

Northeast Extension Systems



Northeast VEGETABLE & STRAWBERR PEST IDENTIFICATION GUID

WEEDS › INSECTS › DISEASES › PHYSIOLOGICAL DISORDERS

UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING.

Northeast Vegetable & Strawberry Pest Identification Guide

Co-Editors:

A. Richard Bonanno, University of Massachusetts

Ruth Hazzard, University of Massachusetts

Assistant Editors:

Kate Everts, University of Maryland
and University of Delaware

David Handley, University of Maine

Cathy Heidenreich, Cornell University

John Howell, University of Massachusetts

Bradley Majek, Rutgers University

Joanne Whalen, University of Delaware

Robert Wick, University of Massachusetts

Jude Boucher, University of Connecticut

Susan Scheufele, University of Massachusetts

Contents last revised in 2013

Partial funding for this document was provided by

the U.S. E.P.A., Region 1,
Strategic Agricultural Initiative Program Funds.
Grant Number: X8971450010

USDA CSREES

The Vegetable IPM Working Group
Northeastern IPM Center

UMass Extension

Weeds

Common Name	Latin Name	Plate	Page
Barnyardgrass	<i>Echinochloa crusgalli</i>	W-1	10
Bedstraw, Catchweed	<i>Galium aparine</i>	W-2	10
Bindweed, Field	<i>Convolvulus arvensis</i>	W-3	10
Campion, White	<i>Silene alba</i>	W-4	10
Canada Thistle	<i>Cirsium arvense</i>	W-5	10
Carolina Geranium (Cranesbill)	<i>Geranium carolinianum</i> L.	W-6	10
Carpetweed	<i>Mollugo verticillata</i>	W-7	10
Chickweed	<i>Stellaria media</i>	W-8	10
Clover	<i>Trifolium</i> sp.	W-9	10
Clover, Red	<i>Trifolium pretense</i>	W-10	11
Cocklebur	<i>Xanthium strumarium</i>	W-11	11
Crabgrass	<i>Digitaria sanguinalis</i>	W-12	11
Crabgrass	(2 images)	W-13	11
Curly Dock	<i>Rumex crispus</i>	W-14	11
Dandelion	<i>Taraxacum officinale</i>	W-15	11
Foxtail, Green	<i>Setaria viridis</i>	W-16	11
Foxtail, Yellow	<i>Setaria glauca</i>	W-17	11
Galinsoga	<i>Galinsoga ciliata</i>	W-18	11
Goldenrod	<i>Solidago</i> sp.	W-19	12
Goosegrass	<i>Eleusine indica</i>	W-20	12
Groundsel, Common	<i>Senecio vulgaris</i>	W-21	12
Groundsel, Common	(2 images)	W-22	12
Horsetail, Field	<i>Equisetum arvense</i>	W-21	12
Jimsonweed	<i>Datura stramonium</i>	W-24	12
Johnsongrass	<i>Sorghum halpense</i>	W-25	12
Lambsquarters, Common	<i>Chenopodium album</i>	W-26	12
Lettuce, Prickly	<i>Lactuca serriola</i>	W-27	12
Mallow, Common	<i>Malva neglecta</i>	W-28	13
Marestail (horseweed)	<i>Conyza canadensis</i>	W-29	13
Morningglory	<i>Ipomea</i> sp.	W-30	13
Mustard, Wild	<i>Brassica kaber</i>	W-31	13
Nettle, Purple Dead	<i>Lamium purpureum</i>	W-32	13
Nightshade	<i>Solanum</i> sp.	W-33	13
Nightshade, Eastern Black	<i>Solanum ptycanthum</i>	W-34	13

Common Name	Latin Name	Plate	Page
Nutsedge, Yellow	<i>Cyperus esculentum</i>	W-35	13
Oats	<i>Avena fatua</i> L.	W-36	13
Orchardgrass	<i>Dactylis glomerata</i>	W-37	14
Panicum, Fall	<i>Panicum dichotomiflorum</i>	W-38	14
Pansy, Field	<i>Viola arvensis</i>	W-39	14
Pennycress, Field	<i>Thlaspi arvense</i>	W-40	14
Pepperweed, Virginia	<i>Lepidium virginicum</i>	W-41	14
Pigweed, Redroot	<i>Amaranthus retroflexus</i>	W-42	14
Pimpernel, Scarlet	<i>Anagallis arvensis</i> L.	W-43	14
Pimpernel, Scarlet	(2 images)	W-44	14
Pineapple-weed	<i>Matricaria discoidea</i>	W-45	14
Purslane, Common	<i>Portulaca oleracea</i>	W-46	15
Quackgrass	<i>Elymus repens</i>	W-47	15
Quackgrass	(2 images)	W-48	15
Ragweed, Common	<i>Ambrosia artemisifolium</i>	W-49	15
Rye, Annual	<i>Lolium multiflorum</i> Lam.	W-50	15
Rye, Annual	(2 images)	W-51	15
Shepherdspurse	<i>Capsella bursa-pastoris</i>	W-52	15
Shepherdspurse	(2 images)	W-53	15
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	W-54	15
Sorrel, Red	<i>Rumex acetosella</i>	W-55	16
Sorrel, Red	(2 images)	W-56	16
Sorrel, Yellow Wood (Oxalis)	<i>Oxalis stricta</i>	W-57	16
Sowthistle, Perennial	<i>Sonchus arvensis</i>	W-58	16
Speedwell, Common	<i>Veronica officinalis</i> L.	W-59	16
Speedwell, Corn	<i>Veronica arvensis</i> L.	W-60	16
Terbacil	pesticide injury	W-61	16
Toadflax, Yellow			
(Butter & Eggs)	<i>Linaria vulgaris</i>	W-62	16
Velvetleaf	<i>Abutilon theophrasti</i>	W-63	16

Insects ▼

Common Name	Latin Name	Plate	Page
Aphid, Cabbage	<i>Brevicoryne brassicae</i>	I-1	17
Aphid, Corn Leaf	<i>Rhopalosiphum maidis</i>	I-2	17
Aphid, Green Peach	<i>Myzus persicae</i>	I-3	17
Aphid, Melon	<i>Aphis gossypii</i>	I-4	17
Aphid, Pea	<i>Acyrtosiphon pisum</i>	I-5	17
Aphid, Potato	<i>Macrosiphum euphorbiae</i>	I-6	17
Asiatic Garden Beetle	<i>Maladera castanea</i>	I-7	17
Asiatic Garden Beetle	(3 images)	I-8	17
Asiatic Garden Beetle		I-9	17
Asparagus Beetle, Common	<i>Crioceris duodecimpunctata</i>	I-10	18
Asparagus Beetle, Common	(2 images)	I-11	18
Asparagus Beetle, Spotted	<i>Creoceris duodecimpunctata</i>	I-12	18
Asparagus Miner	<i>Ophiomyia simplex</i>	I-13	18
Asparagus Miner	(2 images)	I-14	18
Asparagus Miner	<i>Ophiomyia simplex</i>	I-15	18
Bean Leaf Beetle	<i>Cerotoma trifurcata</i>	I-16	18
Beet Armyworm	<i>Spodoptera exigua</i>	I-17	18
Beet Armyworm	(2 images)	I-18	18
Blister Beetle, Margined	<i>Epicauta funebris</i>	I-19	19
Cabbage Looper	<i>Trichoplusia ni</i>	I-20	19
Cabbage Maggot	<i>Delia radicum</i>	I-21	19
Cabbage Maggot	(3 images)	I-22	19
Cabbage Maggot		I-23	19
Carrot Rust Fly	<i>Psila rosae</i>	I-24	19
Carrot Weevil	<i>Listronotus oregonensis</i>	I-25	19
Colorado Potato Beetle	<i>Leptinotarsa decemlineata</i>	I-26	19
Colorado Potato Beetle	(2 images)	I-27	19
Corn Earworm	<i>Helicoverpa zea</i>	I-28	20
Corn Earworm	(3 images)	I-29	20
Corn Earworm & Fall Armyworm		I-30	20
Cross-striped Cabbageworm	<i>Evergestis rimosalis</i>	I-31	20
Cross-striped Cabbageworm	(2 images)	I-32	20

Common Name	Latin Name	Plate	Page
Cucumber Beetle, Spotted	<i>Diabrotica undecimpunctata</i>	I-33	20
Cucumber Beetle, Striped	<i>Acalymma vittatum</i>	I-34	20
Cutworm, Black	<i>Agrotis ipsilon</i>	I-35	20
Cutworm Damage		I-36	20
Cutworm, Variegated	<i>Peridroma saucia</i>	I-37	21
Diamondback Moth	<i>Plutella xylostella</i>	I-38	21
Diamondback Moth	(2 images)	I-39	21
European Corn Borer	<i>Ostrinia nubilalis</i>	I-40	21
European Corn Borer	(3 images)	I-41	21
European Corn Borer		I-42	21
Fall Armyworm	<i>Spodoptera frugiperda</i>	I-43	21
Fall Armyworm	(2 images)	I-44	21
Flea Beetle, Corn	<i>Chaetocnema pulicaria</i>	I-45	21
Flea Beetle, Crucifer	<i>Phyllotreta cruciferae</i>	I-46	22
Flea Beetle, Crucifer	(2 images)	I-47	22
Flea Beetle, Eggplant	<i>Epitrix fuscula</i>	I-48	22
Flea Beetle, Striped	<i>Phyllotreta striolata</i>	I-49	22
Fungus Gnat, Darkwinged	<i>Bradysia</i> spp.	I-50	22
Fungus Gnat, Darkwinged	(2 images)	I-51	22
Harlequin Bug	<i>Murgantia histrionica</i>	I-52	22
Harlequin Bug	(2 images)	I-53	22
Hornworm, Tomato	<i>Manduca quinquemaculata</i>	I-54	22
Imported Cabbageworm	<i>Pieris rapae</i>	I-55	23
Imported Cabbageworm	(2 images)	I-56	23
Imported Cabbageworm	<i>Pieris rapae</i>	I-57	23
Japanese Beetle	<i>Popillia japonica</i>	I-58	23
Japanese Beetle	(2 images)	I-59	23
Leafhopper, Aster	<i>Macrosteles quadrilineatis</i>	I-60	23
Leafhopper, Potato	<i>Empoasca fabae</i>	I-61	23
Leafhopper, Potato	(3 images)	I-62	23
Leafhopper, Potato		I-63	23
Leafminer, Beet	<i>Pegomya betae</i>	I-64	24

Common Name	Latin Name	Plate	Page
Leafminer, Vegetable	<i>Liriomyza sativae</i>	I-65	24
Mexican Bean Beetle	<i>Epilachna varivestis</i>	I-66	24
Mite, Twospotted Spider	<i>Tetranychus urticae</i>	I-67	24
Mite, Twospotted Spider	(2 images)	I-68	24
Northern Corn Rootworm	<i>Diabrotica barberi</i>	I-69	24
Onion Maggot	<i>Delia antiqua</i>	I-70	24
Oriental Beetle	<i>Exomala orientalis</i>	I-71	24
Pepper Maggot	<i>Zonosemata electa</i>	I-72	24
Pepper Maggot	(3 images)	I-73	25
Pepper Maggot		I-74	25
Pepper Weevil adult	<i>Anthonomus eugeni</i>	I-75	25
Pepper Weevil larva	(2 images)	I-76	25
Saltmarsh Caterpillar	<i>Estigmene acrea</i>	I-77	25
Sap Beetle, Dusky	<i>Carpophilus lugubris</i>	I-78	25
Sap Beetle, Fourspotted	<i>Glischrochilus quadrisignatus</i>	I-79	25
Sap Beetle, Fourspotted	(2 images)	I-80	25
Seedcorn Maggot	<i>Delia platura</i>	I-81	25
Slug, Grey Garden	<i>Decroceras reticulatum</i>	I-82	26
Slug, Grey Garden	(2 images)	I-83	26
Soybean Looper	<i>Pseudoplusia includens</i>	I-84	26
Spotted Wing Drosophila	<i>Drosophila suzukii</i>	I-85	26
Spotted Wing Drosophila	(4 images)	I-86	26
Spotted Wing Drosophila		I-87	26
Spotted Wing Drosophila		I-88	26
Squash Bug	<i>Anasa tristis</i>	I-89	26
Squash Bug	(3 images)	I-90	26
Squash Bug		I-91	27
Squash Vine Borer	<i>Melittia cucurbitae</i>	I-92	27
Squash Vine Borer	(2 images)	I-93	27
Stalk Borer, Common	<i>Papaipema nebris</i>	I-94	27
Stink Bug	<i>Euschistus</i> spp.	I-95	27
Stink Bug, Brown	<i>Euschistus servus</i>	I-96	27

Common Name	Latin Name	Plate	Page
Stink bug, Green	<i>Acrosernum hilare</i>	I-97	27
Stink bug, Marmorated	<i>Halyomorpha halys</i>	I-98	27
Swede Midge	<i>Contarinia nasturtii</i>	I-99	27
Swede Midge	(2 images)	I-100	28
Tarnished Plant Bug	<i>Lygus lineolaris</i>	I-101	28
Tarnished Plant Bug	(2 images)	I-102	28
Thrips, Onion	<i>Thrips tabaci</i>	I-103	28
Thrips, Onion	(3 images)	I-104	28
Thrips, Onion		I-105	28
Thrips, Western Flower	<i>Frankliniella occidentalis</i>	I-106	28
Thrips, Western Flower	(2 images)	I-107	28
Tomato Fruitworm	<i>Helicoverpa zea</i>	I-108	28
Tomato Pinworm	<i>Keiferia lycopersicella</i>	I-109	29
Tortoise Beetle, Clavate	<i>Plagiometriona clavata</i>	I-110	29
Tortoise Beetle, Clavate	(2 images)	I-111	29
True Armyworm	<i>Pseudaletia unipunctata</i>	I-112	29
Webworm, Garden	<i>Achyra rantalis</i>	I-113	29
Webworm, Hawaiian Beet & Garden	<i>Spoladea recurvalis</i>	I-114	29
Western Corn Rootworm	<i>Diabrotica vergifera</i>	I-115	29
Whitefly, Greenhouse	<i>Trialeurodes vaporariorum</i>	I-116	29
Wireworm	<i>Melanotus</i> spp.	I-117	29
Wireworm	(2 images)	I-118	30
Beneficial Insects:			
Insidious Flower Bug	<i>Orius insidiosus</i>	I-119	30
Ladybeetle larva	species unknown	I-120	30
Ladybeetle, Multicolored Asian	<i>Harmonia axyridis</i>	I-121	30
Ladybeetle, Twelve Spotted	<i>Coleomegilla maculata</i>	I-124	30
Spined Soldier Bug	<i>Podisus maculiventris</i>	I-123	30
Syrphid Fly larvae	<i>Syrphid</i> species	I-124	30
Predatory Midge	<i>Aphidoletes aphidimyza</i>	I-125	30
Parasite of imported cabbageworm	<i>Cotesia rubecula</i> species	I-126	30

Diseases & Disorders

Vegetable & Disease/Disorder	Plate	Page
Alliums, Downy Mildew	D-1	31
Alliums, Leaf Blight	D-2	31
Alliums, Purple Blotch	D-3	31
Asparagus, Fusarium Wilt	D-4	31
Asparagus, Rust	D-5	31
Basil, Downy Mildew	D-6	31
(3 images)	D-7	31
	D-8	31
Bean, Anthracnose	D-9	31
Bean, Bacterial Blight	D-10	32
Bean, Brown Spot	D-11	32
Bean, Downy Mildew	D-12	32
Bean, Phytophthora Blight	D-13	32
(3 images)	D-14	32
	D-15	32
Bean, Rhizoctonia Root Rot	D-16	32
Bean, Root and Crown Rot	D-17	32
Bean, Rust	D-18	32
Bean, Virus	D-19	33
Bean, White Mold	D-20	33
Beet, Phoma Leaf Spot	D-21	33
Brassicas, Alternaria Leaf Spot	D-22	33
Brassicas, Alternaria Leaf Spot	D-23	33
Brassicas, Alternaria Leaf Spot	D-24	33
Brassicas, Alternaria Leaf Spot	D-25	33
Brassicas, Black Leg	D-26	33
Brassicas, Black Rot	D-27	33

Vegetable & Disease/Disorder	Plate	Page
Brassicas, Black Rot	D-28	34
Brassicas, Boron Deficiency	D-29	34
Brassicas, Clubroot	D-30	34
Brassicas, Downy Mildew	D-34	34
Brassicas, Downy Mildew	D-32	34
Brassicas, Downy Mildew	D-33	34
Brassicas, Tip Burn	D-34	34
Brassicas, White Mold	D-35	34
Brassicas, Yellows	D-36	34
Calabasa, Black Rot	D-37	35
Carrot, Alternaria Leaf Blight	D-38	35
Carrot, Bacterial Leaf Blight	D-39	35
Carrot, Black Root Rot	D-40	35
Carrot, Root-Knot Nematode	D-41	35
Celery, Heart Rot	D-42	35
Celery, Heart Rot	D-43	35
Chard, Cercospora Leaf Spot	D-44	35
Corn, Northern Corn Leaf Blight	D-45	35
Corn, Northern Corn Leaf Blight	D-46	36
Corn, Rust	D-47	36
Corn, Smut	D-48	36
Corn, Stewart's Wilt	D-49	36
Corn, Stewart's Wilt	D-50	36
Cucurbits, Angular Leaf Spot	D-51	36
Cucurbits, Angular Leaf Spot	D-52	36
Cucurbits, Anthracnose	D-53	36
Cucurbits, Anthracnose	D-54	36

Vegetable & Disease/Disorder	Plate	Page
Cucurbits, Anthracnose	D-55	37
Cucurbits, Bacterial Fruit Blotch	D-56	37
Cucurbits, Bacterial Wilt	D-57	37
Cucurbits, Belly Rot	D-58	37
Cucurbits, Black Rot	D-59	37
Cucurbits, Black Rot	D-60	37
Cucurbits, Black Rot	D-61	37
Cucurbits, Black Rot	D-62	37
Cucurbits, Deer Damage	D-63	37
Cucurbits, Downy & Powdery Mildews	D-64	38
Cucurbits, Downy Mildew	D-65	38
Cucurbits, Downy Mildew	D-66	38
Cucurbits, Downy Mildew	D-67	38
Cucurbits, Downy Mildew	D-68	38
Cucurbits, Fruit Abortion	D-69	38
Cucurbits, Fruit Rot	D-70	38
Cucurbits, Fusarium Rot	D-71	38
Cucurbits, Fusarium Wilt	D-72	38
Cucurbits, Fusarium Wilt	D-73	39
Cucurbits, Fusarium Wilt	D-74	39
Cucurbits, Gummy Stem Blight	D-75	39
Cucurbits, Gummy Stem Blight	D-76	39
Cucurbits, Leaf Blight	D-77	39
Cucurbits, Manganese Toxicity	D-78	39
Cucurbits, Ozone Injury	D-79	39
Cucurbits, Phytophthora Blight	D-80	39
Cucurbits, Phytophthora Blight	D-81	39

Vegetable & Disease/Disorder	Plate	Page
Cucurbits, Phytophthora Blight	D-82	40
Cucurbits, Phytophthora Blight	D-83	40
Cucurbits, Phytophthora Blight	D-84	40
Cucurbits, Phytophthora Blight	D-85	40
Cucurbits, Plectosporium	D-86	40
Cucurbits, Plectosporium	D-87	40
Cucurbits, Plectosporium	D-88	40
Cucurbits, Plectosporium	D-89	40
Cucurbits, Powdery Mildew	D-90	40
Cucurbits, Powdery Mildew	D-91	41
Cucurbits, Powdery Mildew	D-92	41
Cucurbits, Pythium Cottony Leak	D-93	41
Cucurbits, Scab	D-94	41
Cucurbits, Scab	D-95	41
Cucurbits, Scab	D-96	41
Cucurbits, Septoria Leaf Spot	D-97	41
Cucurbits, Virus	D-98	41
Cucurbits, Virus	D-99	41
Cucurbits, Wind Burn	D-100	42
Cucurbits, Woodchuck Damage	D-101	42
Eggplant, Anthracnose	D-102	42
Eggplant, Phytophthora Blight	D-103	42
Eggplant, Pythium Cottony Leak	D-104	42
Eggplant, Verticillium Wilt	D-105	42
Eggplant, Verticillium Wilt	D-106	42
Garlic, Bloat Nematode	D-107	42
Lettuce, Bottom Rot	D-108	42

Vegetable & Disease/Disorder	Plate	Page
Lettuce, Septoria Blight	D-109	43
Lightning	D-110	43
Okra, Verticillium Wilt	D-111	43
Parsley, Septoria Leaf Spot	D-112	43
Parsnip, Bacterial Soft Rot	D-113	43
Parsnip, Itersonilia Blight	D-114	43
Parsnip, Leaf Blight	D-115	43
Pea, Bacterial Blight	D-116	43
Pea, Leaf and Pod Spot	D-117	43
Pea, Rhizoctonia Root Rot	D-118	44
Pepper, Anthracnose	D-119	44
Pepper, Anthracnose	D-120	44
Pepper, Bacterial Soft Rot	D-121	44
Pepper, Bacterial Spot	D-122	44
Pepper, Bacterial Spot	D-123	44
Pepper, Bacterial Spot	D-124	44
Pepper, Bacterial Spot	D-125	44
Pepper, Cucumber Mosaic Virus	D-126	44
Pepper, Impatiens Necrotic Spot Virus	D-127	45
Pepper, Phytophthora Blight	D-128	45
Pepper, Root-Knot Nematode	D-129	45
Pepper, Root-Knot Nematode	D-130	45
Pepper, Sunscald	D-131	45
Pepper, Sunscald	D-132	45
Potato, Early Blight	D-133	45
Potato, Late Blight	D-134	45
Potato, Scab	D-135	45

Vegetable & Disease/Disorder	Plate	Page
Spinach, Anthracnose	D-136	46
Spinach, Downy Mildew	D-137	46
Spinach, White Rust	D-138	46
Sweet Potato, Black Rot	D-139	46
Sweet Potato, Fusarium Wilt	D-140	46
Sweet Potato, Pox	D-141	46
Sweet Potato, Scurf	D-142	46
Tomato, Anthracnose	D-143	46
Tomato, Bacterial Canker	D-144	46
Tomato, Bacterial Canker	D-145	47
Tomato, Bacterial Canker	D-146	47
Tomato, Bacterial Canker	D-147	47
Tomato, Bacterial Canker	D-148	47
Tomato, Bacterial Diseases	D-149	47
Tomato, Bacterial Speck	D-150	47
Tomato, Bacterial Spot	D-151	47
Tomato, Bacterial Spot	D-152	47
Tomato, Blossom End Rot	D-153	47
Tomato, Blotchy Ripening	D-154	48
Tomato, Catfacing	D-155	48
Tomato, Early Blight	D-156	48
Tomato, Early Blight	D-157	48
Tomato, Early Blight	D-158	48
Tomato, Fruit Cracking	D-159	45
Tomato, Fruit Cracking	D-160	48
Tomato, Fusarium Wilt	D-161	48
Tomato, Ghost Spot	D-162	48

Vegetable & Disease/Disorder	Plate	Page
Tomato, Late Blight	D-163	49
Tomato, Late Blight	D-164	49
Tomato, Late Blight	D-165	49
Tomato, Leaf Moldt	D-166	49
Tomato, Leaf Mold	D-167	49
Tomato, Phytophthora Blight	D-168	49
Tomato, Pitch Necrosis	D-169	49
Tomato, Powdery Mildew	D-170	49
Tomato, Pythium Rot	D-171	49
Tomato, Rain Check	D-172	50
Tomato, Septoria Leaf Spot	D-173	50
Tomato, Southern Blight	D-174	50
Tomato, Stitching	D-175	50
Tomato, Tobacco Mosaic Virus	D-176	50
Tomato, Tospovirus	D-177	50
Tomato, Verticillium Wilt	D-178	50
Tomato, White Mold	D-179	50
Tomato, White Mold	D-180	50

Strawberry Insects ▼

Common Name	Latin Name	Plate	Page
Strawberry Bud Weevil	<i>Anthonomus signatus</i>	SI-1	51
Strawberry Bud Weevil		SI-2	51
Tarnished Plant Bug	<i>Lygus lineolaris</i>	SI-3	51
Tarnished Plant Bug		SI-4	51
Tarnished Plant Bug		SI-5	51
Thrips (Eastern Flower Thrips)	<i>Thysanoptera</i> spp	SI-6	51
Thrips (Eastern Flower Thrips)		SI-7	51
Twospotted Spider Mites	<i>Tetranychus urticae</i>	SI-8	51
Twospotted Spider Mites		SI-9	51
Cyclamen Mite	<i>Steneotarsonemus pallidus</i>	SI-10	52
Potato Leaf Hopper	<i>Empoasca fabae</i>	SI-11	52
Potato Leaf Hopper		SI-12	52
Spittlebug	<i>Philaenus spumaris</i>	SI-13	52
Cutworm		SI-14	52
Strawberry Rootworm	<i>Paria canella</i>	SI-15	52
Strawberry Root Weevil	<i>Otiorhynchus ovatus</i>	SI-16	52
Black Vine Weevil	<i>Otiorhynchus sulcatus</i>	SI-17	52
Black Vine Weevil		SI-18	52
Root Weevil		SI-19	53
White Grub		SI-20	53
Slug	Several species	SI-21	53
Strawberry Sap Beetle	<i>Stelidota geminata</i>	SI-22	53
Strawberry Sap Beetle		SI-23	53

Strawberry Diseases & Disorders ▼

Common Name	Latin Name	Plate	Page
Gray Mold	<i>Botrytis cineria</i>	SD-1	53
Leather Rot	<i>Phytophthora cactorum</i>	SD-2	53
Anthracnose Fruit Rot	<i>Colletotrichum</i>	SD-3	53
Anthracnose Crown Rot	<i>Colletotrichum</i>	SD-4	53
Phomopsis Leaf Blight	<i>Phomopsis obscurans</i>	SD-5	54
Angular Leaf Spot	<i>Xanthomonas fragariae</i>	SD-6	54
Leaf Spot	<i>Mycosphaerella fragariae</i>	SD-7	54
Leaf Scorch	<i>Diplocarpon earlianum</i>	SD-8	54
Powdery Mildew	<i>Sphaerotheca macularis</i>	SD-9	54
Red Stele Root Rot	<i>Phytophthora fragaria</i>	SD-10	54
Red Stele Root Rot	<i>Phytophthora fragaria</i>	SD-11	54
Verticillium Wilt	<i>Verticillium albo-atrum</i>	SD-12	54
Black Root Rot	Various fungi	SD-13	54
Black Root Rot		SD-14	55
Slime Mold	Various fungi	SD-15	55
Green Petal	Strawberry green petal MLO	SD-16	55
Sunscald		SD-17	55
Winter Injury		SD-18	55
Frost		SD-19	55



W-1 Barnyardgrass – *Echinochloa crusgalli*



W-2 Bedstraw, Catchweed – *Galium aparine*



W-3 Bindweed, Field – *Convolvulus arvensis*



W-4 Campion, White – *Silene alba*



W-5 Canada Thistle – *Cirsium arvense*



W-6 Carolina Geranium (Cranesbill) – *Geranium carolinianum* L.



W-7 Carpenterweed – *Mollugo verticillata*



W-8 Chickweed – *Stellaria media*



W-9 Clover – *Trifolium* sp.



Randall G. Prostak, UMass

W-10 Clover, Red – *Trifolium pretense*

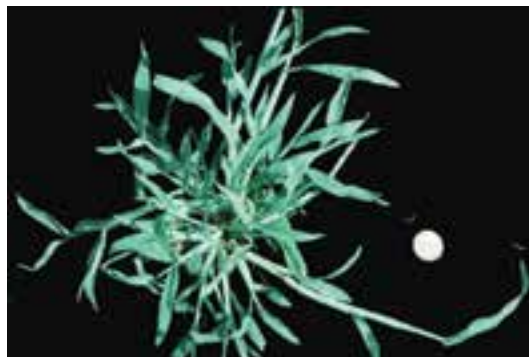


Randall G. Prostak, UMass

W-11 Cocklebur – *Xanthium strumarium*



W-12 Crabgrass – *Digitaria sanguinalis*



W-13 Crabgrass (2nd images) – *Digitaria sanguinalis*



Randall G. Prostak, UMass

W-14 Curly Dock – *Rumex crispus*



Randall G. Prostak, UMass

W-15 Dandelion – *Taraxacum officinale*



W-16 Foxtail, Green – *Setaria viridis*



W-17 Foxtail, Yellow – *Setaria glauca*



W-18 Galinsoga – *Galinsoga ciliata*



Randall G. Prostak, UMass

W-19 Goldenrod – *Solidago* sp.



Randall G. Prostak, UMass

W-20 Goosegrass – *Eleusine indica*



Randall G. Prostak, UMass

W-21 Groundsel, Common – *Senecio vulgaris*



Randall G. Prostak, UMass

W-22 Groundsel, Common – *Senecio vulgaris*



David Handley, UMaine

W-23 Horsetail, Field – *Equisetum arvense*



W-24 Jimsonweed – *Datura stramonium*



W-25 Johnsongrass, Rhizome – *Sorghum balpense*



W-26 Lambsquarters, Common – *Chenopodium album*



Randall G. Prostak, UMass

W-27 Lettuce, Prickly – *Lactuca serriola*



Randall G. Prostak, UMass

W-28 Mallow, Common – *Malva neglecta*



Randall G. Prostak, UMass

W-29 Marestalk (horseweed) – *Conyza canadensis*



W-30 Morningglory – *Ipomea* sp.



W-31 Mustard, Wild – *Brassica kaber*



Randall G. Prostak, UMass

W-32 Nettle, Purple Dead – *Lamium purpureum*



W-33 Nightshade – *Solanum* sp.



Randall G. Prostak, UMass

W-34 Nightshade, Eastern Black – *Solanum ptycanthum*

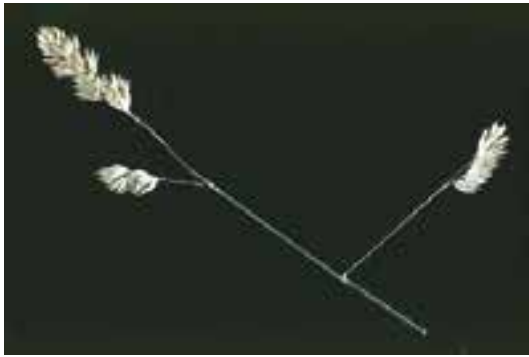


W-35 Nutsedge, Yellow – *Solanum* sp.



Kurt Stuber, Univ. Wisconsin

W-36 Oats – *Avena fatua* L.



W-37 Orchardgrass – *Dactylis glomerata*



W-38 Panicum, Fall – *Panicum dichotomiflorum*



W-39 Pansy, Field – *Viola arvensis*

David Handley, UMaine



W-40 Pennycress, Field – *Thlaspi arvense*

Randall G. Prostak, UMass



W-41 Pepperweed, Virginia – *Lepidium virginicum*

Randall G. Prostak, UMass



W-42 Pigweed, Redroot – *Amaranthus retroflexus*



W-43 Pimpernel, Scarlet – *Anagallis arvensis* L.

Randall G. Prostak, UMass



W-44 Pimpernel, Scarlet – *Anagallis arvensis* L.

Randall G. Prostak, UMass



W-45 Pineapple-weed – *Matricaria discoidea*



W-46 Purslane, Common – *Portulaca oleracea*



W-47 Quackgrass – *Elymus repens*



W-48 Quackgrass – *Elymus repens*



W-49 Ragweed, Common – *Ambrosia artemisiifolium*



W-50 Rye, Annual – *Lolium multiflorum* Lam.



W-51 Rye, Annua – *Lolium multiflorum* Lam.



W-52 Shepherdspurse – *Capsella bursa-pastoris*

Brad Majek, Rutgers Univ.



W-53 Shepherdspurses – *Capsella bursa-pastoris*

Randall G. Prostak, UMass



W-54 Smartweed, Pennsylvania – *Polygonum pensylvanicum*



David Handley, UMaine

W-55 Sorrel, Red – *Rumex acetosella*



Randall G. Prostak, UMass

W-56 Sorrel, Red – *Rumex acetosella*



David Handley, UMaine

W-57 Sorrel, Yellow Wood (Oxalis) – *Oxalis stricta*



Randall G. Prostak, UMass

W-58 Sowthistle, Perennial – *Sonchus arvensis*



Randall G. Prostak, UMass

W-59 Speedwell, Common – *Veronica officinalis* L



Weedalert.com

W-60 Speedwell, Corn – *Veronica arvensis* L



David Handley, UMaine

W-61 Herbicide Injury (terbacil)



Kansas State University

W-62 Toadflax, Yellow (Butter & Eggs) – *Linaria vulgaris*

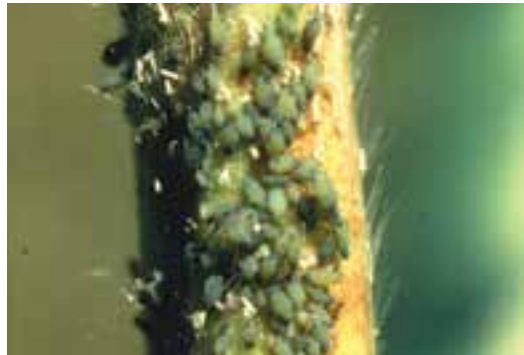


W-63 Velvetleaf – *Abutilon theophrasti*



David N. Ferro, University of Massachusetts

I-1 Aphid, Cabbage, *Brevicoryne brassicae*, 1.6–2.6 mm



David N. Ferro, University of Massachusetts

I-2 Aphid, Corn Leaf, *Rhopalosiphum maidis*, on sweet corn tassel. 1.5–2.4 mm



David N. Ferro, University of Massachusetts

I-3 Aphid, Green Peach, *Myzus persicae*, winged adult female and nymphs on potato. 1.7–2 mm



Martin Spellman

I-4 Aphid, Melon, *Aphis gossypii*, nymphs. Note light brown cases of parasitized aphids, known as 'mummies.' 1–2 mm



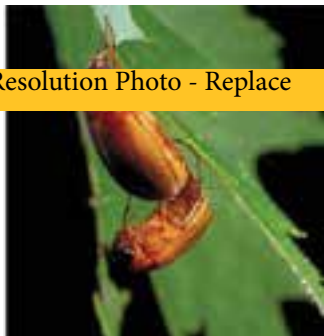
Whitney Cranshaw, Colorado State University

I-5 Aphid, Pea, *Acyrtosiphon pisum*, 2.3–2.7 mm



David N. Ferro, University of Massachusetts

I-6 Aphid, Potato, *Macrosiphum euphorbiae*. 2.1–3.4 mm



David Shetlar, Ohio State University

I-7 Asiatic Garden Beetle, *Maladera castanea*, adult. 8–12 mm



Alan Eaton, University of New Hampshire

I-8 Asiatic Garden Beetle, *Maladera castanea*, damage on basil



Jude Boucher, University of Connecticut

I-9 Asiatic Garden Beetle, *Maladera castanea*, larva. Up to 19 mm



David N. Ferro, University of Massachusetts

I-10 Asparagus Beetle, Common, *Crioceris duodecimpunctata*, adult. 5–6 mm



David N. Ferro, University of Massachusetts

I-11 Asparagus Beetle, Common, *Crioceris duodecimpunctata*, larvae, feeding on asparagus. 1.5–8 mm



David N. Ferro, University of Massachusetts

I-12 Asparagus Beetle, Spotted, *Creoceris duodecimpunctata*, adult. 6–7.5 mm



David N. Ferro, University of Massachusetts

I-13 Asparagus Miner, *Ophiomyia simplex*, adults on asparagus stem. 3–4 mm



David N. Ferro, University of Massachusetts

I-14 Asparagus Miner, *Ophiomyia simplex*, larva and feeding damage on asparagus stem. 0.4–3.5 mm



David N. Ferro, University of Massachusetts

I-15 Asparagus Miner, *Ophiomyia simplex*, damage to roots and crown of asparagus.



Martin Spellman

I-16 Bean Leaf Beetle, *Cerotoma trifurcata*, adult. 3.5–5 mm



Thomas Kuhar, Virginia Tech

I-17 Beet Armyworm, *Spodoptera exigua*, larvae and damage on tomato. 1–22.3 mm



Martin Spellman

I-18 Beet Armyworm, *Spodoptera exigua*, caterpillars, larvae. 2.5–22.3 mm



Jude Boucher, University of Connecticut

I-19 Blister Beetle, Margined, *Epicauta funebris*, adult. 7-15mm



Jude Boucher, University of Connecticut

I-20 Cabbage Looper, *Trichoplusia ni*, caterpillar. 0.2–0.5 mm



David N. Ferro, University of Massachusetts

I-21 Cabbage Maggot, *Delia radicum*, adult fly. 5–7 mm



David N. Ferro, University of Massachusetts

I-22 Cabbage Maggot, *Delia radicum*, eggs, laid in soil at base of stem. 1.1 mm



David N. Ferro, University of Massachusetts

I-23 Cabbage Maggot, *Delia radicum*, maggots and pupae (brown) with damaged roots and stem. 1.5–8 mm



Carol Miles, Washington State University

I-24 Carrot Rust Fly, *Psila rosae*, maggot and damage. 6–9 mm



David N. Ferro, University of Massachusetts

I-25 Carrot Weevil, *Listronotus oregonensis*, adult. 3.5–7 mm



Ruth Hazzard, University of Massachusetts

I-26 Colorado Potato Beetle, *Leptinotarsa decemlineata*, adult. 9–14 mm



Jude Boucher, University of Connecticut

I-27 Colorado Potato Beetle, *Leptinotarsa decemlineata*, larvae in the final instar. 1.5–15 mm



David N. Ferro, University of Massachusetts

I-28 Corn Earworm, *Helicoverpa zea*, adult moth. 32-45 mm



Ruth Hazzard, University of Massachusetts

I-29 Corn Earworm, *Helicoverpa zea*, caterpillar and ear damage. 1.5-24.8 mm



Alan Eaton, University of New Hampshire

I-30 Corn Earworm & Fall Armyworm, head capsules of fall armyworm (left and right) and corn earworm (center) caterpillars.



Thomas Kuhar, Virginia Tech

I-31 Cabbageworm, Cross-striped, *Evergestis rimosalis*, caterpillar. Up to 15-17 mm



Jude Boucher, University of Connecticut

I-32 Cross-striped Cabbageworm, *Evergestis rimosalis*, damage on cabbage.



David N. Ferro, University of Massachusetts

I-33 Cucumber Beetle, Spotted, *Diabrotica undecim-punctata*, adult; also known as Southern Corn Rootworm. 6-7.5 mm



David N. Ferro, University of Massachusetts

I-34 Cucumber Beetle, Striped, *Acalymma vittatum*, adult. 7 mm



Jim Dill, University of Maine

I-35 Cutworm, Black, *Agrotis ipsilon*, caterpillar. 3.5-50 mm



Alan Eaton, University of New Hampshire

I-36 Cutworm, damage, caterpillar in the soil and damage to bean seedling.



R.J. Reynolds Tobacco Company, www.ipmimages.org

I-37 Cutworm, Variegated, *Peridroma saucia*, caterpillar.
2.0–46 mm



Jude Boucher, University of Connecticut

I-38 Diamondback Moth, *Plutella xylostella*, adult moth.
6 mm



Jude Boucher, University of Connecticut

I-39 Diamondback Moth, *Plutella xylostella*, caterpillar.
1.7–11.2 mm



Alan Eaton, University of New Hampshire

I-40 European Corn Borer, *Ostrinia nubilalis*, adult moth (female). Wingspan 20–26 mm (male), 25–34 mm (female)



Ruth Hazzard, University of Massachusetts

I-41 European Corn Borer, *Ostrinia nubilalis*, full-grown caterpillar on corn. 1.5–25.5 mm



Jude Boucher, University of Connecticut

I-42 European Corn Borer, *Ostrinia nubilalis*, caterpillar feeding inside pepper. 1.5–25.5 mm



David N. Ferro, University of Massachusetts

I-43 Fall Armyworm, *Spodoptera frugiperda*, adult.
Wingspan 32–40 mm



Ruth Hazzard, University of Massachusetts

I-44 Fall Armyworm, *Spodoptera frugiperda*, caterpillar and ear damage. 1.7–34.2 mm



Jim Dill, University of Maine

I-45 Flea Beetle, Corn, *Chaetocnema pulicaria*, adult.
1.6–2.1 mm



Carlyn Andersen, University of Massachusetts

I-46 Flea Beetle, Crucifer, *Phyllotreta cruciferae*, adult.
2.2 mm



Ruth Hazzard, University of Massachusetts

I-47 Flea Beetle, Crucifer, *Phyllotreta cruciferae*, damage on cabbage.



Jude Boucher, University of Connecticut

I-48 Flea Beetle, Eggplant, *Epitrix fuscula*, adult. 2 mm



J. Ogradnick, Cornell University

I-49 Flea Beetle, Striped, *Phyllotreta striolata*, adult.
2–2.4 mm



Whitney Cranshaw, Colorado State University

I-50 Fungus Gnat, Darkwinged, *Bradysia* spp., adult.
2.5 mm



Whitney Cranshaw, Colorado State University

I-51 Fungus Gnat, Darkwinged, *Bradysia* spp., larvae stage. Up to 5.5 mm



Thomas Kuhar, Virginia Tech

I-52 Harlequin Bug, *Murgantia histrionica*, adults, mating pair. 8–11.5 mm



Thomas Kuhar, Virginia Tech

I-53 Harlequin Bug, *Murgantia histrionica*, nymphs.



Ruth Hazzard, University of Massachusetts

I-54 Hornworm, Tomato, *Manduca quinquemaculata*, caterpillar, covered with cocoon of Braconid wasp parasite. 6.7–81.3 mm



Jude Boucher, University of Connecticut

I-55 Imported Cabbageworm, *Pieris rapae*, adult butterfly. Wingspan 44 mm



Whitney Cranshaw, Colorado State University

I-56 Imported Cabbageworm, *Pieris rapae*, egg on broccoli leaf. Eggs are laid singly on top or underside of leaves. 0.5–1 mm



David N. Ferro, University of Massachusetts

I-57 Imported Cabbageworm, *Pieris rapae*, partly and full grown caterpillars on cabbage. 3.2–30.1 mm



Jim Dill, University of Maine

I-58 Japanese Beetle, *Popillia japonica*, adult. 8–11 mm



David Cappart, www.ipmimages.org

I-59 Japanese beetle, *Popillia japonica*, grub (left, 1.5 - 32 mm), compared to European chafer, *Rhizotrogus majalis* (center) and Junebug, *Phyllophaga* sp.(right).



Casey Hoy, Ohio State University

I-60 Leafhopper, Aster, *Macrosteles quadralineatis*, adult and nymphs. 3.5–3.8 mm (adult)



J. Ogradnick, Cornell University

I-61 Leafhopper, Potato, *Empoasca fabae*, adult. 3.5 mm



Ruth Hazzard, University of Massachusetts

I-62 Leafhopper, Potato, *Empoasca fabae*, symptoms of 'hopperburn' in potato.



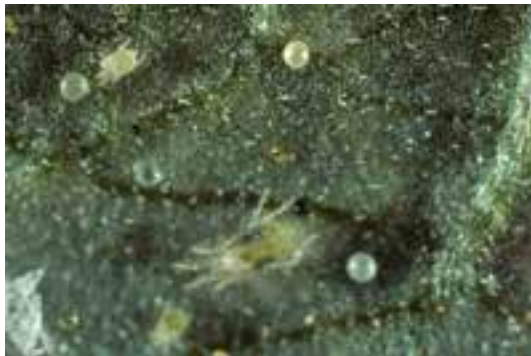
Ruth Hazzard, University of Massachusetts

I-63 Leafhopper, Potato, *Empoasca fabae*, symptoms of 'hopperburn' in snap bean.



Ruth Hazzard, University of Massachusetts

I-64 Leafminer, Beet, *Pegomya betae*, maggot exposed in feeding tunnel, on beet leaf. Up to 5–7 mm



David N. Ferro, University of Massachusetts

I-67 Mite, Twospotted Spider, *Tetranychus urticae*, adult, egg, and nymph. 0.4–0.5 mm (adult)



David N. Ferro, University of Massachusetts

I-70 Onion Maggot, *Delia antiqua*, adult fly, pupae and larvae. 6 mm (adult), up to 10 mm (maggot)



Whitney Cranshaw, Colorado State University

I-65 Leafminer, Vegetable, *Liriomyza sativae*, damage to bean leaves.



Jude Boucher, University of Connecticut

I-68 Mite, Twospotted Spider, *Tetranychus urticae*, feeding injury on eggplant.



Ruth Hazzard, University of Massachusetts

I-71 Oriental Beetle, *Exomala orientalis* adult. 9–10.3 mm



Clemson University - USDA Cooperative Extension Slide Series, www.insectimages.org

I-66 Mexican Bean Beetle, *Epilachna varivestis*, adult, eggs, larva and pupa with feeding injury, on bean. 6–8 mm (adult), 6–9.5 mm (larvae)



Michael Hoffman, Cornell University

I-69 Northern Corn Rootworm, *Diabrotica barberi*, adult. 6 mm



Jude Boucher, University of Connecticut

I-72 Pepper Maggot, *Zonosemata electa*, adult fly. 6.5 mm (male), 7.5 mm (female)



Jude Boucher, University of Connecticut

I-73 **Pepper Maggot**, *Zonosemata electa*, maggot feeding inside pepper fruit. Up to 10–12 mm



Becky Grube, University of New Hampshire

I-74 **Pepper Maggot**, *Zonosemata electa*, 'oviposition stings,' damage to fruit from egg laying by female maggot flies.



Paul McLeod, University of Arkansas

I-75 **Pepper Weevil**, *Anthonomus eugenii*, adult. 2–3.5 mm



Paul McLeod, University of Arkansas

I-76 **Pepper Weevil**, *Anthonomus eugenii*, larva. 1–5 mm



Thomas Kuhar, Virginia Tech

I-77 **Saltmarsh Caterpillar**, *Estigmene acrea*, caterpillar. 2–50 mm



Keith Weller, USDA-ARS, www.jpimages.org

I-78 **Sap Beetle, Dusky**, *Carpophilus lugubris*, adult. 3.5–4.5 mm



James Kalish, University of Nebraska-Lincoln

I-79 **Sap Beetle, Fourspotted**, *Glischrochilus quadrisignatus*, adult. Also known as picnic beetle. 5–6 mm



James Kalish, University of Nebraska-Lincoln

I-80 **Sap Beetle, Fourspotted**, *Glischrochilus quadrisignatus*, larva. Feeds in corn kernels. Up to 5–6 mm



Martin Spellman

I-81 **Seedcorn Maggot**, *Delia platura*, maggot feeding inside seed. 5–8 mm

Insects



Jude Boucher, University of Connecticut

I-82 Slug, Grey Garden, *Deroceras reticulatum*, on cabbage.



Jude Boucher, University of Connecticut

I-83 Slug, Grey Garden, *Deroceras reticulatum*, feeding damage on cabbage.



Martin Spellman

I-84 Soybean Looper, *Pseudoplusia includens*, caterpillar. Up to 35 mm



Chery Smith, University of New Hampshire

I-85 Spotted Wing Drosophila, *Drosophila suzukii*, adults. Female, top; male, bottom. Males have a distinctive spot on each wing. 2-3 mm



Chery Smith, University of New Hampshire

I-86 Spotted Wing Drosophila, *Drosophila suzukii*, female ovipositor. Note double, serrated edge.



Eric Sideman, Maine Organic Farmers and Gardeners Assoc.

I-87 Spotted Wing Drosophila, *Drosophila suzukii*, adults on crack in tomato fruit.



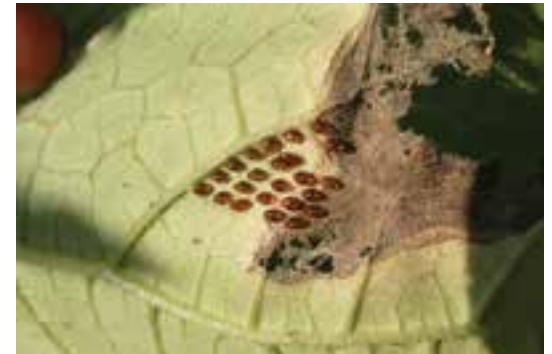
Ruth Hazzard, University of Massachusetts

I-88 Spotted Wing Drosophila, *Drosophila suzukii*, larvae in tomato fruit.



Ruth Hazzard, University of Massachusetts

I-89 Squash Bug, *Anasa tristis*, adult. 16 mm



Ruth Hazzard, University of Massachusetts

I-90 Squash Bug, *Anasa tristis*, egg mass on pumpkin leaf. 1.1-1.5 mm



Ruth Hazzard, University of Massachusetts

I-91 Squash Bug, *Anasa tristis*, nymphs. 2.5–10 mm



Alan Eaton, University of New Hampshire

I-92 Squash Vine Borer, *Melittia cucurbitae*, adult moth. Wingspan 25–37 mm



Jude Boucher, University of Connecticut

I-93 Squash Vine Borer, *Melittia cucurbitae*, caterpillar and damage inside squash stem. Up to 25 mm



Martin Spellman

I-94 Stalk Borer, Common, *Papaipema nebris*, caterpillar. Up to 27 mm



Ruth Hazzard, University of Massachusetts

I-95 Stink Bug, *Euschistus* spp., feeding injury on tomato fruit.



Kathy Kamminga, Virginia Tech

I-96 Stink Bug, Brown, *Euschistus servus*, adult. 10–15 mm



Martin Spellman

I-97 Stink Bug, Green, *Acrosternum hilare*, adult. 15 mm



Alan Eaton, University of New Hampshire

I-98 Stink Bug, Brown Marmorated, *Halyomorpha halys*, adult. The next to last (4th) antennal segment has a white band; abdominal segments alternate white and dark edge. 17mm



Julie Kikkert, Cornell University

I-99 Swede Midge, *Contarinia nasturtii*, damage.



Rebecca Hallet, University of Guelph, CAN

I-100 Swede Midge, *Contarinia nasturtii*, larvae and damage. 0.3–3.4 mm



J. Ogradnick, Cornell University

I-103 Thrips, Onion, *Thrips tabaci*, adult. 1–1.2 mm



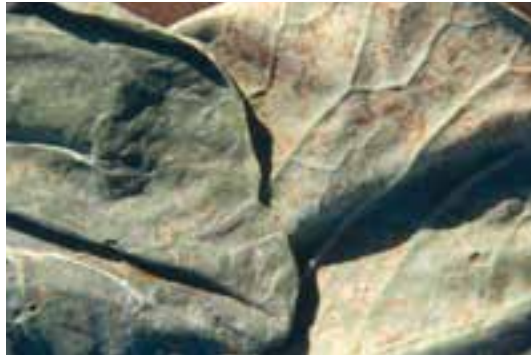
John Sanderson, Cornell University

I-106 Thrips, Western Flower, *Frankliniella occidentalis*, on yellow sticky card with fungus gnat. 1.2–1.9 mm (adult)



Louis Tedders, USDA-ARS, www.ipmimages.org

I-101 Tarnished Plant Bug, *Lygus* spp., adult. 4.9–5.95 mm



Ruth Hazzard, University of Massachusetts

I-104 Thrips, Onion, *Thrips tabaci*, damage on collard leaf



John Sanderson, Cornell University

I-107 Thrips, Western Flower, *Frankliniella occidentalis*, close-up of thrips larvae. <1 mm



Scott Bauer, USDA-ARS

I-102 Tarnished Plant Bug, *Lygus* spp., nymph. 1– 4.5 mm



Ruth Hazzard, University of Massachusetts

I-105 Thrips, Onion, *Thrips tabaci*, damage on onion.



Thomas Kuhar, Virginia Tech

I-108 Tomato Fruitworm, *Helicoverpa zea*, caterpillar and damage on tomato. Same species as Corn Earworm. 1.5–24.8 mm



Alton Sparks, University of Georgia

I-109 Tomato Pinworm, *Keiferia lycopersicella*, caterpillar. 0.7–8 mm



Jude Boucher, University of Connecticut

I-110 Tortoise beetle, Clavate, *Plagiometriona clavata*, adult. 5-7 mm



Jude Boucher, University of Connecticut

I-111 Tortoise beetle, Clavate, *Plagiometriona clavata*, larva.



Martin Spellman

I-112 True Armyworm, *Pseudaletia unipunctata*, caterpillars. Also called Common Armyworm or simply, Armyworm. Up to 35 mm



Martin Spellman

I-113 Webworm, Garden, *Achyra rantalis*, caterpillar. 2.1–20 mm



Martin Spellman

I-114 Webworm, Hawaiian Beetle, *Spoladea recurvalis*, caterpillar (left), along with Garden Webworm (right). Up to 25 mm



Martin Spellman

I-115 Western Corn Rootworm, *Diabrotica vergifera*, adult. 6 mm



David N. Ferro, University of Massachusetts

I-116 Whitefly, Greenhouse, *Trialeurodes vaporariorum*, adult and nymphs. 1–2 mm (adult), 0.3–0.75 mm (nymphs)



David N. Ferro, University of Massachusetts

I-117 Wireworm, *Melanotus* spp, adult, also known as 'click beetle.' 7–11 mm



Martin Spellman

I-118 Wireworm, *Melanotus* spp., larva. 1.5–19 mm



ipmimages.org

I-119 Insidious Flower Bug (beneficial insect), *Orius insidiosus*, feeding on aphid. Common in corn. 3 mm



ipmimages.org

I-120 Ladybeetle (beneficial insect), Family: *Coccinellidae*, larva feeding on aphids. Up to 5–6 mm



ipmimages.org

I-121 Ladybeetle, Multicolored Asian (beneficial insect), *Harmonia axyridis*, adult beetles showing a range marking color. 6 mm



Martin Spellman

I-122 Ladybeetle, Twelve Spotted (beneficial insect), *Coleomegilla maculata*, adult. Preys on insect eggs and small larvae, including Colorado potato beetle and aphids. 5.5 mm



Martin Spellman

I-123 Spined Soldier Bug (beneficial insect), *Podisus maculiventris*, adult. Preys on insect eggs and larvae. 8.5–13 mm



Martin Spellman

I-124 Syrphid Fly larva (beneficial insect). Aphid predator; immature of Hover fly 1–13 mm



Low Resolution Photo - Replace

Alan Eaton, University of New Hampshire

I-125 Predatory Midge (beneficial insect), *Aphidoletes aphidimyza*, larva. Aphid predator. 2–3mm



Roy Van Driesche, University of Massachusetts

I-126 Parasite of imported cabbageworm (beneficial insect), *Cotesia rubecula*, ICW caterpillars with cocoon of *C. rubecula*. 3–4mm

Diseases & Disorders



Melvyn L. Lacy, Michigan State University,

D-1 Alliums, Downy Mildew - Sporulation of the oomycete *Peronospora destructor* on onion foliage.



Wade Elmer, Connecticut Agriculture Experiment Station

D-4 Asparagus, Fusarium Wilt - Fusarium wilt of asparagus caused by the fungi *Fusarium oxysporum* and *F. proliferatum*.



Robert L. Wick, University of Massachusetts

D-7 Basil, Downy Mildew - Dark sporulation on underside of basil leaf caused by the oomycete *Peronospora belbahrii*.



Melvyn L. Lacy, Michigan State University,

D-2 Alliums, Leaf Blight - Small white lesions with haloes caused by *Botrytis squamosa* on onion foliage.



Dennis Johnson

D-5 Asparagus, Rust - Rust pustules of the fungus *Puccinia asparagi* on Asparagus fern tissue.



Jude Boucher, University of Connecticut

D-8 Basil, Downy Mildew - Yellowing of foliage caused by infection with the oomycete *Peronospora belbahrii*.



C. Andrew Wyenandt, Rutgers

D-3 Alliums, Purple Blotch - Oblong, purplish lesions caused by the fungus *Alternaria porri* on leek foliage.



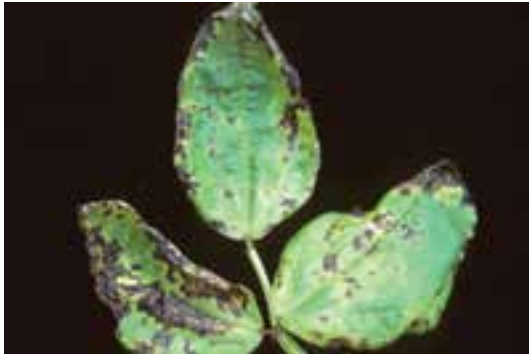
Robert L. Wick, University of Massachusetts

D-6 Basil, Downy Mildew - Yellowing of foliage caused by infection with the oomycete *Peronospora belbahrii*.



Robert L. Wick, University of Massachusetts

D-9 Bean, Anthracnose - Anthracnose caused by the fungus *Colletotrichum lindemuthianum* on green beans.



Robert L. Wick, University of Massachusetts

D-10 Bean, Bacterial Blight - Leaf blight caused by the bacterium *Pseudomonas syringae*.



Jude Boucher, University of Connecticut

D-13 Bean, Phytophthora Blight - Diffuse, white mycelia of the oomycete *Phytophthora capsici* on bean pods.



James G. Kantzes, University of Maryland

D-16 Bean, Rhizoctonia Root Rot - Root rot caused by the fungus *Rhizoctonia solani*.



James G. Kantzes, University of Maryland

D-11 Bean, Brown Spot - Leaf spots caused by the bacterium *Pseudomonas syringae* pv. *syringae*.



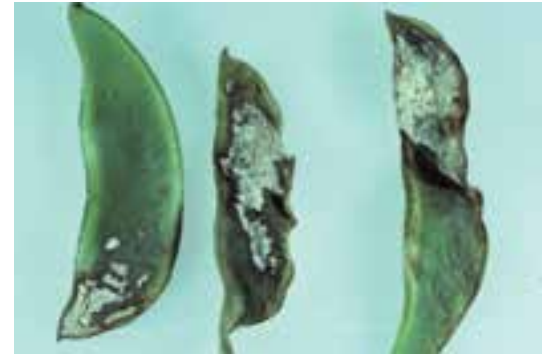
Jude Boucher, University of Connecticut

D-14 Bean, Phytophthora Blight - Crown rot and plant collapse caused by the oomycete *Phytophthora capsici* in a bean field.



Robert L. Wick, University of Massachusetts

D-17 Bean, Root and Crown Rot - Root and crown rot caused by the fungus *Thielaviopsis basicola*.



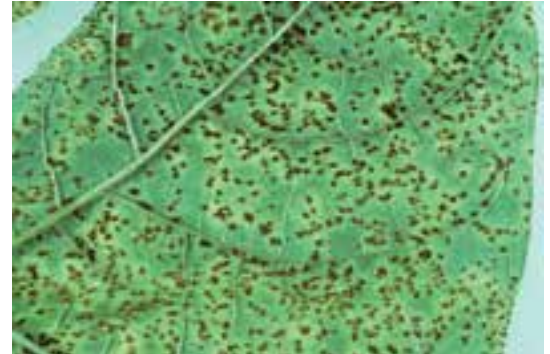
Robert L. Wick, University of Massachusetts

D-12 Bean, Downy Mildew - Symptoms of downy mildew caused by the oomycete *Phytophthora phaseoli* on Lima bean pods.



Robert Mulrooney, University of Delaware

D-15 Bean, Phytophthora Blight - White sporangia of *Phytophthora capsici* on surface of lima bean pod.



Robert L. Wick, University of Massachusetts

D-18 Bean, Rust - Rust pustules caused by the fungus *Uromyces phaseoli* on bean.



Robert L. Wick, University of Massachusetts

D-19 Bean, Virus - Symptoms of a viral infection on bean foliage.



Jude Boucher, University of Connecticut

D-22 Brassicas, Alternaria Leaf Spot - Target-like lesion caused by the fungus *Alternaria brassicicola* on cabbage leaf.



Robert L. Wick, University of Massachusetts

D-25 Brassicas, Alternaria Leaf Spot - Dark spots with yellow haloes on radish foliage caused by one of three species of *Alternaria* fungi.



Robert L. Wick, University of Massachusetts

D-20 - Bean, White Mold - White, fluffy mycelia and black sclerotia produced by the fungus *Sclerotinia sclerotiorum* on green bean pods.



D-23 Brassicas, Alternaria Leaf Spot - Dark, concentric-ringed lesions caused by the fungus *Alternaria brassicicola* on broccoli leaves.



Robert L. Wick, University of Massachusetts

D-26 Brassicas, Black Leg - Symptoms of black leg caused by the fungus *Phoma lignan* on stem and petiole of cabbage plant.



Robert L. Wick, University of Massachusetts

D-21 Beet, Phoma Leaf Spot - Symptoms of Phoma leaf spot caused by the fungus *Phoma lignan* on beet foliage.



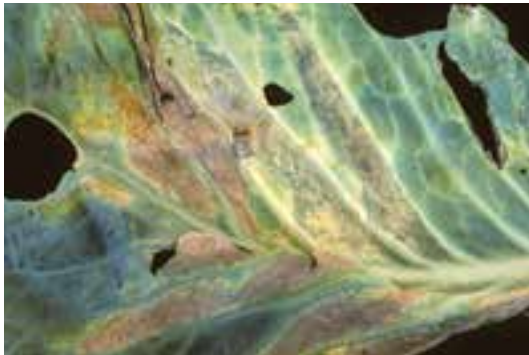
Robert L. Wick, University of Massachusetts

D-24 Brassicas, Alternaria Leaf Spot - Brown to black rot of curds caused by the fungus *Alternaria brassicicola* on broccoli head.



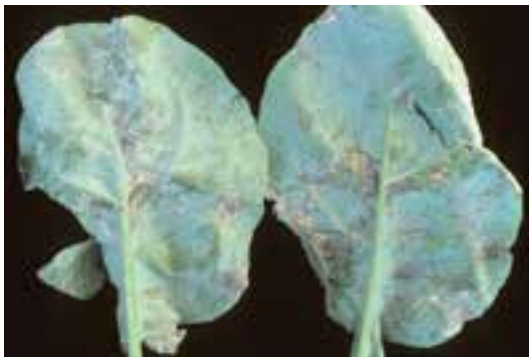
Jude Boucher, University of Connecticut

D-27 Brassicas, Black Rot - V-shaped lesions on leaf margins caused by the bacterium *Xanthomonas campestris* pv. *campestris* on cabbage plant.



Robert L. Wick, University of Massachusetts

D-28 Brassicas, Black Rot - Black discoloration of veins caused by the bacterium *Xanthomonas campestris* pv. *campestris* on broccoli leaf.



Robert L. Wick, University of Massachusetts

D-31 Brassicas, Downy Mildew - Symptoms of downy mildew caused by the oomycete *Peronospora parasitica* on underside of broccoli leaves.



John Howell, University of Massachusetts

D-34 Brassicas, Tip Burn - Symptoms of tip burn caused by calcium deficiency on cabbage.



John Howell, University of Massachusetts

D-29 Brassicas, Boron Deficiency - Hollow stem symptoms on cauliflower caused by boron deficiency.



Robert L. Wick, University of Massachusetts

D-32 Brassicas, Downy Mildew - Symptoms of downy mildew caused by the oomycete *Peronospora parasitica* on collard leaves.



C. Andrew Wyenandt, Rutgers

D-35 Brassicas, White Mold - A water soaked lesion, white mycelia, and black sclerotia of the fungus *Sclerotinia sclerotiorum* on cabbage.



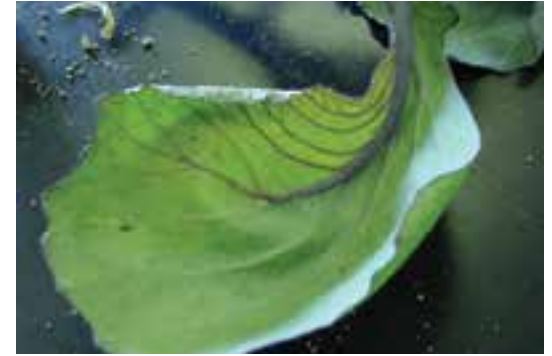
Robert L. Wick, University of Massachusetts

D-30 Brassicas, Clubroot - Symptoms of clubroot caused by the fungus *Plasmodiophora brassicae*.



Robert L. Wick, University of Massachusetts

D-33 Brassicas, Downy Mildew - Symptoms of downy mildew caused by the oomycete *Peronospora parasitica* on broccoli head.



C. Andrew Wyenandt, Rutgers

D-036 Brassicas, Yellows - One-sided leaf chlorosis and distortion of cabbage leaf caused by one of two strains of *Fusarium oxysporum*.



Robert L. Wick, University of Massachusetts

D-37 Calabasa, Black Rot - Symptoms of black rot caused by the fungus *Didymella bryoniae* on calabasa fruit.



Robert L. Wick, University of Massachusetts

D-40 Carrot, Black Root Rot - Cankers caused by the fungus *Thielaviopsis basicola* on carrot roots.



Jude Boucher, University of Connecticut

D-43 Celery, Heart Rot - Leaf distortion caused by calcium deficiency.



Robert L. Wick, University of Massachusetts

D-38 Carrot, Alternaria Leaf Blight - Symptoms of leaf blight caused by the fungus *Alternaria dauci* on carrot foliage.



Robert L. Wick, University of Massachusetts

D-41 Carrot, Root-Knot Nematode - Symptoms of infection with the nematode *Meloidagyne hapla* on carrot roots.



Robert L. Wick, University of Massachusetts

D-44 Chard, Cercospora Leaf Spot - Leaf spots caused by the fungus *Cercospora beticola* on Swiss chard foliage.



Robert L. Wick, University of Massachusetts

D-39 Carrot, Bacterial Leaf Blight - Symptoms of leaf blight caused by the bacterium *Xanthomonas campestris* pv. *carotae*.



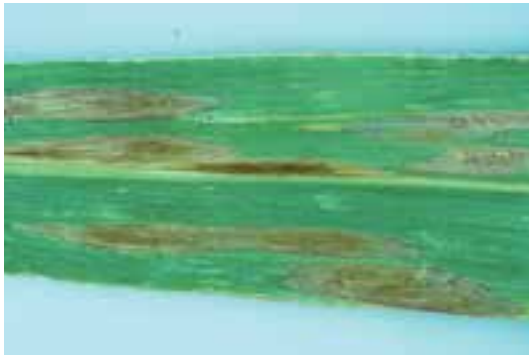
Jude Boucher, University of Connecticut

D-42 Celery, Heart Rot - Underdeveloped hearts caused by calcium deficiency can provide entry points for bacterial soft rot organisms.



Robert L. Wick, University of Massachusetts

D-45 Corn, Northern Corn Leaf Blight - Long, tan or grayish lesions running parallel to leaf margins caused by the fungus *Exserohilum turcicum*.



Robert L. Wick, University of Massachusetts

D-46 Corn, Northern Corn Leaf Blight - Long, narrow lesions with dark green-black sporulation by the fungus *Exserohilum turcicum*.



Robert L. Wick, University of Massachusetts

D-49 Corn, Stewart's Wilt - Wavy elongated, bleached tissue characteristic of Stewart's Wilt caused by the bacterium *Pantoea (Erwinia) stewartii*.



Jude Boucher, University of Connecticut

D-52 Cucurbits, Angular Leaf Spot - Shot-hole damage caused by severe infection by the bacterium *Pseudomonas syringae* pv. *lachrymans* on winter squash.



Robert L. Wick, University of Massachusetts

D-47 Corn, Rust - Rust pustules caused by the fungus *Puccinia sorghi* on corn leaf.



Robert L. Wick, University of Massachusetts

D-50 Corn, Stewart's Wilt - Young corn plant killed by the Stewart's Wilt bacterium *Pantoea (Erwinia) stewartii*.



Robert L. Wick, University of Massachusetts

D-53 Cucurbits, Anthracnose - Leaf spots on cucumber foliage caused by the fungus *Colletotrichum orbiculare*.



Robert L. Wick, University of Massachusetts

D-48 Corn, Smut - Corn smut caused by the fungus *Ustilago maydis* on corn ear.



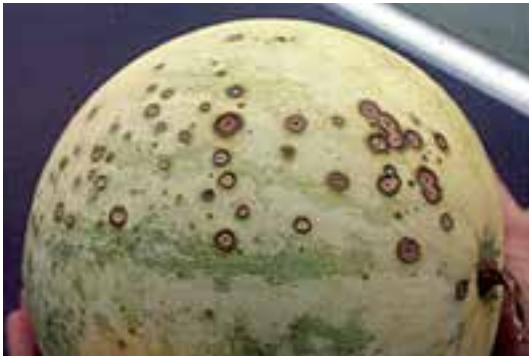
James G. Kantzes, University of Maryland

D-51 Cucurbits, Angular Leaf Spot - Angular, irregularly shaped leaf lesions with yellow haloes caused by the bacterium *Pseudomonas syringae* pv. *lachrymans* on cucumber.



Robert L. Wick, University of Massachusetts

D-54 Cucurbits, Anthracnose - Stem lesions on cucumber caused by the fungus *Colletotrichum orbiculare*.



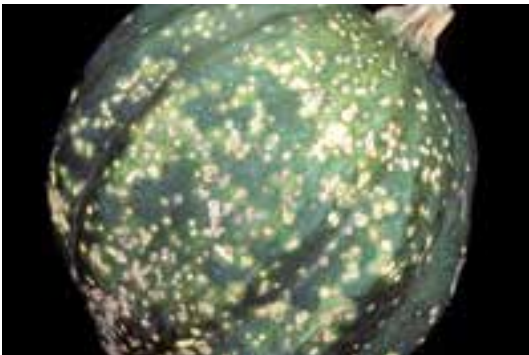
James G. Kantzes, University of Maryland

D-55 Cucurbits, Anthracnose - Fruit lesions caused by the fungus *Colletotrichum orbiculare* on watermelon. Under moist conditions salmon-colored sporulation is produced.



James G. Kantzes, University of Maryland

D-58 Cucurbits, Belly Rot - Sunken, brick-colored lesions on cucumber caused by the fungus *Rhizoctonia solani*.



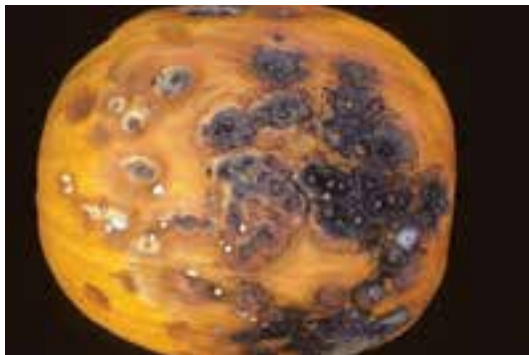
Robert L. Wick, University of Massachusetts

D-61 Cucurbits, Black Rot - Lesions caused by the fungus *Didymella bryoniae* on acorn squash fruit.



James G. Kantzes, University of Maryland

D-56 Cucurbits, Bacterial Fruit Blotch - Large, olive-green discoloration of watermelon fruit caused by the bacterium *Acidovorax citrulli*.



Robert L. Wick, University of Massachusetts

D-59 Cucurbits, Black Rot - Lesions caused by the fungus *Didymella bryoniae* on pumpkin fruit.



Robert L. Wick, University of Massachusetts

D-62 Cucurbits, Black Rot - Lesions caused by the fungus *Didymella bryoniae* on butternut fruit.



Jude Boucher, University of Connecticut

D-57 Cucurbits, Bacterial Wilt - Symptoms on cucumber caused by the bacterium *Erwinia tracheiphila*.



James G. Kantzes, University of Maryland

D-60 Cucurbits, Black Rot - Lesions caused by the fungus *Didymella bryoniae* on winter squash fruit.



Jude Boucher, University of Connecticut

D-63 Cucurbits, Deer Damage - Damage to pumpkin caused by deer feeding



James G. Kantzes, University of Maryland

D-64 Cucurbits, Downy & Powdery Mildews - Sporulation of powdery mildew (white) and downy mildew (brown) on underside of muskmelon leaf.



Kathryne L. Everts, Univ. MD and Univ. DE

D-67 Cucurbits, Downy Mildew - Symptoms on watermelon caused by the oomycete *Pseudoperonospora cubensis*.



Robert L. Wick, University of Massachusetts

D-70 Cucurbits, Fruit Rot - Secondary rot of pumpkin fruit caused by fungi in the genera *Alternaria* and *Fusarium*.



C. Andrew Wyenandt, Rutgers

D-65 Cucurbits, Downy Mildew - Angular lesions with dark sporulation on leaf undersides caused by the oomycete *Pseudoperonospora cubensis* on cucumber.



Robert L. Wick, University of Massachusetts

D-68 Cucurbits, Downy Mildew - Symptoms in winter squash field caused by the oomycete *Pseudoperonospora cubensis*.



Wade Elmer, CT Agriculture Experiment Station

D-71 Cucurbits, Fusarium Rot - Lesions on pumpkin fruit caused by fungi in the genus *Fusarium*.



Robert L. Wick, University of Massachusetts

D-66 Cucurbits, Downy Mildew - Early symptoms on underside of winter squash leaf caused by the oomycete *Pseudoperonospora cubensis*.



John Howell, University of Massachusetts

D-69 Cucurbits, Fruit Abortion - Squash fruit abortion caused by lack of pollination.



James G. Kantzes, University of Maryland

D-72 Cucurbits, Fusarium Wilt - Wilt symptoms with stem necrosis and oozing caused by the fungus *Fusarium oxysporum* f. sp. *melonis* on muskmelon.



Franklin Schales, University of Maryland,

D-73 Cucurbits, Fusarium Wilt - Wilt symptoms caused by the fungus *Fusarium oxysporum* f. sp. *niveum* on watermelon plant.



Keith Burnell, Syngenta, Inc.

D-76 Cucurbits, Gummy Stem Blight - Pycnidia (fungal fruiting structures) of the fungus *Didymella bryoniae* on stems of watermelon.



Jude Boucher, University of Connecticut

D-79 Cucurbits, Ozone Injury - Yellowing or bleaching of interveinal leaf tissue caused by excessive ozone in the atmosphere.



Wade Elmer, CT Agricultural Experiment Station

D-74 Cucurbits, Fusarium Wilt - Symptoms on vines of pumpkin plants caused by *Fusarium solani* f. sp. *cucurbitae*.



James G. Kantzes, University of Maryland

D-77 Cucurbits, Leaf Blight - Circular brown spots with tan to white centers on muskmelon foliage caused by the fungus *Alternaria cucumerina*.



Kathryne L. Everts, Univ. MD and Univ. DE

D-80 Cucurbits, Phytophthora Blight - Symptoms of fruit rot caused by the oomycete *Phytophthora capsici* on watermelon.



James G. Kantzes, University of Maryland

D-75 Cucurbits, Gummy Stem Blight - Foliar phase of Black rot caused by the fungus *Didymella bryoniae* on watermelon leaf.



Gerald E. Brust, University of Maryland

D-78 Cucurbits, Manganese Toxicity - Small lesions with water-soaked edges caused by manganese toxicity pictured on muskmelon.



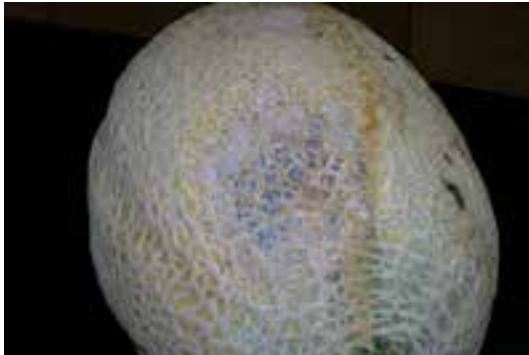
Robert L. Wick, University of Massachusetts

D-81 Cucurbits, Phytophthora Blight - Fruit rot symptoms caused by the oomycete *Phytophthora capsici* on pumpkin.



Robert L. Wick, University of Massachusetts

D-82 Cucurbits, Phytophthora Blight - Crown rot and plant collapse of summer squash caused by the oomycete *Phytophthora capsici*.



Kathryne L. Everts, Univ. MD and Univ. DE

D-85 Cucurbits, Phytophthora Blight - Water-soaked lesions with white sporulation of the oomycete *Phytophthora capsici* on muskmelon.



Jude Boucher, University of Connecticut

D-88 Cucurbits, Plectosporium - Lesions on pumpkin fruit caused by the fungus *Plectosporium tabacinum*.



Robert L. Wick, University of Massachusetts

D-83 Cucurbits, Phytophthora Blight - Fruit rot symptoms on summer squash caused by the oomycete *Phytophthora capsici*.



Jude Boucher, University of Connecticut

D-86 Cucurbits, Plectosporium - Lesions on summer squash vines caused by the fungus *Plectosporium tabacinum*.



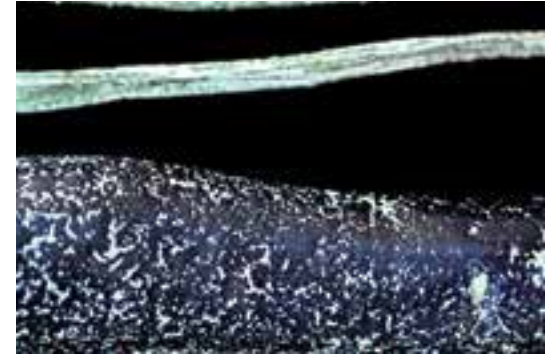
Jude Boucher, University of Connecticut

D-89 Cucurbits, Plectosporium - Severe infection of pumpkin fruit by the fungus *Plectosporium tabacinum*.



C. Andrew Wyenandt, Rutgers

D-84 Cucurbits, Phytophthora Blight - Dense, white sporulation of the oomycete *Phytophthora capsici* on cucumber fruit.



Robert L. Wick, University of Massachusetts

D-87 Cucurbits, Plectosporium - White, scabby lesions on zucchini fruit and stem caused by the fungus *Plectosporium tabacinum*.



Robert L. Wick, University of Massachusetts

D-90 Cucurbits, Powdery Mildew - White sporulation on upper and lower leaf surfaces of cucumber caused by the oomycetes *Podosphaera xanthii* and *Erysiphe cichoracearum*.

Diseases & Disorders



C. Andrew Wyenandt, Rutgers

D-91 Cucurbits, Powdery Mildew - White, sporulating lesions on pumpkin leaf caused by the oomycetes *Podosphaera xanthii* and *Erysiphe cichoracearum*.



Jude Boucher, University of Connecticut

D-94 Cucurbits, Scab - Leaf lesions caused by the fungus *Cladosporium cucumerinum* infecting summer squash.



Robert L. Wick, University of Massachusetts

D-97 Cucurbits, Septoria Leaf Spot - Leaf lesions caused by the fungus *Septoria cucurbitacearum* on cucumber.



Robert L. Wick, University of Massachusetts

D-92 Cucurbits, Powdery Mildew - Symptoms on foliage of winter squash caused by the oomycetes *Podosphaera xanthii* and *Erysiphe cichoracearum*.



Jude Boucher, University of Connecticut

D-95 Cucurbits, Scab - Fruit lesions caused by *Cladosporium cucumerinum* on summer squash.



James G. Kantzes, University of Maryland

D-93 Cucurbits, Pythium Cottony Leak - White, fluffy mycelial growth of oomycetes in the genus *Pythium* on cucumber fruit.



James G. Kantzes, University of Maryland

D-96 Cucurbits, Scab - Sunken, oozing lesions caused by the fungus *Cladosporium cucumerinum* on cucumber fruit.



C. Andrew Wyenandt, Rutgers

D-98 Cucurbits, Virus - Symptoms of a mosaic virus on pumpkin foliage.



Robert L. Wick, University of Massachusetts

D-99 Cucurbits, Virus - Mottling and distortion caused by Zucchini Yellow Mosaic Virus (ZYMV).



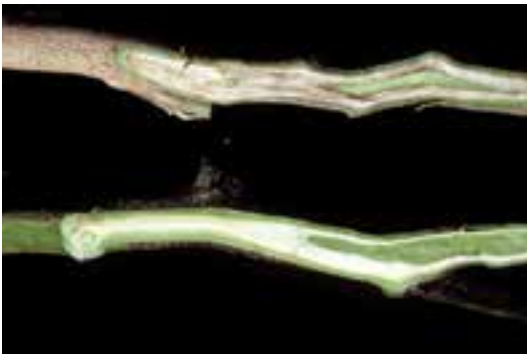
John Howell, University of Massachusetts

D-100 Cucurbits, Wind Burn - Injury to cucumber leaves caused by excessive wind.



C. Andrew Wyenandt, Rutgers

D-103 Eggplant, Phytophthora Blight - Crown rot symptoms caused by the oomycete *Phytophthora capsici* on eggplant.



Robert L. Wick, University of Massachusetts

D-106 Eggplant, Verticillium Wilt - Healthy (lower) and symptomatic stem tissue (upper) showing vascular discoloration caused by the fungi *Verticillium dahliae* and *V. albo-atrum*.



Jude Boucher, University of Connecticut

D-101 Cucurbits, Woodchuck Damage - Damage to pumpkin caused by woodchuck feeding.



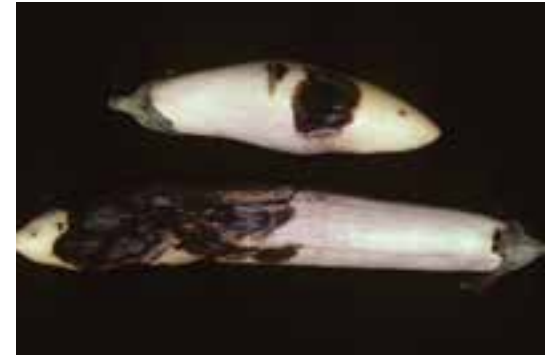
Jude Boucher, University of Connecticut

D-104 Eggplant, Pythium Cottony Leak - Fruit rot of eggplant caused by oomycetes in the genus *Pythium*.



Bruce Watt, University of Maine

D-107 Garlic, Bloat Nematode - Yellowed leaves and dry rot of basal plate caused by infection with the nematode *Ditylenchus dipsaci*.



Robert L. Wick, University of Massachusetts

D-102 Eggplant, Anthracnose - Sunken, dark lesions caused by *Colletotrichum* on eggplant fruit.



Jude Boucher, University of Connecticut

D-105 Eggplant, Verticillium Wilt - Symptoms of Verticillium wilt on eggplant foliage.



C. Andrew Wyenandt, Rutgers

D-108 Lettuce, Bottom Rot - Sunken, reddish-brown lesions on leaf petioles and midribs caused by the fungus *Rhizoctonia solani*.



Robert L. Wick, University of Massachusetts

D-109 Lettuce, Septoria Blight - Brown, necrotic lesions with yellow halos and black pycnidia in their centers are caused by the fungus *Septoria lactucae*.



C. Andrew Wyenandt, Rutgers

D-112 Parsley, Septoria Leaf Spot - Tan lesions with dark pycnidia in their centers caused by the fungus *Septoria petroselinii*.



Robert L. Wick, University of Massachusetts

D-115 Parsnip, Leaf Blight - Symptoms of leaf blight of parsnip caused by *Rhizoctonia* spp. and *Ascochyta* spp. fungi.



John Howell, University of Massachusetts

D-110 Lightning - Dead area in a pepper field caused by a lightning strike.



Robert L. Wick, University of Massachusetts

D-113 Parsnip, Bacterial Soft Rot - Vascular discoloration caused by the bacterium *Pseudomonas marginalis*.



James G. Kantzes, University of Maryland

D-116 Pea, Bacterial Blight - Angular leaf lesions caused by the bacterium *Pseudomonas syringae* pv. *pisi*



Robert L. Wick, University of Massachusetts

D-111 Okra, Verticillium Wilt - Yellowing, wilt, and plant collapse caused by the fungus *Verticillium dahliae*.



Robert L. Wick, University of Massachusetts

D-114 Parsnip, Itersonia Blight - Symptoms of Itersonia blight caused by the fungus *Itersonia perplexans* on parsnip roots.



James G. Kantzes, University of Maryland

D-117 Pea, Leaf and Pod Spot - Tan sunken lesions caused by the fungus *Ascochyta pisi* on pea pods.



Robert L. Wick, University of Massachusetts

D-118 Pea, Rhizoctonia Root Rot - Symptoms of root rot on pea caused by the fungus *Rhizoctonia solani*.



Jude Boucher, University of Connecticut

D-121 Pepper, Bacterial Soft Rot - Soft rot of pepper fruit caused by bacteria in the genus *Erwinia*.



Jude Boucher, University of Connecticut

D-124 Pepper, Bacterial Spot - Symptoms on pepper fruit caused by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



Robert L. Wick, University of Massachusetts

D-119 Pepper, Anthracnose - Sunken, dark lesions characteristic of the fungus *Colletotrichum coccodes* on ripe pepper fruit.



Jude Boucher, University of Connecticut

D-122 Pepper, Bacterial Spot - Leaf spots on pepper foliage caused by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



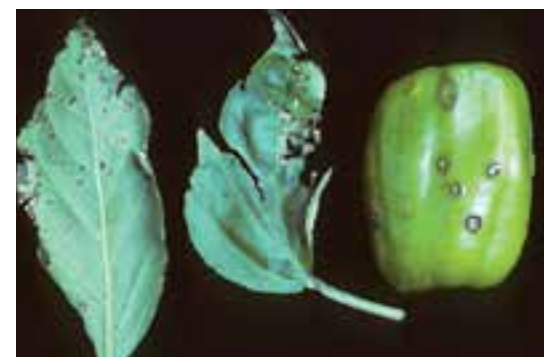
Jude Boucher, University of Connecticut

D-125 Pepper, Bacterial Spot - Leaf drop of pepper caused by infection by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



Robert L. Wick, University of Massachusetts

D-120 Pepper, Anthracnose - Sunken lesions on fruit of all stages develop salmon-colored sporulation of the fungus *Colletotrichum acutatum*.



Robert L. Wick, University of Massachusetts

D-123 Pepper, Bacterial Spot - Symptoms on foliage and fruit caused by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



Robert L. Wick, University of Massachusetts

D-126 Pepper, Cucumber Mosaic Virus - CMV symptoms on pepper fruit.



Robert L. Wick, University of Massachusetts

D-127 Pepper, Impatiens Necrotic Spot Virus - Ringspots on pepper foliage caused by INSV.



Robert L. Wick, University of Massachusetts

D-130 Pepper, Root-Knot Nematode - Galls on pepper roots caused by the nematode *Meloidagynes hapla*.



James G. Kantzes, University of Maryland

D-133 Potato, Early Blight - Target-like lesions on leaf tissue caused by the fungus *Alternaria solani*.



Robert L. Wick, University of Massachusetts

D-128 Pepper, Phytophthora Blight - Crown rot of pepper caused by the oomycete *Pytophthora capsici* resulting in plant collapse.



Jude Boucher, University of Connecticut

D-131 Pepper, Sunscald - Injury to pepper fruit caused by excessive exposure to sunlight.



Robert L. Wick, University of Massachusetts

D-129 Pepper, Root-Knot Nematode - Stunting of pepper plants caused by root infection by the nematode *Meloidagynes hapla*.



Jude Boucher, University of Connecticut

D-132 Pepper, Sunscald - *Alternaria alternata*, a weak fungal pathogen, commonly infects fruit that has been injured by sunscald causing blackening.



James G. Kantzes, University of Maryland

D-134 Potato, Late Blight - Brown, water-soaked leaf lesions caused by the oomycete *Phytophthora infestans* on potato foliage.



Robert L. Wick, University of Massachusetts

D-135 Potato, Scab - Symptoms of scab on potato tuber caused by the bacterium *Streptomyces scabies*.



James G. Kantzes, University of Maryland

D-136 Spinach, Anthracnose - Tan, necrotic lesions caused by the fungus *Colletotrichum dematium* f. sp. *spinaciae*.



Robert L. Wick, University of Massachusetts

D-139 Sweet Potato, Black Rot - Dark, firm lesions on sweet potato tubers caused by the fungus *Ceratocystis fimbriata*



Robert L. Wick, University of Massachusetts

D-142 Sweet Potato, Scurf - Gray-brown lesions on surface of sweet potato tubers caused by the fungus *Monochaetes infuscans*.



James G. Kantzes, University of Maryland

D-137 Spinach, Downy Mildew - Sporulation of *Peronospora farinosa* f. sp. *spinaciae* on the underside of spinach leaves.



James G. Kantzes, University of Maryland

D-140 Sweet Potato, Fusarium Wilt - Chlorotic, wilted plant infected with the fungus *Fusarium oxysporum* f. sp. *batatas*.



Robert L. Wick, University of Massachusetts

D-143 Tomato, Anthracnose - Sunken black lesions on tomato fruit caused by the fungus *Colletotrichum coccodes*.



Kathryne L. Everts, Univ. MD and Univ. DE

D-138 Spinach, White Rust - Chlorotic lesions caused by the fungus *Albugo occidentalis* on the upper leaf surface.



James G. Kantzes, University of Maryland

D-141 Sweet Potato, Pox - Soil rot causing sunken lesions and distortions on sweet potato tubers caused by the bacterium *Streptomyces ipomoeae*.



Robert L. Wick, University of Massachusetts

D-144 Tomato, Bacterial Canker - Wilt symptoms caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis*. Note wilting on one side of leaf, a characteristic early symptom.



Jude Boucher, University of Connecticut

D-145 Tomato, Bacterial Canker - Discoloration of vascular element of tomato stem infected with the bacterium *Clavibacter michiganensis* subsp. *michiganensis*.



Robert L. Wick, University of Massachusetts

D-148 Tomato, Bacterial Canker - "Bird's-eye" lesions on green tomato fruit caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis*.



Robert L. Wick, University of Massachusetts

D-151 Tomato, Bacterial Spot - Leaf spots caused by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



Robert L. Wick, University of Massachusetts

D-146 Tomato, Bacterial Canker - Stem canker with droplet of bacterial ooze in its center caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis*.



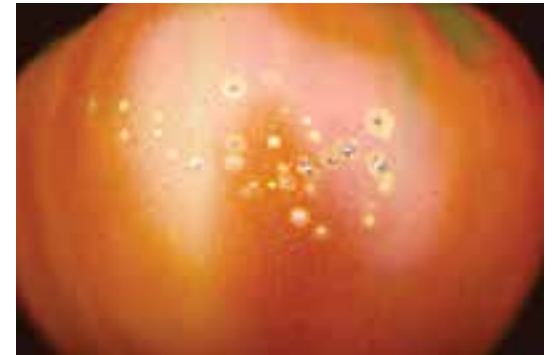
Robert L. Wick, University of Massachusetts

D-149 Tomato, Bacterial Diseases - Bacterial fruit spots on tomato. Clockwise from upper left: Bacterial Canker (*Clavibacter michiganensis* subsp. *michiganensis*), Bacterial Spot (*Xanthomonas campestris* pv. *vesicatoria*), Bacterial Speck (*Pseudomonas syringae* pv. *tomato*).



Robert L. Wick, University of Massachusetts

D-152 Tomato, Bacterial Spot - Brown, rough spots on tomato fruit caused by the bacterium *Xanthomonas campestris* pv. *vesicatoria*.



Robert L. Wick, University of Massachusetts

D-147 Tomato, Bacterial Canker - "Bird's-eye" lesions on ripe tomato fruit caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis*.



Robert L. Wick, University of Massachusetts

D-150 Tomato, Bacterial Speck - Small, black lesions on tomato fruit caused by the bacterium *Pseudomonas syringae* pv. *tomato*.



John Howell, University of Massachusetts

D-153 Tomato, Blossom End Rot - Fruit injury caused by calcium deficiency.



Diseases & Disorders



D-154 Tomato, Blotchy Ripening - Physiological disorder also known as Greywall caused by any environmental stress that slows plant growth.

John Howell, University of Massachusetts



D-157 Tomato, Early Blight - Brown-black leaf lesions with target-like appearance caused by the fungus *Alternaria solani*.

Robert L. Wick, University of Massachusetts



D-160 Tomato, Fruit Cracking - Concentric and radial cracks in tomato fruit caused by excessive moisture during fruit expansion.

John Howell, University of Massachusetts



D-155 Tomato, Catfacing - Fruit injury caused by cool temperatures (below 60°F) during flower bud initiation.

John Howell, University of Massachusetts



D-158 Tomato, Early Blight - Lesions caused by the fungus *Alternaria solani* develop in lower leaves and progresses upward over time.

Jude Boucher, University of Connecticut



D-161 Tomato, Fusarium Wilt - Vascular discoloration caused by the fungus *Fusarium oxysporum* f. sp. *Lycopersici*.

James G. Kantzes, University of Maryland



D-156 Tomato, Early Blight - Brown-black leaf lesions with target-like appearance caused by the fungus *Alternaria solani*.

Jude Boucher, University of Connecticut



D-159 Tomato, Fruit Cracking - Concentric and radial cracks in tomato fruit caused by excessive moisture during fruit expansion.

Jude Boucher, University of Connecticut



D-162 Tomato, Ghost Spot - Light, ring spots on tomato fruit caused by the fungus *Botrytis cinerea*.

Jude Boucher, University of Connecticut



Robert L. Wick, University of Massachusetts

D-163 Tomato, Late Blight - Dark brown-olive green, water soaked lesions caused by the oomycete *Phytophthora infestans*.



Robert L. Wick, University of Massachusetts

D-166 Tomato, Leaf Mold - Pale, yellow leaf spots caused by the fungus *Fulvia fulva*.



Robert L. Wick, University of Massachusetts

D-169 Tomato, Pitch Necrosis - Vascular discoloration, internal stem necrosis and adventitious roots form as a result of infection with the bacterium *Pseudomonas corrugata*.



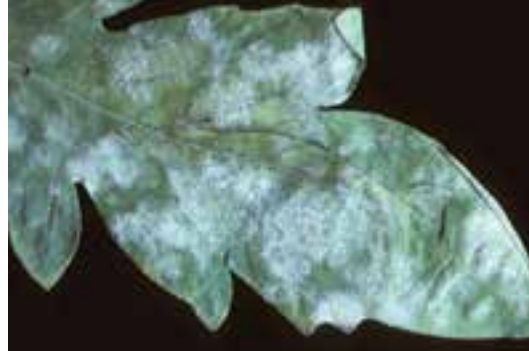
Robert L. Wick, University of Massachusetts

D-164 Tomato, Late Blight - Stem lesion caused by the oomycete *Phytophthora infestans*.



Robert L. Wick, University of Massachusetts

D-167 Tomato, Leaf Mold - Velvety, olive-green to brown spots on lower leaf surface caused by the fungus *Fulvia fulva*.



Robert L. Wick, University of Massachusetts

D-170 Tomato, Powdery Mildew - Small spots of white sporulation of the oomycete *Oidium neolycopersici* on tomato leaf.



Joan Allen, University of Connecticut

D-165 Tomato, Late Blight - Brown, water-soaked, firm fruit rot caused by the oomycete *Phytophthora infestans*.



Jude Boucher, University of Connecticut

D-168 Tomato, Phytophthora Blight - Brown, water-soaked, firm fruit rot known as "Buckeye Rot" caused by the oomycete *Phytophthora capsici*.



Robert L. Wick, University of Massachusetts

D-171 Tomato, Pythium Rot - Soft, watery rot with some white sporulation of oomycetes in the genus *Pythium*.



John Howell, University of Massachusetts

D-172 Tomato, Rain Check - Fine cracks that callus over on tomato fruit shoulders caused by excessive moisture.



John Howell, University of Massachusetts

D-175 Tomato, Stitching - Fine cracks that callus over on tomato fruit shoulders caused by cool temperatures during tomato flower bud initiation.



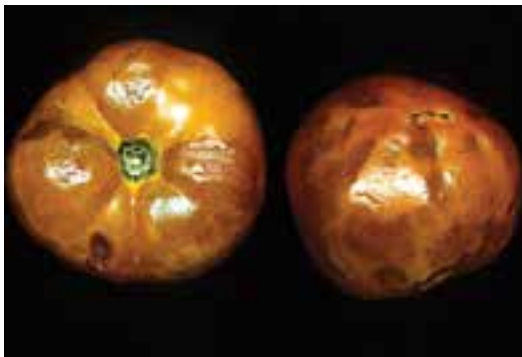
Robert L. Wick, University of Massachusetts

D-178 Tomato, Verticillium Wilt - Yellow blotches with brown veins on tomato foliage caused by the fungus *Verticillium albo-atrum*.



Jude Boucher, University of Connecticut

D-173 Tomato, Septoria Leaf Spot - Dark leaf spots caused by the fungus *Septoria lycopersici* have tan centers with black spots (pycnidia) in their centers.



Robert L. Wick, University of Massachusetts

D-176 Tomato, Tobacco Mosaic Virus - Symptoms of TMV are highly variable on leaves and fruit. Fruit may be unaffected, small, or may show these "brown wall" symptoms in severe cases.



Robert L. Wick, University of Massachusetts

D-179 Tomato, White Mold - Soft rot of tomato fruit caused by the fungus *Sclerotinia sclerotiorum*. Note white, fluffy mycelia and hard, black sclerotia.



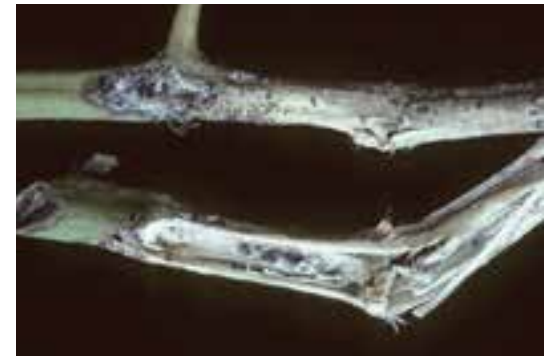
Franklin Schales, University of Maryland

D-174 Tomato, Southern Blight - Tan to brown, mustard seed-like sclerotia are produced by the fungus *Sclerotium rolfsii* at the soil line of infected tomato stems.



Robert L. Wick, University of Massachusetts

D-177 Tomato, Tospovirus - Tomato spotted wilt virus and impatiens necrotic spot virus cause dark brown spots or streaks followed by tip dieback on tomato foliage.



Robert L. Wick, University of Massachusetts

D-180 Tomato, White Mold - Stem rot on tomato caused by the fungus *Sclerotinia sclerotiorum*. Note the hard, dark sclerotia inside the stem.

Strawberry Insects & Diseases



James Dill (ME)

SI-1 Strawberry Bud Weevil - *Anthonomus signatus*



David Handley (ME)

SI-2 Strawberry Bud Weevil - Damage



David Handley (ME)

SI-3 Tarnished Plant Bug - Damage



James Dill (ME)

SI-4 Tarnished Plant Bug - Adult *Lygus lineolaris*



David Handley (ME)

SI-5 Tarnished Plant Bug - Nymph *Lygus lineolaris*



Marvin Pitts (NY)

SI-6 Thrips - Damage



Mary Jean Welser (NY)

SI-7 Thrips (Eastern Flower Thrips) - *Thysanoptera* spp.



David Handley (ME)

SI-8 Twospotted Spider Mites - *Tetranychus urticae*



David Handley (ME)

SI-9 Twospotted Spider Mites - Damage



Marvin Pitts (NY)

SI-10 Cyclamen Mite Injury - *Steneotarsonemus pallidus*



David Handley (ME)

SI-11 Potato Leaf Hopper - Damage



NYSAES

SI-12 Potato Leaf Hopper - Adult *Empoasca fabae*



Marvin Pitts (NY)

SI-13 Spittlebug - *Philaenus spumarius*



David Handley (ME)

SI-14 Cutworm - Damage to blossom



James Dill (ME)

SI-15 Strawberry Rootworm - Adult *Paria canella*



David Handley (ME)

SI-16 Strawberry Root Weevil - Adult *Otiorhynchus ovatus*



David Handley (ME)

SI-17 Black Vine Weevil - Adult *Otiorhynchus sulcatus*



Marvin Pitts (NY)

SI-18 Black Vine Weevil - Larvae & Pupae *Otiorhynchus sulcatus*

Strawberry Insects & Diseases



Marvin Pitts (NY)

SI-19 Root Weevil - Damage



U of Maine

SI-20 White Grub - Various



James Dill (ME)

SI-21 Slug



NYSAES

SI-22 Strawberry Sap Beetle - *Stelidota geminata*



Alan Eaton, University of New Hampshire

SI-23 Strawberry Sap Beetle - *Stelidota geminata*, - larvae



James Dill (ME)

SD-1 Gray Mold - *Botrytis cineria*



Wayne Wilcox (NY)

SD-2 Leather Rot - *Phytophthora cactorum*



Cathy Heidenreich (NY)

SD-3 Anthracnose Fruit Rot - *Colletotrichum*



Marvin Pitts (NY)

SD-4 Anthracnose Crown Rot - *Colletotrichum*

Strawberry Insects & Diseases



Cathy Heidenreich, Cornell University

SD-5 Phomopsis leaf blight, caused by *Phomopsis obscurans*, on strawberry leaf



David Handley (ME)

SD-8 Leaf Scorch - *Diplocarpon earliana*



David Handley (ME)

SD-11 Red Stele Root Rot - Field *Phytophthora fragaria*



Cathy Heidenreich (NY)

SD-6 Angular Leaf Spot - *Xanthomonas fragariae*



David Handley (ME)

SD-9 Powdery Mildew - *Sphaerotheca macularis*



Marvin Pritts (NY)

SD-12 Verticillium Wilt - *Verticillium albo-atrum*



David Handley (ME)

SD-7 Leaf Spot - *Mycosphaerella fragariae*



David Handley (ME)

SD-10 Red Stele Root Rot - Root - *Phytophthora fragaria*



Marvin Pritts (NY)

SD-13 Black Root Rot - Various Fungi



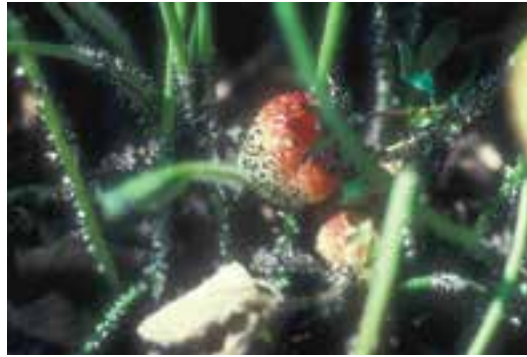
Wayne Wilcox (NY)

SD-14 Black Root Rot - Root Symptoms, Various Fungi



Cathy Heidenreich (NY)

SD-17 Sunscald



David Handley (ME)

SD-15 Slime Mold - Various Fungi



Marvin Pritts (NY)

SD-18 Winter Injury - In Crown



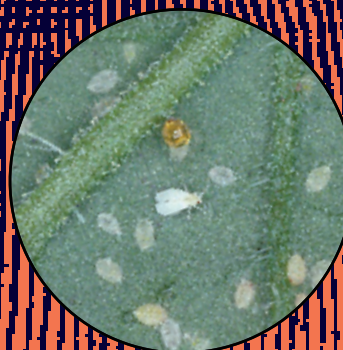
David Handley (ME)

SD-16 Green Petal - MLO



David Handley (ME)

SD-19 Frost - Damage to Blossoms



BACK COVER PHO

Imported Cabbageworm - June Boucher, University of Connecticut
Sweet Potato Pox - James G. Kantzes, University of Maryland
Cucurbits, Black Rot - James G. Kantzes, University of Maryland
Whitefly, Greenhouse - David N. Ferro, University of Massachusetts
Ladybettle, Twelve Spotted - Martin Spellman

OTOS (left to right):

Cabbageworm, Cross-Striped- Clemson University - USDA Cooperative
 Extension Slide Series, www.insectimages.org
Cucurbits, Phytophthora Blight - Kathryn L. Everts, Univ. MD & Univ. of DE
Squash Vine Borer - Alan Eaton, University of New Hampshire
Tarnish Plant Bug Damage - David Handley, University of Maine
Bindweed, Field - Randall G. Prostakl, University of Massachusetts

This guide is a project of the Northeast IPM Vegetable Working Group.