **Meloidogyne** spp., AL, FL, MS.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia heterospora**, FL to TX, IN, MO; **P. lobata**, AZ, CA, NM, TX, UT; **P. schedonnardi**, NM.

VIRUS. **Abutilon Mosaic**, FL.

SILENE (Catchfly, Cushion-Pink, Campion)

BROOMRAPE. **Orobanche ramosa**, TX.

DAMPING-OFF. **Rhizoctonia solani**, IL.

DOWNY MILDEW. **Peronospora silenes**, IL, KS, NE, TX, WI.

LEAF SPOT. **Ascochyta silenes**, MT, OK, WI; **Marssonina delastrei**, WI; **Phyllosticta nebulosa**, MT, NY, WI; **Septoria dimera**, NE, WI; **S. silenes**.

RUST. **Uromyces silenes** (0, I, II, III), CA, IA, KS, MT, PA, WA; **U. suksdorfii**, CA, ID, NM, UT, WA; **Puccinia aristidae** (0, I), AZ, TX.

SMUT, Flower. **Sorosporium saponariae**, CO, NV, UT; **Ustilago violacea**, anther smut, CA, MT, NH, TX, VA, WA, WY.

SKULLCAP (*Scutellaria*)

LEAF SPOT. **Cercospora scutellariae**, IL, MS, MO, TX; **Phyllosticta decidua**, TX, WI; **Septoria scutellariae**, ME to IA, CA, CO, MS, OK.

POWDERY MILDEW. **Erysiphe galeopsidis**, IL, IN, IA, KS, MI, NY, OH, WI; **Microsphaera** sp., IL.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, TX.

ROT, Stem. **Botrytis cinerea**, WA.

VIRUS. **Alternanthera Mosaic**, FL, MD, PA.

SKUNK-CABBAGE (*Symplocarpus*)

BLIGHT, Leaf. **Botrytis streptothrix**, CT, IL, NJ, NY.

LEAF SPOT. **Cercospora symplocarpi**, MA to VA, IN, WI; **Septoria spiculosa**, MD, NY, PA, WI.

SKUNK VINE (*Paederia foetida*)

LEAF SPOT. **Pseudocercospora paederiae**, FL.

SLENDERFLOWER THISTLE (*Carduus*)

RUST. **Puccinia carduorum**, CA.

SMALL FLOWER GALINSOGA (*Galinsoga parviflora*)

ROT, Stem. **Whetzelinia sclerotiorum**, MD.

SMELOWSKIA

RUST. **Puccinia aberrans** (0, III), CO, MT, NE, UT, WA; **P. holboellii**, NV; **P. monoica**, CO, WY.

SMILAX (Greenbrier Cat-Brier)

For Florists' Smilax, See Asparagus.

CANKER, Felt Fungus. **Septobasidium pseudopedicellatum**, FL.

GALL. **Synchytrium smilacis**.

LEAF SPOT. **Ascochyta confusa**, NY, WI; **Cercospora smilacina**, CT to FL, TX; **C. smilacis**, MA to FL, TX, and MN; **Colletotrichum smilacis**, IL; **Cylindrosporium smilacis**, AL; **Dothiorella smilacina**, MA to LA, TX; **Mycosphaerella smilacicola**, GA, SC; **Pestalotia clavata**, NY to AL, LA; **Phyllosticta subeffusa**, IL,

KS, WV; **Ramularia subrufa**, IA, MS, NE, WI; **Septogloeum subnudum**, IL, WI; **Septoria smilacis**, WV; **Sphaeropsis cruenta**, IA; **Stagonospora smilacis**, CT to MD, ND, TX.

NEMATODE, Burrowing. **Radopholus similis**, FL.

POWDERY MILDEW. **Phyllactinia corylea**, MI.

ROT, Root. **Helicobasidium purpureum**, TX.

RUST. **Puccinia amphigena** (0, I), KS, MI, NE, ND; II, III on *Calamovilfa*; **P. arundinariae** (0, I), NC, SC; **P. macrospora** (0, I), DE, NJ, NY; II, III on *Carex*; **P. smilacis** (II, III), MA to FL, TX, and NE; 0, I on *Apocynum*.

#### SMITHANTHA

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

SNAKEWEED (*Polygonum*)

NEMATODE, Foliar. **Aphelenchoides fragariae**, SC.

ROT, Root. **Pythium helicoides**, FL.

SOLOMONS SEAL, FALSE (*Maianthemum racemosum*)

LEAF SPOT. **Cercospora idahoensis**, ID; **Cylindrosporium smilacinae**, CA, CO, OR, UT; **Heterosporium asperatum**, WY; **Phloeospora vagnerae**, MT; **Ramularia smilacinae**, MT, WY, WA; **Septoria smilacinae**, general; **Sphaeropsis cruenta**, CA, NM; **Phytophthora ramorum**, CA.

ROT, Rhizome. **Stromatinia smilacinae**, NY.

RUST. **Puccinia sessilis**, CA, ID, IA, KS, ND, SD, MT, NE, NY, OK, PA, WA; **Uromyces acuminatus** var. **magnatus**, CO, IL, MN, MT, NE, ND, SD, WI; II, III on *Spartina*.

SMUT, Leaf. **Urocystis colchici**, MT.

#### SONCHUS

ROT. **Macrophomina phaseolina**, AZ.

VIRUS. **Sowthistle Yellow Vein**.

SOWTHISTLE, ANNUAL (*Sonchos oleraceus*)

RUST. **Miyagia pseudosphaeria**, CA.

VIRUS. **Iris Yellow Spot**, GA.

SPANISH MOSS (*Tillandsia*)

BLIGHT, Stem and Leaf. **Fusarium solani**. Southeast, U.S.

SPARAXIS (*Wandflower*)

VIRUS. **Iris Mosaic**, CA, OR.

#### SPATHIPHYLLUM

LEAF SPOT. **Myrothecium roridum**, FL.

NECROTIC LESIONS. **Pectobacterium carotovorum** subsp. **carotovorum**, Argentina.

SPIDER-LILY (*Hymenocallis*)

LEAF BLOTCH; Red Spot. **Stagonospora curtisii**, CA, TX.

LEAF SPOT. **Cercospora amaryllidis**, TX; **C. pancratii**, FL, LA, TX; **Gloeosporium hemerocallidis**, TX.

NEMATODE, Spiral. **Rotylenchus blaberus**.

VIRUS. **Mosaic**. Unidentified, CA.

SPIDERLING, WINE-FLOWER (*Boerhaavia*)

BACTERIAL Leaf Spot. **Xanthomonas campestris**, TX.

LEAF SPOT. **Ascochyta boerhaaviae**, TX; **Cercospora boerhaaviae**, TX.

NEMATODE, Root Knot. **Meloidogyne** spp.

ROT, Root. **Phymatotrichum omnivorum**, TX.

WHITE RUST. **Albugo platensis**, AZ, FL, NM, TX.

SPURGE CAPER (*Euphorbia lathyris*)

ROT, Root. **Macrophomina phaseolina**, AZ, **Rhizoctonia solani**, AZ; **Pythium aphanidermatum**, AZ.

SPURGE, CYPRESS (*Euphorbia cyparissias*)

ANTHRACNOSE. **Sphaceloma poinsettiae**, FL.

LEAF SPOT. **Cercospora euphorbiae**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia** sp.

RUST. **Melampsora euphorbiae** (0, I, II, III), ME to PA, IN, WI.

SPURGE LEAFY (*Euphorbia escula*)

LEAF SPOT; Blight. **Alternaria angustiovoidea**.

ROT, Crown and Root. **Fusarium oxysporum**; **F. solani**; **F. proliferatum**, MT.

SPURGE, PROSTRATE (*Euphorbia supina*)

CANKER, Girdling Stem; Gray Mold. **Amphobotrys ricini**, FL, LA, MD, MS, OK, TX.

SPURGE, SPOTTED (*Euphorbia maculata*)

NEMATODE, Root Knot. **Meloidogyne hapla**.

STACHYS (Betony, Hedgenettle, Woundwort)

GALL, Leaf. **Synchytrium stachydis**, LA.

LEAF SPOT. **Cercospora stachydis**, IA, ME; **Cylindrosporium stachydis**, IL;

**Ovularia bullata**, CA; **Phyllosticta decidua**, MA, WI; **P. palustris**, IL, OH;

**Ramularia stachydis**, OR; **Septoria stachydis**, CA, IL, MS, NY, WI.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Erysiphe galeopsidis** (*Golovinomyces cichoracearum*), OH to CO, MT, NY to IN, WI; **Sphaerotheca macularis**, CA.

RUST. **Puccinia pallidissima**, TX.

VIRUS. **Tomato Spotted Wilt**, GA.

STARFLOWER (*Trientalis*)

GALL, Leaf. **Synchytrium aureum**, PA.

LEAF SPOT. **Cylindrosporium magnusianum**, CA, MA, MI, NY, WI; **Septoria increscens**, CA, ME, MI, NY, VT, WI; **Phytophthora ramorum**, CA.

ROT, Leaf. **Ceratobasidium anceps**, WI.

RUST. **Puccinia caricina** var. **limosae** (0, I), AK, NY, WI; II, III on *Carex*.

SMUT, Leaf and Stem. **Tuburcinia trientalis**, OR, WA.

STARGRASS (*Aletris*)

LEAF SPOT. **Gloeosporium aletridis**, MS.

RUST. **Puccinia aletridis** (II, III), DE, FL, IL, IN, MA, MS, NJ, NC, RI, SC, TN,  
WI; 0, I unknown.

STENANTHIUM

RUST. **Puccinia atropuncta** (II, III), GA; **P. grumosa**, OR.

STEPHANOMERIA (Wire-Lettuce)

LEAF SPOT. **Cercospora clavicipa**, CA.

RUST. **Puccinia harknessii** (0, I, III), MT to NM, CA, WA.

STEVIA (*Piqueria*)

BACTERIAL Fasciation. **Clavibacter fascians**, MI.

BACTERIAL, MLO. **Aster Yellows**, MI, NJ.

DAMPING-OFF. **Rhizoctonia solani**, IL.

NEMATODE, Lesion. **Pratylenchus pratensis**, NJ.

POWDERY MILDEW. **Golovinomyces cichoracearum**, IL.

ROT, Stem. **Sclerotium rolfsii**, NJ.

WILT. **Verticillium dahliae**, CA.

STILLINGIA (Queens Delight)

DODDER. **Cuscuta** sp., OK.

LEAF SPOT. **Cercospora stillingiae**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Uromyces graminicola** (0, I), OK; II, III on *Panicum*.

STONE PLANT (*Lithops*)

ROT. **Fusarium oxysporum**, ID.

STREPTANTHERA

VIRUS. **Iris Mosaic**, CA, OR.

STREPTOPUS (Twisted-Stalk)

LEAF SPOT. **Cercospora streptopi**, WA; **Septoria streptopidis**, MT.

RUST. **Puccinia sessilis** (0, I), NY.

SMUT, Leaf. **Tuburcinia clintoniae**, WI.

VIRUS. **Mosaic**, AK.

STROPHOSTYLES (Wild Bean)

VIRUS. **Alfalfa Mosaic**, AR; **Chlorotic Mottle**, AR; **Cowpea Chlorotic Mottle**,  
AR; **Quail Pea Mosaic**, AR; **Soybean Mosaic**, AR.

STYLOSANTHES

LEAF SPOT, Canker. **Colletotrichum dematium** f. sp. **truncata**, FL.



SUNFLOWER (*Helianthus*)

ANTHRACNOSE. *Colletotrichum acutatum*, CA.

BACTERIAL Leaf Spot. *Pseudomonas syringae* pv. *helianthi*; *P. syringae* pv. *tagetis*, WI.

BACTERIAL, MLO. *California Aster Yellows*, CA.

BACTERIAL Stem Rot. *Erwinia carotovora*, ND.

BACTERIAL Wilt and Apical Chlorosis. *Pseudomonas solanacearum*, FL; *P. syringae* pv. *tagetis*, KS, MN, ND, WI; *Erwinia carotovora* pv. *carotovora*, IN.

BLACK KNOT, Black Patch. *Gibberidea heliopsisidis*, GA, IL, MS, MO, NC, VA.

BLIGHT, Gray Mold; Bud Rot. *Botrytis cinerea*, CA, OR.

BLIGHT, Petal. *Itersonilia perplexans*, FL.

BLIGHT, Seedling. *Alternaria helianthi*, MN; *Diaporthe helianthi*, TX.

BLIGHT, Southern. *Sclerotium rolfsii*, LA, TX.

CANKER, Stem. *Diaporthe helianthi*, OH, TX; *Phomopsis helianthi*, IL.

DODDER. *Cuscuta* sp., OK, TX, WA.

DOWNY MILDEW. *Plasmopara halstedii*, NY to MD, KS, MT, TX.

GALL, Basal. *Plasmopara halstedii*, MN, ND.

LEAF SPOT. *Ascochyta compositarum*, WI; *Cercospora helianthi*, IL, KS, MO, OH, TX, WI; *C. pachypus*, AL, KS, OK, TX; *Colletotrichum helianthi*, WI; *Septoria helianthi*, general; *Alternaria zinniae*; *Alternaria helianthi*, MN, OH.

NEMATODE, Leaf Gall. *Tylenchus balsamophilus*, WA.

NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL, TX, WV.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general, CA.

ROT, Charcoal. *Macrophomina phaseolina*, CA, IL, MD, MN, ND, SD.

ROT, Head. *Rhizopus oryzae*, CA, NM; *Phoma macdonaldii*, premature ripening, ND.

ROT, Root. *Armillaria mellea*, OR; *Helicobasidium purpureum*, violet root, TX; *Phymatotrichum omnivorum*, TX; *Pythium debaryanum*; *Rhizoctonia solani*, IL, MD, NE, NY, WI.

ROT, Stem. *Phytophthora cryptogea*, CA; *Septosphaeria lindquistii*, black stem, MN, ND; *Sclerotinia sclerotiorum*, widespread.

RUST. *Puccinia helianthi*, (0, I, II, III), general, CA, IL, MN, NE, ND; *P. massalis*, NM, TX; *P. canaliculata*, GA, KS; *P. xanthii*, ND; *Coleosporium helianthi* (II, III), NY to FL, LA and OK; II, III on pine; *C. madaiae*, CA; *Uromyces junci* (0, I), CA, KS, NE, ND, OK, SD, WY; *U. silphii* (0, I), IL, MO, NY, TN, WI.

SMUT, Leaf. *Entyloma polysporum* CA, MT.

VIRUS. *Bromegrass Mosaic* General, IA, SD; *Sunflower Mosaic*, IN, TX; *Cucumber Mosaic*, FL, MD; *Bidens Mottle*, FL.

WHITE RUST. *Albugo tragopogonis*, CO, IL, KS, MO, WI.

WILT. *Fusarium oxysporum* f. sp. *apii*, SC; *F. sporotrichioides*, MN; *Verticillium albo-atrum*; *V. dahliae*, CA; *Sclerotinia sclerotiorum* = *Whetzelinia sclerotiorum*, CA.

SUNROSE (*Helianthemum*)

LEAF SPOT. *Cylindrosporium eminens*, TX, WI; *Septoria chamaecisti*, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

SWEDISH IVY (*Plectranthus australis*)

NONPARASITIC. **Brown Leaf Spot.** Boron deficiency.

VIRUS. **Alfalfa Mosaic**, NY; **Tomato Spotted Wilt**, PA; and **TSW-Impatiens Serotype**, GA, FL.

SWEET-FLAG (*Acorus*)

LEAF SPOT. **Cylindrosporium acori**, CT, KS; **Ramularia aromatica**, CT to MD, IN, WI; **Septocylindrium** sp., NY.

RUST. **Uromyces sparganii** (II, III), ME to VA, IL, MN, MS; 0, I unknown.

SWEET-ROOT (*Osmorhiza*)

LEAF GALL. **Urophlyctis (Physoderma) pluriannulata**, MT.

LEAF SPOT. **Cercospora osmorhizae**, IL, OH, WI; **Fusicladium angelicae**, WA; **Phloeospora osmorhizae**, IA, NY, WI; **Ramularia reticulata**, WI, VA; **Septoria aegopodii**, NY, ND, OH, WI.

RUST. **Puccinia pimpinallae** (0, I, II, III), general.

SWEET VETCH (*Hedysarum*)

BLACK MILDEW. **Parodiella perisporioides**, NY.

LEAF SPOT. **Septogloeum hedysari**, WY.

NEMATODE, Root Knot. **Meloidogyne** sp.

RUST. **Uromyces hedysari-obscuri** (0, I, II, III), AK, CO, ID, MT, NM, SD, UT, WY.

SWINE CRESS (*Coronopus*)

ROT. **Sclerotinia minor**. NC.

## SYNTHYRIS

LEAF SPOT. **Ramularia** sp., OR.

RUST. **Puccinia acrophila** (III), MT to CO, UT; **P. welfeniae** (III), CA, ID, OR, WA, WY.

# T

## TAENIDIA

LEAF SPOT. **Fusicladium angelicae**, WI; **Septoria pimpinellae**, MN.

RUST. **Puccinia angelicae** (0, I, II, III), IN, MI, MO, NY, WI.

## TAHITIAN BRIDAL VEIL (*Gibasis*)

VIRUS. **Bean Yellow Mosaic**, VA.

## TANSY (*Tanacetum*)

LEAF SPOT. **Ramularia tanacetii**, WI.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA.

RUST. **Puccinia tanacetii** (0, I, II, III), WY; 0, I, II, III on **Artemisia**; II on chrysanthemum.

## TEASEL (*Dipsacus*)

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

DOWNY MILDEW. **Peronospora dipsaci**, MO.

LEAF SPOT. **Cercospora elongata**, MD, NY to MO, WA.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, CA, OR.

POWDERY MILDEW. **Phyllactinia corylea**, WA; **Sphaerotheca dipsacearum**, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, TX.

VIRUS. **Teasel Mosaic**.

## TELLIMA

POWDERY MILDEW. **Sphaerotheca macularis**, AK.

RUST. **Puccinia heucherae** (III), AK, CA, OR, WA.

## TEXASWEED (*Caperonia*)

CANKER, Stem. **Amphobotrys ricini**, TX.

THISTLE (*Cirsium*)

LEAF SPOT. **Cercospora** spp., WA, KS, TX; **Phyllosticta cirsii**, NY, WA, WI; **Stagonospora cirsii**, WI; **Septoria cirsii**, VT to IN, TX, WI; **Alternaria chrysanthemi**, MT.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general; **Phyllactinia corylea**, WA; **Sphaerotheca macularis**, MD.

ROT, Root. **Rhizoctonia solani**, IL; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia cirsii** (0, I, II, III), PA to NC, CA, OR, TX; **P. punctiformis** (0, I, II, III), ME to NJ, CA, OH, WA; **Uromyces junci** (0, I), MO, NE, ND.

SMUT, Inflorescence. **Thecaphora trailii**, CO, UT.

WHITE RUST. **Albugo tragopogonis**, NY to IA, LA, TX, WY.

THISTLE, BLESSED (*Cnicus*)

BLIGHT, Southern. **Sclerotium rolfsii**, GA.

THISTLE, CREEPING (“Canada”) (*Cirsium arvense*)

POWDERY MILDEW. **Golovinomyces cichoracearum**, ID, OR.

THISTLE MUSK (*Carduus thoermeri*)

RUST. **Puccinia carduorum**, CA, MO, NV, OK, VA.

## THLASPI

LEAF SPOT. **Alternaria brassicicola**, NY.

THOROUGHWAX (*Bupleurum*)

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

## THUNBERGIA (Clockvine)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CT, FL.

BACTERIAL, MLO. **Aster Yellows**, NY.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

VIRUS. **Broad Bean Wilt**, NY.

## TIDESTROMIA

ROT. **Macrophomina phaseolina**, AZ.

## TRAUTVETTERIA (False Bugbane)

DOWNY MILDEW. **Peronospora ficariae**, TN.

LEAF SPOT. **Septoria trautveteriae**, WV.

RUST. **Puccinia pulsatillae**, ID, OR, WA.

SMUT, Leaf and Stem. **Urocystis anemones**, UT.

## TRILLIUM (Wake-Robin)

BLIGHT, Leaf. **Ciborinia trillii**.

BLIGHT, Tuber Storage Rot. **Sclerotinia sclerotiorum**, LA.

LEAF SPOT. **Colletotrichum peckii**, NY to NC, IL, MN; **Gloeosporium trillii**, CA, OR, WA; **Heterosporium trillii**, WA; **Phyllosticta trillii**, NY, PA, WA, WI;

**Septoria trillii**, New England to OK, SC, WI.

ROT, Stem. **Sclerotium rolfsii**, NH, PA.

RUST. **Uromyces halstedii** (0, I), IL, NY; II, III on *Spartina*.

SMUT, Leaf. **Urocystis trillii**, ID, OR.

TULIP (*Tulipa*)

ANTHRACNOSE. **Gloeosporium thuemenii** f. sp. **tulipi**, CA.

BACTERIAL Soft Rot. **Erwinia carotovora**, WA.

BLIGHT, Botrytis; Tulip Fire. **Botrytis tulipae**, general except for South and Southwest; **B. cinerea**, sometimes secondary.

BLIGHT, Southern; Bulb and Stem Rot. **Sclerotium rolfsii**, CA, CT, NY, OR.

NEMATODE, Bulb. **Ditylenchus dipsaci**, NY.

NONPARASITIC. **Chalking**, stone disease. Immaturity of bulbs or injury at digging.

**Topple**, Sugarstem. Collapse of flower stem, often from calcium deficiency.

ROT, Basal. **Fusarium** sp., OK, WA.

ROT, Black. **Sclerotinia sclerotiorum**, WA.

ROT, Bulb. **Penicillium** spp., blue mold; **Aspergillus** spp., black mold, cosmopolitan; **Rhizopus stolonifer**, mushy rot, cosmopolitan; **Sclerotinia** sp., ME, OH, WA; **S. sativa**, MD, NY; **Pythium ultimum**, secondary.

ROT, Gray Bulb. **Rhizoctonia tuliparum**, Northeast, Pacific states.

ROT, Root, Stem, Bulb. **Rhizoctonia solani**, MA, NY, WA.

ROT, Stem; Flower Spot. **Phytophthora cactorum**, CA, IA, NJ, PA, SC, WA.

VIRUS. **Tulip Breaking** (Lily Latent Mosaic and Tulip Color-adding), general; **Tobacco Necrosis**, WI.

Botrytis blight is extensive with tulips. In a wet spring, leaves are blasted, buds blighted, and open flowers covered with spots, followed by the familiar gray mold. Sanitary measures are all-important, for the sclerotia survive in the soil, ready to blight new, healthy bulbs. Cut off fading flowers into a paper bag. Gradual running out of tulips may be due to virus disease. Breaking of flowers, once considered a desirable ornamental character, is now recognized as a disease that may be harmful in the long run. Unless aphids are controlled, the virus will spread from variegated to solid-color plantings in the garden.

# U

UMBRELLAWORT (*Oxybaphus*)

DOWNY MILDEW. **Peronospora oxybaphi**, KS, SD.

LEAF SPOT. **Ascochyta oxybaphi**, IA, WI; **Cercospora oxybaphi**, IL, IA, KS, NE, OH, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

WHITE RUST. **Albugo platensis**, AL.

UVULARIA (Bellwort, Merry-Bells)

LEAF SPOT. **Sphaeropsis cruenta**, CT, IL, IN, IA, MO, NY, VA, WI.

RUST. **Puccinia sessilis** (0, I), DE, IA, MN, MO, NY, ND, WI; **Uromyces acuminatus** var. **magnatus** (0, I), MS, WI.

# V

## VANILLA

BLACK MILDEW. **Lembosia rolfsii**, FL.

LEAF SPOT; Pod Spot. **Botryosphaeria vanillae**, FL; **Volutella vanillae**, FL.

## VANILLA-LEAF (*Achlys*)

LEAF SPOT. **Ascochyta achlyicola**, WA; **Stagonospora achlydis**, OR.

## VENUS FLYTRAP (*Dionaea muscipula*)

ROT, Root. **Phytophthora cinnamomi**, NC.

## VERATRUM (False-Hellebore)

LEAF SPOT. **Ascochyta veratrina**, WA; **Cylindrosporium veratrinum**, CA, NY, UT, VA, WA; **Cercospora terminalis**, NY; **Phyllosticta melanoplaca**, CA, CT, ID, UT.

LEAF SPOT, Tar. **Phyllachora melanoplaca**, NY.

RUST. **Puccinia atropuncta** (II, III), MO, NC, OK, TN, VA, WV; 0, I on composites; **P. veratri**, widespread; 0, I on *Epilobium*.

## VERBASCUM

BACTERIAL, Proliferation. **Rhodococcus fascians**, OR.

## VERBENA (Native Species)

BLIGHT, Web. **Rhizoctonia solani**, LA.

BREAK CARMOVIRUS.

BROOMRAPE. **Orobanche ramosa**, TX.

DODDER. **Cuscuta arvensis**, OK.

DOWNY MILDEW. **Plasmopara halstedii**, NM.

LEAF SPOT. **Ascochyta verbenae**, WI; **Cercospora verbenicola**, AL, LA, TX; **Phyllosticta texensis**, TX; **Septoria verbenae**, VT to MS, SD, TX.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia aristidae** (0, I), AZ; II, III on grasses; **P. vilfae** (0, I), IN to OK, SD; II, III on *Sporobolus*.

VIRUS. **Bean Yellow Mosaic**, CA; **Bidens Mottle**, FL; **Clover Yellow Mosaic**, FL; **Tomato Spotted Wilt**, GA; **Nemesia Ring Necrosis Tymovirus**, CA; **Angelonia Flower Break Carmovirus**.

VERBENA (*Nemesia diascia*)

NEMESIA RING NECROSIS. **Tymovirus**, CA; **Angelonia Flower Break Carmovirus**.

VERBESINA (Crownbeard)

DOWNY MILDEW. **Plasmopara halstedii**, NM, TX.

LEAF SPOT. **Cercospora fulvella**, TX; **Colletotrichum** sp., also stem spot; **Phyllosticta verbessinae**, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., AL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, SC, TX, VA.

ROT, Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium viguierae** (II, III), AZ, FL, NC, TX; 0, I unknown; **Puccinia abrupta** (II, III), CA, TX; **P. cognata** (0, I, II, III), AR, LA, TN, TX; **P. verbessinae** (0, I, II, III), MD to AL, LA.

VETCH (*Vicia*)

BLIGHT, LEAF. **Ascochyta fabae** f. sp. **vicia**, CT.

LEAF SPOT. **Ramularia sphaeroidea** (also stem), CA.

LEAF SPOT, Chocolate. **Botrytis fabae**, CT.

NEMATODE, Ring. **Mesocriconema** (formerly **Criconemella**), SC.

VIRUS. **Broad Bean Severe Chlorosis**, MI; **Broad Bean Wilt**.

VINCETOXICUM (Milkvine)

DOWNY MILDEW. **Plasmopara gonolobi**, MD to FL, TX.

LEAF SPOT. **Cercospora bellynckii**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia obliqua** (III), FL to KY, AZ, OK; **Uromyces asclepiadis** (II, III), IN, WV.

VIOLET (*Viola odorata* and *Native Species*)

ANTHRACNOSE. **Colletotrichum violae-tricoloris**, CT, MA, MS, NJ, NY, OH, PA.

BLIGHT, Southern. **Sclerotium rolfsii**, VA to FL, CA, CT, NY, TX, VT.

DOWNY MILDEW. **Bremiella megasperma**, FL, IL, IA, MN, NJ.

GALL, Leaf. **Synchytrium aureum**, NY, WI.

LEAF SPOT. **Alternaria violae**, CT to GA, TX, WI; **Ascochyta violicola**, AK; **A. violae**, IN, IA, PA, WI; **Centrospora acerina**, AK, CA; **Cercospora granuliformis**, ME to AL, OK, SD; **C. violae**, MA to FL, ND, TX; **Cryptostictis violae**, IL; **Cylindrosporium violae**, MT; **Heterosporium** sp., AK; **Marssonina violae**, MA to SC, IA, MN; **Phyllosticta violae**, MA to FL, CA, KS, MN; **P. nigrescens**, CA; **Ramularia lactea**, AK, CO, MS, MT; **R. agrestis**, NE, OR; **Septoria violae**, northeastern and North central states to AK, FL, KS, LA; **Ciborinia violae**.

NEMATODE, Lesion. **Pratylenchus pratensis**.

NEMATODE, Root Knot. **Meloidogyne** spp., FL to CA, occasional in North.



POWDERY MILDEW. **Sphaerotheca macularis**, CA, CO, ND, OR, WI, WY.  
 ROT, Root. **Fusarium oxysporum** f. sp. **aurantiacum**, FL, MS, OH; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, FL, IL, MN, MS, NY; **Thielaviopsis basicola**, CT to MS, KS, MA, OH.  
 ROT, Wet; Gray Mold. **Botrytis cinerea**, AK, MD, OH.  
 RUST. **Puccinia violae** (0, I, II, III), general; **P. effusa** (III), CA; **P. ellisiana** (0, I), northeastern and North central states to AL, NM, WY; II, III on *Andropogon*; **P. fergussoni** (III), AK, CO, MT, UT; **Uromyces andropogonis**, (0, I), MS, NJ, NC, PA, TN, WV; II, III on *Andropogon*.  
 SMUT, Leaf and Stem. **Urocystis violae**, AK, CA, MN, TX, UT.  
 SOOTY MOLD. **Scorias spongiosa**, ME.  
 SPOT ANTHRACNOSE; Scab. **Sphaceloma violae**, ME to FL, KS, LA, OH, WA.  
 VIRUS. **Beet Curly Top**, TX.

Spot anthracnose is an important violet disease in many gardens with disfiguring scabby lesions on stems and leaves.

VIPERS-BUGLOSS (*Echium*)

LEAF SPOT. **Cercospora echii**; **Stemphylium** sp., NY.

ROT, Root. **Rosellinia** sp., CA.

ROT, Stem. **Sclerotinia sclerotiorum**, ND.

# W

WATER-CRESS (*Nasturtium Officinale*)

DAMPING-OFF. **Rhizoctonia solani**, TX.

LEAF SPOT. **Cercospora nasturtii**, CA, CT, FL, IN, NH, TX, WI.

ROT, Root. **Pythium debaryanum**, TX; **Sporgospora subterranea** f. sp. **nasturtii**, FL, PA; **Phytophthora cryptogea**, and stem, FL.

RUST. **Puccinia aristidae**, AZ, CO, TX.

VIRUS. **Western Aster Yellows Phytoplasma**, HI.

VIRUS, Mosaic and Stunting. **Turnip Virus**, Brazil.

WHITE RUST; White Blister. **Albugo candida**, MN.

WATER-HOREHOUND (*Lycopus*)

GALL, Leaf. **Synchytrium cellulare**, WI.

LEAF SPOT. **Ascochyta lophanthi**, MA, WI; **Cercospora lycopi**, LA; **Phyllosticta deciduala**, IA, OK, WI; **Septoria lycopi**, WI.

RUST. **Puccinia angustata** (0, I), ME to MD, KS, ND; II, III on grasses.

WATER-HYACINTHS (*Eichhornia*)

BLIGHT. **Aquathanatephorus pendulus** (*Rhizoctonia* stage), LA.

LEAF SPOT. **Cercospora piaropi**, FL.

ROT, Root and Crown. **Mycoleptodiscus terrestris**, FL.

WATER-LILY (*Nymphaea*)

LEAF SPOT. **Alternaria** sp., TX; **Cercospora exotica**, IL; **C. nymphaeacea**, scattered ME to TX, CA; **Helicoceras nymphaerum**, MD, NJ, NY; **Mycosphaerella pontederiae**, MI, VA; **Ovularia nymphaearum**, MD, NY, WA; **Phyllosticta fatiscens**, VT; **Dichotomophthoropsis nymphaerum**, MN; **Sclerotium** sp., MN.

ROT, Leaf and Stem. **Pythium** spp., MA, NY, WI.

SMUT, White. **Entyloma nymphaeae**, MA to VA, OK, WI.

WATER-LILY, YELLOW POND-LILY (*Nuphar*)

LEAF SPOT. **Dichotomophthoropsis nymphaerum**, MN.

LEAF SPOT. **Mycosphaerella pontederiae**, ME, MI, NY, VA, WI; **Phyllosticta fatiscens**, IA, NJ, NY, WI.

SMUT, White. **Entyloma nymphaeae**, CT, IL, MA, WI.

WATER-PRIMROSE (*Jussiaea*)

LEAF SPOT. **Alternaria** sp. OK; **Cercospora jussiaeae**, AL, OK, TX; **Colletotrichum jussiaeae** AL, TX; **Septoria jussiaeae** AL, FL, LA, TX.

RUST. **Aecidium betheli**, CA; **Puccinia jussiaeae** (0, I, III), MS; **Uredo guaunabensis** (II), FL.

WATER SHIELD (*Brasenia*)

LEAF SPOT. **Dichotomophthoropsis nymphaearum**, MN.

WATSONIA

ROT, Root. **Armillaria mellea**, CA.

VIRUS. **Iris Mosaic**, CA.

WILD GARLIC (*Allium vineale*);

WILD MUSTARD (*Brassica kaber*)

WILT, Water-soaked foliage. **Sclerotinia minor**, NC.

WINTER CRESS (*Barbarea*)

BACTERIAL Black Rot. **Xanthomonas barbareae**, NY.

BACTERIAL, Yellow. **Spiroplasma citri**, IL.

DODDER. **Cuscuta gronovii**, NY.

DOWNY MILDEW. **Peronospora parasitica**, TX.

LEAF SPOT. **Cercospora barbarea**, WI; **Ramularia barbareae**, MA to NJ, OH, TX, WI; **Alternaria** sp., PA.

ROT, Stem. **Sclerotium rolfsii**, TX.

VIRUS. **Beet Curly Top**; **Potato Yellow Dwarf**.

WHITE RUST. **Albugo candida**, CA, TX.

WOOD-BETONY, LOUSEWORT (*Pedicularis*)

GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Ramularia obducens**, CA; **Septoria cylindrospora**, WI.

POWDERY MILDEW. **Sphaerotheca macularis**, CA, CO, MD, MI, MN, WY, WI.

RUST. **Cronartium coleosporioides** (II, III), CA, ID, MT, NM, WA; **Puccinia clintonii** (III), CO, ID, ME, MI, NM, NY, OR, WA, WI, WY; **P. rufescens** (I, III), CA, CO, NV.

WOODRUSH (*Luzula*)

RUST. **Puccinia obscura** (II, III), ME to KS, ID, OR, WA, WI.

SMUT. Inflorescence. **Cintractia luzulae**, IN.

WYETHIA

LEAF SPOT. **Didymaria conferta**, OR, UT; **Marssonina wyethiae**, CA, WA; **Septoria wyethiae**, CA, UT.

NEMATODE, Leaf Gall. **Tylenchus balsamophilus**, UT.

RUST. **Puccinia balsamorhizae** (0, I, II, III), AZ, CA, CO, UT.

# X

## XANTHOSOMA

ROT, Root. **Armillaria mellea**, CA; **Fusarium solani**, powdery gray rot, FL.

XEROPHYLLUM (Turkeybeard)

RUST. **Puccinia atropuncta** (II, III), MS.

# Y

YELLOW-ROOT (*Xanthorhiza*)

LEAF SPOT. **Phyllosticta xanthorhizae**, NC, WV.

YERBA BUENA (*Micromeria*)

RUST. **Puccinia menthae** (0, I, II, III), CA, ID, OR, WA.

# Z

## ZIGADENUS

RUST. **Puccinia atropuncta** (II, III), IA, MO, ND, TX, WI; 0, I on composites;

**P. grumosa** (0, I, II, III), CO, MT, WY; **Uromyces zygadeni** (0, I, II, III), CA, CO IA, KS, MT, NV, TX, UT, WA, WY.

SMUT, Leaf. **Urocystis flowersii**, UT.

## ZIZIA (Meadow Parsnip)

GALL, Leaf. **Urophlyctis** (*Physoderma*) **pluriannulata**, IA, WI.

LEAF SPOT. **Ascochyta thaspii**, WI; **Cercospora ziziae**, PA, WI; **Cylindrosporium ziziae**, ND, WA, WI; **Septoria ziziae**, ND.

POWDERY MILDEW. **Erysiphe polygoni**, PA, WV.

RUST. **Puccinia ziziae** (III), WA.

## Part V

# List of Land-Grant Institutions and Agricultural Experiment Stations in the United States

For help in diagnosing and controlling plant diseases contact your County Ag Commissioners (CA) or county extension agent, your state Diagnostic Lab, your state Department of Agriculture or your Cooperative Extension Specialist.

Alabama: Auburn University, Auburn, AL 36849. <http://www.aces.edu/dept/plantdia-gnosticlab/>

Alabama Cooperative Extension Service <http://www.aces.edu/plantlabbbham/>

Alaska: University of Alaska and Alaska Department of Agriculture <http://www.dnr.state.ak.us/ag/index.htm>

Arizona: University of Arizona, Tucson, AZ 85721. <http://ag.arizona.edu/PLP/plpext/>

Arkansas: University of Arkansas, Fayetteville, AR 72701. <http://www.aragriculture.org/pestmanagement/diseases/clinic/default.asp>

California: Department of Food and Agriculture, Plant Pest Diagnostic Center. (sgaimari@cdfa.ca.gov)

Colorado: Colorado State University, Fort Collins, CO 80523. <http://www.coopext.colostate.edu/jeffco/hort/clinic.htm>

Connecticut: University of Connecticut, Storrs, CT 06269. (<http://pronewengland.org>)

Delaware: University of Delaware, Newark, DE 19716. <http://ag.udel.edu/extension/pdc/index.htm>

District of Columbia: See Rutgers. <http://www.rcs.rutgers.eon/services/>

Florida: University of Florida, Gainesville, FL 32611. <http://plantpath.ifas.ufl.edu/>

Georgia: University of Georgia, Athens, GA 30602. <http://www.plant.uga.edu/Extension/Clinics/PDC.htm>

Hawaii: University of Hawaii, Honolulu, HI 96822. <http://www2.ctahr.hawaii.edu/adsc/>

Idaho: University of Idaho, Extension Service, Parma, ID 83660. <http://www.uidaho.edu/ag/plantdisease/>

Illinois: University of Illinois, Urbana, IL 61802. <http://plantclinic.cropsci.uiuc.edu/>

Indiana: Purdue University, West Lafayette, IN 47907. <http://www.ppd.l.purdue.edu>

Iowa: Iowa State University, Ames, IA 50011. <http://www.isuplantdiseaseclinic.org>



- Kansas: Kansas State University, Manhattan, KS 66506. <http://www.plantpath.k-state.edu/DesktopDefault.aspx?tabid=49>
- Kentucky: University of Kentucky, Lexington, KY 40546. [http://www.ca.uky.edu/agcollee/plantpathology/extension/pdd\\_lab.html](http://www.ca.uky.edu/agcollee/plantpathology/extension/pdd_lab.html)
- Louisiana: Louisiana State University, Baton Rouge, LA 70803. [http://www.lsuagcenter.com/en/our\\_offices/departments/PlantPathology\\_Crops\\_Physiology/Plant\\_Disease\\_Clinic/](http://www.lsuagcenter.com/en/our_offices/departments/PlantPathology_Crops_Physiology/Plant_Disease_Clinic/)
- Maine: University of Maine, Orono, ME 04473. <http://pmo.umext.main.edu>
- Maryland: University of Maryland, College Park, MD 20742. <http://www.plantclinic.umd.edu/>
- Massachusetts: University of Massachusetts, Amherst, MA 01003. ([umassexextension.org](http://umassexextension.org))
- Michigan: Michigan State University, East Lansing, MI 48824. <http://www.pestid.msu.edu/>
- Minnesota: University of Minnesota, St. Paul, MN 55108. <http://www.extension.umn.edu/distribution/cropssystem/DC3170.html>
- Mississippi: Mississippi Cooperative Extension Service, Mississippi State University, MS 39762. <http://www.extensionplantclinics.msstate.edu/>
- Missouri: University of Missouri, Columbia, MO 65211. <http://soilplantlab.missouri.edu/>
- Montana: Montana State University, Bozeman, MT 59717. <http://scarab.msu.montana.edu/jpm/>
- Nebraska: University of Nebraska, Lincoln, NE 68583. <http://plantpath.unl.edu/ppathdiagnostic.htm>
- Nevada: University of Nevada, or Nevada Department of Agriculture. <http://www.nevada.gov/>
- New Hampshire: University of New Hampshire, Durham, NH 03824. <http://ceinfo.unh.edu/Agric/AGPDTS/PlantH.htm>
- New Jersey: Rutgers, The State University, Milltown, NJ 08850. <http://www.rce.rutgers.edu/services/>
- New Mexico: New Mexico State University, Las Cruces, NM 88003. <http://plantclinic.nmsu.edu>
- New York: Cornell University, Ithaca, NY 14853. <http://plantclinic.cornell.edu>
- North Carolina: North Carolina State University, Raleigh, NC 27695. <http://www.ncsu.edu/pdic>
- North Dakota: North Dakota State University, Fargo, ND 58105. <http://www.ag.ndsu.nodak.edu/diaglab/>
- Ohio: Ohio State University, Columbus, OH 43210. <http://ppdc.osu.edu>
- Oklahoma: Oklahoma State University, Stillwater, OK 74078. <http://entopl.okstate.edu/Pddl/>
- Oregon: Oregon State University, Corvallis, OR 97331. [http://web.science.oregonstate.edu/bpp/Plant\\_Clinic/index.htm](http://web.science.oregonstate.edu/bpp/Plant_Clinic/index.htm)
- Pennsylvania: The Pennsylvania State University, University Park, PA 16802. <http://www.ppath.cas.psu.edu/extension.html>

- Puerto Rico: Department of Agriculture, San Juan, PR. <http://www.agricultura.gobierno.pr>
- Rhode Island: University of Rhode Island, Kingston, RI 02881. <http://www.uri.edu/ce/ceec/plantclinic.html>
- South Carolina: Clemson University, Clemson, SC 29634. <http://www.clemson.edu/agrvlb>
- South Dakota: South Dakota State University, Brookings, SD 57007. <http://plantsci.sdstate.edu/planthealth/subpage.cfm?ID=12>
- Tennessee: University of Tennessee, Nashville, TN 37211. <http://soilplantandpest.utk.edu/>
- Texas: Texas A & M University, College Station, TX 77845. <http://plantdiseaselab.tamu.edu/>
- Utah: Utah State University, Logan, UT 84322. <http://utahpests.usu.edu>
- Vermont: University of Vermont, Burlington, VT 05405. <http://pss.uvm.edu/pd/pdc/>
- Virgin Islands: Virgin Islands Extension Service, Kingshill, St. Croix, VI 00850. <http://rps.uvi.edu/CES/index.html>
- Virginia: Virginia Polytechnic Institute, Blacksburg, VA 24061. <http://www.ppws.vt.edu/~clinic/>
- Washington: WSU Research and Extension Center, Puyallup, WA 98371. <http://www.puyallup.wsu.edu/plantclinic/index.html>
- West Virginia: West Virginia University Extension Service, Morgantown, WV 26506. <http://www.mastergardener2008.com/>
- Wisconsin: University of Wisconsin, Madison, WI 53706. <http://pddc.wisc.edu/>, <http://www.entomology.wisc.edu/entodiag.html>
- Wyoming: University of Wyoming Cooperative Extension Service, Laramie, WY 82071. <http://ces.uwyo.edu/>
- Ontario: Pest Diagnostic Clinic, University of Guelph, Ontario, Canada, N1H 8J7. <http://www.labservices.uoguelph.ca/units/pdc/>

# Glossary

- Acervulus*, pl. *Acervuli*. A “little heap,” an erumpent, cushionlike mass of hyphae bearing conidiophores and conidia, sometimes with setae; characteristic of the Melanconiales.
- Acicular* Needlelike
- Aeciospore* Rust spore formed in an aecium.
- Aecium*, pl. *Aecia*. A cluster-cup, or cuplike fruiting sorus in the rusts.
- Aerobic*. Living or active only in the presence of oxygen.
- Amoeboid* Not having a cell wall and changing in form like an amoeba.
- Allantoid* Sausage-shaped.
- Alternate Host* One or other of the two unlike hosts of a heteroecious rust.
- Anamorph* State of life-cycle in which asexual spores, or none, are produced.
- Annulus* A ring; ringlike partial veil around stipe in the mushrooms.
- Antheridium*, pl. *Antheridia* Male sex organ in the fungi.
- Anthraxnose* A disease with limited necrotic lesions, caused by a fungus producing nonsexual spores in acervuli.
- Antibiotic* Damaging to life; especially a substance produced by one microorganism to destroy others.
- Apothecium*, pl. *Apothecia* The cup- or saucer-like ascus-bearing fruiting body; in the Discomycete section of the Ascomycetes.
- Appressorium* A swelling on a fungus germ tube for attachment to host in early stage of infection; found especially in anthracnose fungi and rusts.
- Ascocarp*, or *Ascoma* Any structure producing asci, as an apothecium, perithecium.
- Ascomycetes* One of the three main groups of the fungi, bearing sexual spores in asci.
- Ascospore* Produced in ascus by free cell formation.
- Ascus*, pl. *Asci* Saclike, usually clavate cell containing ascospores, typically eight.
- Aseptate* Without cross-walls.
- Asexual* Vegetative, having no sex organs or sex spores; the imperfect stage of a fungus.
- Autoecious* Completing life cycle on one host; term used in rusts.

- Bacteria* Microscopic one-celled organisms increasing by fission.
- Bactericide* Substance causing death of bacteria.
- Basidiomycetes* Class 3 in the Fungi, characterized by septate mycelium, sometimes with clamp-connections, and sexual spores on basidia.
- Basidiospore* Spore produced on a basidium.
- Basidium*, pl. *Basidia* Club-shaped structure, which, after fusion of two nuclei, produces four basidiospores.
- Binucleate* Having two nuclei.
- Blight* A disease with sudden, severe leaf damage and often with general killing of flowers and stems.
- Blotch* A blot or spot, usually superficial.
- Breaking*, of a virus Loss of flower color in a variegated pattern, especially in tulips.
- Canker* A lesion on a stem; a plant disease with sharply limited necrosis of the cortical tissue.
- Carrier* Infected plant showing no marked symptoms but source of infection for other plants.
- Catenulate* In chains, or in an end-to-end series.
- Cerebroid* With brainlike convolutions or folds.
- Chemotherapy* Treatment of internal disease by chemical agents that have a toxic effect on the microorganism without injuring the plant.
- Chlamydospore* Thick-walled, asexual resting spore formed by the rounding up of any mycelial cell; also used for smut spores.
- Chlorosis* Yellowing of normally green tissue due to partial failure of chlorophyll to develop; often due to unavailability of iron.
- Cilium*, pl. *Cilia* Hairlike swimming organ on bacteria or zoospores.
- Cirrus*, pl. *Cirri* A tendril or horn of forced-out spores.
- Clamp-connections* Outgrowths of hyphae which form bridges around septa, thus connecting two cells; in Basidiomycetes.
- Clavate* Club-shaped.
- Cleistothecium*, pl. *Cleistothecia* A perithecium without a special opening; in powdery mildews.
- Coalesce* Growing together into one body or spot.
- Coenocytic* Multinucleate; mycelia having no cell walls.
- Columella* Sterile central axis in a mature fruiting body.
- Concentric* One circle within another with a common center.
- Conidiophore* Simple or branched hyphae on which conidia are produced.
- Conidium*, pl. *Conidia* Any asexual spore except sporangiospore or chlamydospore.
- Conk* Term used in forestry for sporophores of Polyporaceae on trees.
- Control* Prevention of, or reduction of loss from, plant disease.
- Coremium*, pl. *Coremia* Synnema, a cluster of erect hyphae bearing conidia.
- Coriaceous* Like leather in texture.
- Culturing* Artificial propagation of organisms on nutrient media or living plants.
- Cystidium*, pl. *Cystidia* Sterile, often swollen cell projecting from hymenium in Basidiomycetes.

- Damping-off* Seed decay in soil, or seedling blight.
- Decumbent* Resting on substratum with ends turned up.
- Decurrent* Running down the stipe or stem.
- Diagnosis* Identification of nature and cause of a disease.
- Dieback* Progressive death of branches or shoots beginning at tips.
- Defoliate* To strip or become stripped of leaves.
- Dichotomous* Branching, frequently successive, into two more or less equal arms.
- Dimidiate* Having one half smaller than the other; of a perithecium, having outer wall covering only top half.
- Discomycetes* The cup fungi, a subclass of Ascomycetes; with apothecia.
- Disease* A condition in which use or structure of any part of the living organism is not normal.
- Disinfection* Freeing a diseased plant, organ, or tissue from infection.
- Disinfestation* Killing or inactivating disease organisms before they can cause infection; on surface of seed or plant part, or in soil.
- Dissemination* Transport of inoculum from a diseased to a healthy plant.
- Disjuncter* Cell or projection connecting spores of a chain.
- Duster* Apparatus for applying fungicides in dry form.
- Echinulate* Having small, pointed spines; used of spores.
- Endoconidium*, pl. *Endoconidia* Conidium formed within a hypha.
- Enphytotic* A plant disease causing constant damage from year to year.
- Epiphytotic* Sudden and destructive development of a plant disease over an extensive area, an epidemic.
- Eradicant Fungicide* One that destroys a fungus at its source.
- Eradication* Control of disease by eliminating the pathogen after it is already established.
- Erumpent* Breaking through surface of substratum.
- Excentric* Off center.
- Exclusion* Control of disease by preventing its introduction into disease-free areas.
- Exudate* Liquid discharge from diseased tissues.
- Fasciation* Joining side by side; a plant disease with flattened and sometimes curved shoots.
- Fascicle* A small bundle or cluster.
- Filiform* Threadlike.
- Fimbriate* Fringed, or toothed.
- Flag* A branch with dead leaves on an otherwise green tree.
- Flagellum*, pl. *Flagella* Whiplike organ on a motile cell; cilium.
- Fruiting Body* Fungus structure containing or bearing spores; mushroom, pycnidium, perithecium, apothecium, etc.
- Fumigant* A volatile disinfectant, destroying organisms by vapor.
- Fungicide* Chemical or physical agent that kills or inhibits fungi.
- Fungi Imperfecti* Fungi that have not been connected with the perfect or sexual stage; most are imperfect states of Ascomycetes.
- Fungistatic* An agent preventing development of fungi without killing them.

- Fungus*, pl. *Fungi* An organism with no chlorophyll, reproducing by sexual or asexual spores, usually with mycelium with well-marked nuclei.
- Fusiform* Spindle-like, narrowing toward the ends.
- Fusoid* Somewhat fusiform.
- Gall* Outgrowth or swelling, often more or less spherical, of unorganized plant cells as result of attack by bacteria, fungi, or other organisms.
- Gametangium* Gamete mother cell.
- Gamete* A sex cell, especially one formed in a gametangium.
- Germ Tube* Hypha produced by a germinated fungus spore.
- Gill* Lamella or hymenium-covered plate on underside of cap of a mushroom.
- Girdle* A canker that surrounds stem, completely cutting off water supply and thus causing death; girdling roots also cause death.
- Glabrous* Smooth.
- Gleba* Sporulating tissue in an angiocarpous fruit body.
- Globose* Almost spherical.
- Gram-negative*, *Gram-positive* Not being stained, and being stained, by the Gram stain used in classifying bacteria.
- Haustorium*, pl. *Haustoria* Special hyphal branch extended into living cell for purpose of absorbing food.
- Heteroecious* Undergoing different parasitic stages on two unlike hosts, as in the rusts.
- Heterothallic* Of a fungus, sexes separate in different mycelia.
- Holocarpic* Having all the thallus used for a fruiting body.
- Homothallic* Both sexes present in same mycelium.
- Host* Any plant attacked by a parasite.
- Hyaline* Colorless, or nearly transparent.
- Hymenium* Spore-bearing layer of a fungus fruiting body.
- Hyperplastic* Term applied to a disease producing an abnormally large number of cells.
- Hypha*, pl. *Hyphae* Single thread of a fungus mycelium.
- Hypoplastic* Term applied to a disease with subnormal cell production.
- Hyphopodium*, pl. *Hyphopodia* More or less lobed appendage to a hypha.
- Hysterothecium* Oblong or linear perithecium, sometimes considered an apothecium, opening by a cleft.
- Immune* Exempt from disease; having qualities that do not permit infection.
- Immunization* Process of increasing the resistance of a living organism.
- Imperfect Fungus* One lacking any sexual reproductive state.
- Imperfect State* State of life-cycle in which asexual spores, or none, are produced.  
See Anamorph.
- Incubation Period* Time between inoculation and development of symptoms that can be seen.
- Indehiscent* Of fruit bodies, not opening, or with no special method.
- Infection* Process of beginning or producing disease.
- Infection Court* Place where an infection may take place, as leaf, fruit, petal, etc.

*Injury* Result of transient operation of an adverse factor, as an insect bite, or action of a chemical.

*Innate* Bedded in, immersed.

*Inoculation* Placing of inoculum in infection court.

*Inoculum* Pathogen or its part, as spores, fragments of mycelium, etc., that can infect plants.

*Inoperculate* Not opening by a lid.

*Intercellular* Between cells.

*Intracellular* Within cells.

*Intumescence* Knoblike or pustule like outgrowth of elongated cells on leaves, stems, etc., caused by environmental disturbances.

*Lamella* Gill.

*Lesion* Localized spot of diseased tissue.

*Locule* A cavity, especially one in a stroma.

*Macroconidia* Large conidia.

*Macroscopic* Large enough to be seen with the naked eye.

*Medulla* Loose layer of hyphae inside a thallus; body of a sclerotium.

*Microconidia* Very small spores, now considered spermatia of a fungus also having larger conidia.

*Micron* 1/1,000 mm, unit used for measuring spores.

*Microscopic* Too small to be seen except with the aid of a microscope; true of most of the fungus structures shown in line drawings in this book.

*Mildew* Plant disease in which the pathogen is a growth on the surface.

*Molds* Fungi with conspicuous mycelium or spore masses, often saprophytes.

*Monoecious* Male and female reproductive organs in same individual; in rusts, all stages of life cycle on single species of plant.

*Multinucleate* Several nuclei in same cell.

*Mummy* Dried, shriveled fruit, result of disease.

*Muriform* Having cross and longitudinal septa.

*Mushroom* An agaric fruit body.

*Mycelium*, pl. *Mycelia* Mass of fungus hyphae.

*Mycelia Sterilia* Fungi Imperfecti where spores, except for chlamydo spores, are not present.

*Mycoplasmalike Organism* (MLO) A wallless prokaryotic plant pathogen which has a single-unit membrane. See Phytoplasma.

*Mycorrhiza*, pl. *Mycorrhizae* Symbiotic, nonpathogenic association of fungi and roots.

*Necrosis* Death of plant cells, usually resulting in tissue turning dark.

*Necrotic* As an adjective, killing.

*Nematicide* Chemical or physical agent killing nematodes.

*Nematodes* Nemas, roundworms, eelworms, cause of some plant diseases.

*Obligate Parasite* A parasite that can develop only in living tissues, with no saprophytic stage.

- Obovate* Inversely ovate, narrowest at base.
- Obtuse* Rounded or blunted, greater than a right angle.
- Oogonium*, pl. *Oogonia* Female sex organ in the Oomycetes.
- Oomycetes* Subclass of the Phycomycetes, gametangia of unequal size.
- Oospore* Resting spore formed in a fertilized oogonium.
- Operculate* With a cover or lid, as in some asci.
- Ostiole* Porelike mouth or openings in papilla or neck of a perithecium or pycnidium.
- Papilla*, pl. *Papillae* Small, nipplelike projection.
- Paraphysis*, pl. *Paraphyses* A sterile hyphal element in the hymenium, especially in the Ascomycetes, usually clavate or filiform.
- Paraphysoids* Threads of hyphal tissue between asci, like delicate paraphyses but without free ends.
- Parasite* An organism that lives on or in a second organism, usually causing disease in the latter.
- Pathogen* Any organism or factor causing disease.
- Pathogenic* Capable of causing disease.
- Pedicel* Small stalk.
- Perfect State* Stage of life-cycle in which spores are formed after nuclear fission.  
See Teleomorph.
- Peridium* Wall or limiting membrane of a sporangium or other fruit body, or of a rust sorus.
- Perithecium* Subglobose or flasklike ascocarp of the Pyrenomycetes.
- Phialide* A cell that develops one or more open ends from which a basipetal succession of conidia develops without an increase in length of the phialide itself.
- Physiogenic Disease* Caused by unfavorable environmental factors.
- Physiologic Races* Pathogens of same variety and species structurally the same but differing in physiological behavior, especially in ability to parasitize a given host.
- Phytopathology* Plant pathology, science of plant disease.
- Phytoplasma* A MLO that is pathogenic to plants.
- Pileus* Hymenium-supporting part of a fruit body of a higher fungus; the cap of a mushroom.
- Primary Infection* First infection by a pathogen after going through a resting or dormant period.
- Prokaryotic* Organisms which lack a true nucleus; includes bacteria and mycoplasma-like organisms.
- Promycelium* Basidium of rusts and smuts.
- Pulvinate* Cushionlike in form.
- Pycnidium*, pl. *Pycnidia* Flasklike fruiting body containing conidia.
- Pycnium* Spermogonium in the rusts, the 0 stage, resembling a pycnidium.
- Resistance* Ability of a host plant to suppress or retard activity of a pathogen.
- Resting Spore* A spore, often thick-walled, that can remain alive in a dormant condition for some time, later germinating and capable of initiating infection.
- Resupinate* Flat on the substratum with hymenium on outer side.
- Rhizoid* Rootlike structure.



- Rhizomorph* A cordlike strand of fungus hyphae.
- Ring Spot* Disease symptoms characterized by yellowish or necrotic rings with green tissue inside the ring, as in virus diseases.
- Roguing* Removal of undesired individual plants.
- Rosette* Disease symptom with stems shortened to produce a bunchy growth habit.
- Russet* Brownish roughened areas on skins of fruit, from abnormal production of cork caused by disease, insect, or spray injury.
- Rust* A fungus, one of the Uredinales, causing a disease also known as rust.
- Saprophyte* An organism that feeds on lifeless organic matter.
- Scab* Crustlike disease lesion; or a disease in which scabs are prominent symptoms.
- Sclerotium*, pl. *Sclerotia* Resting mass of fungus tissue, often more or less spherical, normally having no spores in or on it.
- Scorch* Burning of tissue, from infection or weather conditions.
- Scutellum* Plate or shieldlike cover, as in Microthyriales.
- Septate* Having cross-walls, septa.
- Sessile* Having no stem.
- Seta*, pl. *Setae* A stiff hair, or bristle, generally dark-colored.
- Shot Hole* A disease symptom in which small round fragments drop out of leaves, making them look as if riddled by shot.
- Sign* Any indication of disease other than reaction of the host plant – pores, mycelium, exudate, or fruiting bodies of the pathogen.
- Slurry* Thick suspension of chemical; used for seed treatment.
- Smut* A fungus of the Ustilaginales, characterized by sooty spore masses; the name also used for the disease caused by the smut.
- Sooty Mold* Dark fungus growing in insect honeydew.
- Sorus*, pl. *Sori* Fungus spore mass, especially of rusts and smuts; occasionally, a group of fruiting bodies.
- Species* One sort of plant or animal; abbreviated as “sp.” singular, and “spp.” plural. A genus name followed by sp. means that the particular species is undetermined. Spp. following a genus name means that several species are grouped together without being named individually.
- Spermogonium* Walled structure in which spermatia are produced, a pycnium.
- Spermatium*, pl. *Spermatia* a sex cell (+ or –), a pycniospore.
- Sporangiole* Small sporangium without a columella and with a small number of spores.
- Sporangiophore* Hypha bearing a sporangium.
- Sporangium* Organ producing nonsexual spores in a more or less spherical wall.
- Spore* A single-to many-celled reproductive body, in the fungi and lower plants, which can develop a new plant.
- Sporidium*, pl. *Sporidia* Basidiospore of rusts and smuts.
- Sporodochium*, pl. *Sporodochia* Cluster of conidiophores interwoven on a stroma or mass of hyphae.
- Sporophore* Spore-producing or supporting structure – fruit body; used especially in the Basidiomycetes.

- Sporulate* To produce spores.
- Sprayer* Apparatus for applying chemicals in liquid form.
- Sterigma*, pl. *Sterigmata* Projection for supporting a spore.
- Stipe* A stalk. *Stipitate*. Stalked.
- Strain* An organism or group of organisms differing in origin or minor aspects from other organisms of same species or variety.
- Stroma*, pl. *Stromata* Mass of fungus hyphae often including host tissue containing or bearing spores.
- Subiculum*, *Subicle* Netlike woolly or crustlike growth of mycelium under fruit bodies.
- Substrate* The substance or object on which a saprophytic organism lives and from which it gets nourishment.
- Suscept* A living organism attacked by, or susceptible to, a given disease or pathogen; in many cases a more precise term than host but less familiar.
- Susceptible* Unresistant, permitting the attack of a pathogen.
- Swarmspore* Zoospore.
- Synnema*, pl. *Synnemata* Groups of hyphae sometimes joined together, generally upright and producing spores; coremium.
- Systemic* Term applied to disease in which single infection leads to general spread of the pathogen throughout the plant body; or to a chemical that acts through the vascular system.
- Teleomorph* State of life-cycle in which spores are formed after nuclear fission.
- Teliospore* Winter or resting form of rust spore, from which basidium is produced.
- Telium* Sorus producing teliospores.
- Thallophyte* One of the simpler plants, belonging to the algae, bacteria, fungi, slime molds, or lichens.
- Thallus* Vegetative body of a thallophyte.
- Tolerant* Capable of sustaining disease without serious injury or crop loss.
- Toxin* Poison formed by an organism.
- Tylosi*, pl. *Tyloses* Cell outgrowth into cavity of xylem vessel, plugging it.
- Urediospore* Summer spore of rusts; one-celled, verrucose.
- Uredium* Sorus producing urediospores.
- Valsoid* Having groups of perithecia with beaks pointing inward, or even parallel with surface, as in valsa.
- Vector* An agent, insect, man, etc., transmitting disease.
- Vein-banding* Symptom of virus disease in which regions along veins are darker green than the tissue between veins.
- Verrucose* With small rounded processes or warts.
- Viroid* The smallest known viruslike infectious agent having no protein coat and only a small amount of nucleic acid.
- Virulent* Highly pathogenic; with strong capacity for causing disease.
- Viruliferous* Virus-carrying; term applied particularly to virus-laden insects.

*Virus* An obligate parasite capable of multiplying in certain hosts, ultramicroscopic, recognizable by the effects produced in infected hosts. Has nucleic acid with protein coat.

*Wilt* Loss of freshness or drooping of plants due to inadequate water supply or excessive transpiration; a vascular disease interfering with utilization of water.

*Witches' Broom* Disease symptom with abnormal brushlike development of many weak shoots.

*Yellows* Term applied to disease in which yellowing or chlorosis is a principal symptom.

*Zoospore* A swimming spore, swarmspore, capable of independent movement.

*Zygomycetes* Subclass of the Phycomycetes, characterized by gametes of equal size.

*Zygospore* Resting spore formed from the union of similar gametes.