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**A Bibliography of Recent Literature Concerning  
Plant-Disease Prevention**

By CHARLES C. REES and WALLACE MACFARLANE

And

**A Bibliography of Non-Parasitic Diseases  
of Plants**

By CYRUS W. LANTZ

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Plant-Disease Prevention

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CHARLES C. REES and WALLACE MACFARLANE

## PREFACE

In assembling this bibliography, an attempt has been made to include references to every article relating to plant diseases in which control measures are given, the abstract of which has appeared in the Experiment Station Record during the years 1909-14 inclusive.

The classification of the citations, about a thousand in number, has been made under headings of the various hosts arranged in alphabetical order. Under each host the references have been arranged alphabetically according to the common name of the disease when given. No attempt has been made to supply these names, and where they were missing the references are listed under the generic name of the fungus; for instance, an article discussing *Pleospora graminea*, which gave no common name to the disease, is listed under *Pleospora*. In every case where the generic name of the fungus was given, or where it could be supplied with reasonable certainty, it is included in parentheses after the common name of the disease. In many instances authors in discussing a disease caused by a certain fungus gave to the disease different common names; for instance, the disease of Irish potato caused by the fungus *Synchytrium endobiotica* was found referred to by different authors as wart, canker, black canker, and black scab. In such cases it was necessary to select the name most generally accepted and list the various references thereunder. Under each disease the citations have been placed in alphabetical order according to the name of the author.

In order to include as many pertinent references as possible, a general host classification under the headings of citrus fruits, field crops, et cetera, has also been employed. In addition to this there appears a set of references pertaining to fungicides.

Each article includes reference to the original article and to the Experiment Station Record in which the article was found abstracted. The latter reference, in which the first number indicates the volume and the second the page, is placed in parentheses.

# A BIBLIOGRAPHY OF RECENT LITERATURE CONCERNING PLANT-DISEASE PREVENTION

BY CHARLES C. REES, ASSISTANT IN FLORICULTURAL PATHOLOGY RE-  
SEARCH, AND WALLACE MACFARLANE, FELLOW IN AGRONOMY<sup>1</sup>

## ACACIA

Root Disease (*Armillaria-Fomes*)

PETCH, T.

Circs. and Agr. Jour. Roy. Bot. Gard., Ceylon, 5 (1910), 10, 89. (25, 47)  
Uproot and burn the diseased trees.

## ALFALFA

Diseases, General

STEWART, F. C., FRENCH, G. T., and WILSON, J. K.  
N. Y. (Geneva) Sta. Bul. 305. (20, 846)

Blight (*Pseudomonas*)

SACKETT, W. G.

Colo. Sta. Bul. 158. (23, 546) Introduce resistant varieties that will stand  
late spring frosts. Clip off frosted alfalfa as soon as danger of frost is passed,  
which will afford an early growth of a new cutting.

Club Root (*Urophlyctis*)

KORFF, G.

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., 7 (1909), 21, 157. (23, 248)

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, 1907, 16, 267. (20, 845)

Rust (*Uromyces*)

PAMMEL, L. H., and KING, C. M.

Ia. Sta. Bul. 131. (27, 445)

Stem Rot (*Rhizoctonia*)

LAURER, G.

Illus. Landw. Ztg., 30 (1910), 46, 439. (23, 741) Liquid manure, quick-  
lime, and creosol recommended.

<sup>1</sup>Working under the direction of Dr. F. L. Stevens, Professor of Plant Pathology,  
University of Illinois.

## ALMOND

Diseases, General

ARNAUD, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 15, 451. (21, 245)

## APPLE

Diseases, General

BROOKS, C.

N. H. Sta. Bul. 144. (22, 747)

McCORMACK, E. F.

Ann. Rpt. State Ent. Ind., **3** (1909-10), 128. (25, 45)

MORSE, W. J., and LEWIS, C. E.

Me. Sta. Bul. 185. (24, 745)

PRILLIEUX, E.

Bul. Soc. Nat. Agr. France, **68** (1908), 5, 286. (20, 453)

REED, H. S., COOLEY, J. S., and ROGERS, J. T.

Va. Sta. Bul. 195. (27, 152)

STEVENS, F. L.

N. C. Sta. Bul. 206. (23, 453)

STEWART, F. C.

West N. Y. Hort. Soc. Proc., **56** (1911), 61. (26, 55) Keep trees in vigorous condition and spray regularly and thoroly.

SWINGLE, D. B.

Mont. Sta. Circ. 37. (31, 644)

Anthracnose (*Glavosporium*)

CORDLEY, A. B.

Better Fruit, **4** (1909), 4, 13. (22, 349) Spray with Bordeaux soon after fruit is gathered. Spray again after the leaves have fallen with Bordeaux or lime sulfur.

JACKSON, H. S.

Ore. Sta. Bien. Crop Pest and Hort. Rpt. 1911-12, 178. (29, 153) Control measures given in Exp. Sta. Rec., **29**, 249.

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Ore. Sta. Circ. 17. (27, 249) Apply 4-4-50 Bordeaux in fall before rains, and 6-6-50 Bordeaux as soon as fruit is picked. Give an additional spraying earlier in the season if disease is bad. Cut out cankers.

LAWRENCE, W. H.

Bien. Rpt. Bd. Hort. Ore., **12** (1911-12), 93. (31, 53) Repeated spraying recommended. Spray in autumn following maturity of fruit. Bordeaux-petroleum emulsion gives promise.

LOWNSDALE, M. O.

Better Fruit, **5** (1910), 1, 44. (23, 745) To prevent new infection during the succeeding year, spray in September with a solution of 1 gallon of lime sulfur in 18 gallons of water.

Bitter Rot (*Glomerella*)

LAUBERT, R.

Deut. Obstbau Ztg., 1910, 14, 175. (23, 548)

LOUNSBURY, C. P.

Agr. Jour. Cape Good Hope, 37 (1910), 4, 355. (24, 348)

WOLF, F. A.

Proc. Ala. State Hort. Soc., 9 (1912), 69. (27, 546)

Blister Canker (*Nummularia*)

GLOYER, W. O.

Ohio (Wooster) Sta. Circ. 125. (27, 749) Remove and destroy all diseased parts. Cover wounds after pruning with asphaltum or grafting wax.

PAMMEL, L. H., and KING, C. M.

Ia. Sta. Bul. 131. (27, 445)

Blotch (*Phyllosticta*)

LEWIS, D. E.

Kans. Sta. Bul. 196. (31, 53) 3-4-50 Bordeaux recommended. Lime sulfur found to be less effective than Bordeaux except in wet weather, when Bordeaux has a tendency to russet the fruit.

SCOTT, W. M., and RORER, J. B.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 144. (20, 1044) Apply 5-5-50 Bordeaux three weeks after petals have fallen. Follow with three applications at intervals of two weeks.

Canker (*Sphaeropsis*)

BROOKS, C., and DEMERITT, M.

Phytopath., 2 (1912), 5, 181. (28, 548) Plow under diseased leaves. Apply Bordeaux and lime sulfur.

DUCLOUX, A.

Rev. Hort. (Paris), 82 (1910), 21, 506; 22, 520. (24, 450)

EVANS, I. B. P.

Transvaal Agr. Jour., 7 (1908), 25, 62. (20, 848) Destroy all decayed fruit, prune out cankers, and spray with Bordeaux.

HESLER, L. R.

Proc. Ind. Acad. Sci., 1911, 325. (29, 752) Prune off diseased limbs below point of attack. Select for planting nonsusceptible varieties.

MCCREADY, S. B.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, 35 (1909), 41. (23, 351) Good cultivation, thoro spraying, careful cutting out of all cankers, and destruction of diseased rubbish recommended.

SALMON, E. S.

Gard. Chron., 3 ser., 47 (1910), 1217, 258. (23, 549)

WOLF, F. A.

Phytopath., 3 (1913), 6, 288. (30, 650) Spray early in season with Bordeaux.

(ANON.)

Bd. Agr. and Fisheries (London) Leaflet 281 (1913). (30, 650) Remove dead branches and leaves and spray with half-strength Bordeaux a week after petals fall, and again one month later.

Crown Gall (*Pseudomonas*)

HEDGCOCK, G. G.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 186. (24, 249) To keep nursery free from disease, leave all diseased trees in the field at the time of digging and burn them as soon as dry. Scions from healthy trees and stocks from seed of sound trees *only* should be used. Avoid wounding of trees during cultivation.

Fire Blight (*Bacillus*)

HALL, J. G.

Wash. Sta. Popular Bul. 56. (29, 848) Remove and burn all diseased parts.

JACKSON, H. S.

Ore. Sta. Circ. 7. (23, 454)

LAWRENCE, W. H.

Bien. Rpt. Bd. Hort. Ore., 12 (1911-12), 107. (31, 53)

PICKETT, B. S.

Ill. Sta. Circ. 172. (31, 644) Remove infected trees, which carry disease over winter.

SWINGLE, D. B.

Mont. Sta. Circ. 2. (23, 352)

(ANON.)

Queensland Agr. Jour., 26 (1911), 5, 266. (25, 455) Spray trees several times during winter with red oil. Follow after foliage appears with a weak kerosene oil emulsion, applied with a brush to cankers on trunk.

Fruit Spot (*Cylindrosporium*)

BROOKS, C.

N. H. Sta. Sci. Contrib. 2, 423. (20, 847) To prevent disease, apply Bordeaux in June or July.

Fruit Spot (*Phoma*)

BROOKS, C.

N. H. Sta. Bul. 157. (27, 849)

LEWIS, C. E.

Me. Sta. Bul. 170. (22, 547)

Leaf Spot (*Cladosporium*)

CHITTENDEN, F. J.

Jour. Roy. Hort. Soc. (London), 33 (1908), 2, 500. (20, 547) To check germination of fungus spores, apply dilute Bordeaux.

Mildew, Powdery (*Podosphaera*)

BALLARD, W. S., and VOLCK, W. H.

U. S. Dept. Agr. Bul. 120, 26. (31, 748) Spray foliage with iron-sulfid solution or with precipitated sulfur. Prune in winter.

BOLL, J.

Deut. Obstbau Ztg., 1912, 3, 47. (26 750) Lime sulfur, 1-20, recommended.

ERIKSSON, J.

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., 7 (1909), 6, 73; 7, 96. (22, 349)  
Burn all old leaves and affected shoots. Spray with 1-percent copper-sulfate solution. One-percent potassium-sulfid solution also recommended. Mix lime in soil around trees.

LÜSTNER, G.

Ber. K. Lehranst. Wein, Obst u. Gartenbau Geisenheim, 1909, 120. (24, 156) Destroy diseased branches on which perithecia are found. Sulfur and lime-sulfur spray recommended.

VOLCK, W. H.

Better Fruit, 5 (1911), 8, 39; 9, 60. (25, 145) Iron sulfid recommended as a summer spray.

#### Rust (*Gymnosporangium*)

BARTHOLOMEW, E. T.

Phytopath., 2 (1912), 6, 253. (28, 748) Bordeaux recommended.

FULTON, H. R.

N. C. Sta. Rpt. 1912, 62. (29, 49) For prevention, spray: (1) just after leaves emerge from bud, (2) just before blossoms open, (3) just after petals fall, and (4) ten days later.

GIDDINGS, N. J.

W. Va. Crop Pest Com. Bul. 2, 7. (30, 651) Destroy all cedars within a mile of apple orchard.

————— and NEAL, D. C.

Phytopath., 2 (1912), 6, 258. (28, 748) Bordeaux recommended.

HEALD, F. D.

Nebr. Sta. Rpt. 1908, 103. (22, 47)

HEIN, W. H.

Insect Pest and Plant Disease Bur. Nebr., Div. Bot. Circ. 1. (21, 644)  
Remove cedar trees and plant resistant varieties of apple.

REED, H. S., COOLEY, J. S., and CRABILL, C. H.

Va. Sta. Bul. 203. (30, 450) Copper lime sulfur and lime sulfur both found to be effective.

WOLF, F. A.

Proc. Ala. State Hort. Soc., 9 (1912), 69. (27, 546)

#### Scab (*Venturia*)

BEATTIE, R. K.

West. Fruit-Grower, 20 (1909), 1, 6. (21, 244) Lime sulfur superior to Bordeaux. Solution of 1 pound of sulfur, ½ pound of lime, and 5 gallons of water recommended.

Phytopath., 4 (1914), 1, 42. (31, 346) Spray thoroly with lime sulfur under heavy pressure, twice during the season.

BLODGETT, F. M.

Phytopath., 4 (1914), 1, 44. (31, 449) Dust with sulfur and treat host with sulfur suspension in water.



BRETSCHNEIDER, A.

Wiener Landw. Ztg., **59** (1909), 100, 980. (22, 650)

DARROW, W. H.

Phytopath., **3** (1913), 5, 265. (30, 542) The disease may be carried over on young shoots, and the application of some strong fungicide to these before the opening of the leaf buds will reduce infection from this source.

FISCHER, F.

Ztschr. Pflanzenkrank., **19** (1909), 7, 432; abs. in Riv. Patol. Veg., **4** (1910), 7, 97. (23, 151) No immune varieties. Apply Bordeaux in spring before leaves appear.

MCCREADY, S. B.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, **36** (1910), 42. (25, 549) Apply home-boiled lime sulfur just before leaves open; give second application of commercial lime sulfur at the opening of blossom buds; and spray for the third time with 1-30 commercial lime sulfur when blossoms fall.

MALLY, C. W.

Agr. Jour. Cape Good Hope, **35** (1909), 2, 202. (22, 50) One application of 6-4-50 Bordeaux gave 60 percent sound fruit; two applications gave 90 percent sound fruit; and three applications rendered fruit practically free from disease.

MORRIS, H. E.

Mont. Sta. Bul. 96. (31, 645) Plant resistant varieties and spray thoroly.

NICHOLLS, H. M.

Agr. Gaz. Tasmania, **21** (1913), 10, 387. (30, 541) Plow fallen leaves under early, harrow surface, and leave undisturbed until after November 15. Spray trees early in October with Bordeaux, Burgundy, or lime-sulfur mixture, adding one pound of wheat flour to each gallon of solution in order to promote spreading and adhesion.

SALMON, E. S.

Jour. Bd. Agr. (London), **15** (1908), 3, 182. (20, 950) Wash trees in winter with strong solution of copper sulfate. Apply 4-4-50 Bordeaux in spring.

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Jour. Southeast Agr. Col. Wye, 1907, 16, 267. (20, 845)

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Jour. Southeast Agr. Col. Wye, 1909, 18, 267. (25, 247) Judicious spraying with 4-100 copper-sulfate solution in February followed by two or three sprayings with Bordeaux controls the disease.

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Jour. Southeast Agr. Col. Wye, 1911, 20, 408. (28, 448) Bordeaux recommended over lime sulfur.

SCHANDER, R.

Deut. Landw. Presse, **36** (1909), 7, 63. (21, 54) Bordeaux (2 percent) more efficient than carbolineum ( $\frac{1}{2}$  percent).

VOGES, E.

Ztschr. Pflanzenkrank., **20** (1910), 7, 385; rev. in Gard. Chron., 3 ser., **48** (1910), 1250, 432. (24, 450) Apply Bordeaux in spring.

WALLACE, E.

N. Y. (Cornell) Sta. Bul. 335. (30, 848) Lime sulfur recommended.

Rpt. Niagara Sprayer Co. Fellowship, 2 (1909), 10. (22, 650) Lime sulfur, 1-30, as efficient as 3-4-50 Bordeaux and does not cause injury to leaves or fruit.

(ANON.)

Ore. Agr. Col. Bul. 48, 1 ser. (25, 247) Spray with 1-15 lime sulfur when blossoms show pink.

### ARROWROOT

Diseases, General

(ANON.)

Agr. News (Barbados), 10 (1911), 237, 174. (25, 654) Destroy diseased plants. Aerate soil thoroly. Rotate with cotton.

### ASPARAGUS

Foot Rot (*Zopfia*)

FARNETI, R.

Riv. Patol. Veg., 4 (1910), 18, 273. (25, 44) Burn diseased plants. Disinfect beds with carbon disulfid.

### ASTER

*Milowia*

MASSE, G.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 1912, 1, 44. (26, 551) Sterilize seed bed with formalin or steam. Apply coal ashes.

### AZALEA

Diseases, General

HARTMANN, J.

Gartenwelt, 14 (1910), 19, 217. (24, 252) Destroy diseased limbs. Sprav with copper sulfate, 1½ percent.

Gall (*Exobasidium*)

LAUBERT, L.

Handelsbl. Deut. Gartenbau, 24 (1909), 466; abs. in Bot. Ztg., 2 Abt., 67 (1909), 20-21, 285. (22, 351) Use Bordeaux or sulfur. Remove and destroy diseased parts.

### BANANA

Banana Disease (Unnamed)

LEVY, H. Q.

Jour. Jamaica Agr. Soc., 14 (1910), 7, 241. (23, 747)

Blight

McKENNEY, R. E. B.

Abs. in Science, n. ser., 31 (1910), 802, 750. (23, 455)

Smut (*Ustilagenoidella*)

ESSED, E.

Ann. Bot. (London), **25** (1911), 98, 363. (25, 350) Copper sulfate recommended.

## BARLEY

Late Blight (*Helminthosporium*)

BAKKE, A. L.

Proc. Ia. Acad. Sci., **19** (1912), 93. (29, 750) Keep soil in sanitary condition. Treat seed with formalin.

EDINBURGH and EAST OF SCOTLAND COLLEGE OF AGRICULTURE

Rpt. **30** (1913), 15. (31, 147) Formalin and copper sulfate treatment of seeds greatly reduces late blight.

JOHNSON, A. G.

Phytopath., **4** (1914), 1, 46. (31, 446) Soak seed five hours in cold water, and then for fifteen minutes in water at 52° C.

*Pleospora*

MORTENSEN, M. L.

Tidsskr. Landbr. Planteavl, **16** (1909), 1, 110. (22, 246) Dip seed 20 times in five minutes in water at 57° C.

Smut (*Ustilago*)

APPEL, O.

Illus. Landw. Ztg., **29** (1909), 55, 521. (22, 48) Hot-water treatment recommended.

————— and RIEHM, E.

Arb. K. Biol. Anst. Land u. Forstw., **8** (1911), 3, 343. (26, 546) Soak seed in water at 50° C. for seven to ten minutes, then expose to air at 50° C. for five minutes only.

BROILI, J.

Naturw. Ztschr. Forst u. Landw., **8** (1910), 7, 335. (23, 741)

Naturw. Ztschr. Forst u. Landw., **9** (1911), 1, 53. (24, 647)

HEALD, F. D.

Nebr. Sta. Rpt. 1907, 45. (20, 450) Formalin, 1-25, hot water, and copper sulfate recommended.

GISEVIUS, P., and BÖHMER

Illus. Landw. Ztg., **30** (1910), 77, 725. (24, 346) Drying apparatus to be used in hot-air method described.

KÜHLE, L.

Illus. Landw. Ztg., **28** (1908), 67, 578. (20, 947) Soak seed in water at 65° C. for twelve minutes.

SPERLING, J.

Illus. Landw. Ztg., **30** (1910), 9, 66. (23, 46) Soak seed in water at 25° C. for four hours, and then expose to air at 50° C. for thirty minutes.

TEPIN, H.

Sveriges Utsädesför. Tidskr., **19** (1909), 2, 119. (22, 246) Hot-water treatment recommended.

**BEAN**

## Diseases, General

WHETZEL, H. H.

N. Y. (Cornell) Sta. Bul. 255. (20, 546) Select clean seed.

Anthracnose (*Colletotrichum*)

EDGERTON, C. W.

La. Sta. Bul. 116. (21, 549) Select clean seed.

MUNCIE, J. H.

Mich. Sta. Special Bul. 68. (31, 542)

QUERNER, H.

Ztschr. Landw. Kammer Braunschweig, **77** (1908), 31, 367. (20, 648)  
Good drainage, clean seed, and application of ammoniacal copper carbonate as  
a preventative, recommended.

VON DIAKONOFF, H.

Geisenh. Mitt. Obst u. Gartenbau, **24** (1909), 4, 57. (22, 546)

WILCOX, E. M., and TEMPLE, C. E.

Insect Pest and Plant Disease Bur. Nebr., Div. Bot. Circ. 6. (21, 642)  
Remove and burn diseased plants.Blight (*Alternaria*)

FERRARIS, T.

Riv. Patol. Veg., **3** (1909), 16, 241. (20, 1138) Bordeaux or soda Bordeaux  
recommended.Blight (*Pseudomonas*)

EDGERTON, C. W., and MORELAND, C. C.

La. Sta. Bul. 139. (28, 846) Select clean seed and treat with corrosive  
sublimate before planting.

MUNCIE, J. H.

Mich. Sta. Special Bul. 68. (31, 542)

Mildew, Downy (*Plasmopara*)

JARVIS, C. D.

Conn. Storrs Sta. Rpt. 1908-09, 31. (22, 743) 2-2-50 Bordeaux recom-  
mended.Rust (*Uromyces*)

FUSCHINI, C.

Revista (Conegliano), 4 ser., **17** (1911), 19, 443; abs. in Internat. Inst. Agr.  
(Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **2** (1911), 11-12, 2600. (27, 47)  
Apply iron sulfate to soil.

GASSNER, G.

Rev. Secc. Agron. Univ. Montevideo, 1908, 4, 125. (22, 746)

**BEEF**

## Diseases, General

BUSSE, W., and ULRICH, P.

Mitt. K. Biol. Anst. Land u. Forstw., 1909, 8, 21. (23, 348)

SCHANDER, R.

Deut. Zucherindus., **35** (1910), 5, 110; abs. in Centbl. Bakt. (etc.), 2 Abt., **27** (1910), 10, 307. (23, 745)

STIFT, A.

Centbl. Bakt. (etc.), 2 Abt., **23** (1909), 6, 173. (22, 347)

STÖRMER, K.

Bl. Zuckerrübenbau, **15** (1908), 16, 247; 17, 264; 18, 279. (21, 52)

WOHANKA & Co.

Ann. Amer. Rpt. Sugar Beet Seed Breeding Sta., **3** (1910), 30. (26, 648)

Club Root (*Urophlyctis*)

GRIFFON and MAUBLANC

Bul. Trimest. Soc. Mycol. France, **25** (1909), 2, 98. (21, 642)

Damping-off

STIFT, A.

Österr. Ungar. Ztschr. Zuckerindus. u. Landw., **40** (1911), 2, 211. (25, 349)

STÖRMER, K., and EICHINGER, A.

Fühling's Landw. Ztg., **59** (1910), 12, 393; abs. in Bl. Zuckerrübenbau, 17 (1910), 14, 229; 15, 245. (24, 248) Lime, phosphoric acid, and either table salt or potash recommended.

Heart Rot (*Phoma*)

BUSSE, W., and ULRICH, P.

Mitt. K. Biol. Anst. Land u. Forstw., 1909, 8, 21. (23, 348) When tested, ammonium salts showed no advantage over saltpeter.

GRIFFON and MAUBLANC

Bul. Trimest. Soc. Mycol. France, **25** (1909), 2, 98. (21, 642)

HEGYI, D.

Ztschr.-Pflanzenkrank., **21** (1911), 5, 269. (26, 548) Dry the seed, fertilize plants, and cultivate properly.

KÄPPELI, J., and MORGENTHALER, O.

Landw. Jahrb. Schweiz, **27** (1913), 8, 432. (31, 344) Employ least susceptible varieties. Plant other and non-susceptible crops between beets and dusty roadside.

KRÜGER, W.

Bl. Zuckerrübenbau, **16** (1909), 24, 369. (23, 248) Apply to soil humus and a nitrogenous fertilizer that will give an acid reaction.

LABBÉ, G.

Bul. Assoc. Chim. Sucr. et Distill., **28** (1910), 1, 119. (24, 155) The addition of nitrogenous fertilizers increases the disease. Heart rot is more intense during dry periods and less active with plants low in sugar content. Phosphoric acid, humus, and lime in various proportions recommended.

LINHART, G.

Monatsh. Landw., **1** (1908), 356; abs. in Bot. Centbl., **110** (1909), 18, 473. (23, 248)

PETERS, L.

Mitt. K. Biol. Anst. Land u. Forstw., 1909, 8, 25. (23, 248)

RUHLAND, W., and ALBRECHT, K.

Mitt. K. Biol. Anst. Land u. Forstw., 1910, 10, 16. (23, 648)

SCHANDER, R.

Deut. Zuckerindus, **34** (1909), 6, 121; abs. in Centbl. Bakt. (etc.), 2 Abt., **26** (1910), 8, 309. (23, 348) Fertilize with liquid manure and calcium nitrate.

STIFT, A.

Österr. Ungar. Ztschr. Zuckerindus. u. Landw., **40** (1911), 2, 252. (25, 349)

#### Leaf Spot (*Cercospora*)

GRIFFON and MAUBLANC

Bul. Trimest. Soc. Mycol. France, **25** (1909), 2, 98. (21, 642)

POOL, V. W., and MCKAY, M. B.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 121, 13. (29, 48) Remove tops from the field while still green and make into silage. This process kills the fungus.

#### Mildew, Downy (*Peronospora*)

GRIFFON and MAUBLANC

Bul. Trimest. Soc. Mycol. France, **25** (1909), 2, 98. (21, 642)

STÖRMER, K.

Bl. Zuckerrübenbau, **17** (1910), 5, 88. (23, 348)

#### Root Rot (*Pythium*)

BUSSE, W.

Bl. Zuckerrübenbau, **15** (1908), 19, 297. (20, 546)

HEGYI, D.

Bul. Trimest. Soc. Mycol. France, **27** (1911), 2, 153; abs. in Bot. Centbl., **119** (1912), 1, 19. (26, 747) Maintain water content of 10 percent or less.

RIEHM, E.

Bl. Zuckerrübenbau, **16** (1909), 10, 145. (22, 347) The soaking of seed for various lengths of time in phenol, formalin, Bordeaux, copper-soda mixture, or copper sulfate is better than hot-water treatment.

STÖRMER, K.

Bl. Zuckerrübenbau, **17** (1910), 5, 88. (23, 348) Lime recommended.

#### Root Rot (*Rhizoctonia*)

BRIEM, H.

Ztschr. Zuckerindus, Böhmen, **36** (1911), 1, 23. (27, 47) Keep plenty of available lime in the soil and aerate by stirring the soil with a hoe.

ERIKSSON, J.

Rev. Gén. Bot., **25** (1913), 298, 14. (29, 50) Remove from the field all infected plants, disinfect seed, examine and destroy all stored roots that are diseased. Practice long rotation, four years or more.

#### Rust (*Puccinia*)

POOL, V. W., and MCKAY, M. B.

Phytopath., **4** (1914), 3, 204. (31, 842) Destroy salt grass, which is quite common along roadsides and ditches.

Rust (*Uromyces*)

GRIFFON and MAUBLANC

Bul. Trimest. Soc. Mycol. France, **25** (1909), 2, 98. (21, 642)Yellows (*Bacillus*)

MALAQUIN, A., and MOITIÉ, A.

Engrais, **29** (1914), 9, 241. (31, 243) Dry seed at from 40° to 55° C. to a water content of about 7 percent. A rigorous selection of the roots to be used for the production of seed is advised.

**BLACKBERRY**Anthracnose (*Glauosporium*)

LAWRENCE, W. H.

Wash. Sta. Bul. **97**. (23, 452) To check disease, cut and burn all infected canes. As a preventative, spray with 4-4-50 Bordeaux before leaves appear. Give second application when leaves are expanded.

Crown Gall (*Pseudomonas*)

SWINGLE, D. B.

Mont. Sta. Circ. **37**. (31, 644)Rust (*Gymnoconia*)

WILSON, G. W.

N. C. Sta. Rpt. 1912, 56. (29, 50)

**BREADFRUIT**

## Disease, Unnamed

STOCKDALE, F. A.

Jour. Bd. Agr. Brit. Guiana, **6** (1912), 1, 14. (28, 153) Collect and burn all diseased fruits. Spray trees with 4-percent copper-sulfate solution or Bordeaux.

**BRUSSELS SPROUTS**Club Root (*Plasmodiophora*)

WORCESTER COUNTY EXPERIMENTAL GARDEN, DROITWICH

Ann. Rpt. 1912; abs. in Jour. Bd. Agr. (London), **20** (1914), 11, 1010. (31, 149) Gas lime or quicklime dug in or left on surface, recommended.

**CABBAGE**

## Diseases, General

Bos, J. Ritzema, and QUANJER, H. M.

Tijdschr. Plantenziekten, **16** (1911), 4-6, 101. (26, 546)

HARTER, L. L.

U. S. Dept. Agr., Farmers' Bul. 448. (27, 249)

Blackleg (*Phoma*)

MANN, T. F.

Ohio (Wooster) Sta. Bul. **228**. (25, 653) To control disease, treat seed with formalin, use new seed beds each year, and destroy all diseased plants. Rotate crops.

Club Root (*Plasmodiophora*)

LAWRENCE, W. H.

Wash. Sta. Bul. 5, spec. ser. (23, 647)

REED, H. S.

Va. Sta. Bul. 191. (25, 845) Apply lime at the rate of 100 bushels per acre for one or two years before planting cabbage. Rotate crops.

Wilt (*Fusarium*)

HARTER, L. L.

Science, n. ser., 30 (1909), 782, 934. (22, 453)

MANN, T. F.

Ohio (Wooster) Sta. Bul. 228. (25, 653) To control disease, treat seed with formalin, use new seed beds each year, and destroy all diseased plants. Rotate crops.

## CACAO

## Diseases, General

HART, J. H.

West India Com. Circ. 24, 289, 509; 290, 533. (22, 151)

STOCKDALE, F. A.

Imp. Dept. Agr. West Indies Pamphlet 54. (20, 1046)

VON FABER, F. C.

Arb. K. Biol. Anst. Land u. Forstw., 7 (1909), 2, 193. (21, 749)

Canker (*Phytophthora*)

RORER, J. B.

Bul. Dept. Agr. Trinidad, 9 (1910), 65, 79. (23, 748)

Bd. Agr. Trinidad and Tobago Circ. 10, 1913, 13. (29, 851) Bordeaux better than severe cutting back. See Exp. Sta. Rec., 20, 1141.

VAN HALL, C. J. J., and DROST, A. W.

Rec. Trav. Bot. Néerland., 4 (1908), 4, 243; Jour. Bd. Agr. Brit. Guiana, 2 (1909), 3, 126; Roy. Bot. Gard. Kew, Bul. Misc. Inform., (1909), 5, 223. (20, 1141)

(ANON.)

Agr. News (Barbados), 9 (1910), 214, 222. (23, 748) Bordeaux recommended.

Dieback (*Diplodia*)

BANCROFT, C. K.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 1910, 3, 93. (23, 354) Cut out and destroy the diseased branches and parts. Cover wounds with coal tar and clay. Manure and cultivate carefully.

## CARNATION

Leaf Disease (*Heterosporium*)

BLIN, H.

Rev. Hort. (Paris), 82 (1910), 5, 104. (23, 153)



Rust (*Uromyces*)

FONDARD, L.

Rev. Hort. (Paris), **82** (1910), 14, 336. (23, 751) Dust thoroly with sulfur and spray with copper sulfate.

Stem Rot (*Fusarium*)

WRIGHT, C. J.

Pomona Col. Jour. Econ. Bot., **2** (1912), 3, 315. (28, 851) Use cuttings from healthy plants; change soil from year to year; protect against extreme heat and moisture; do not injure plants in transplanting.

Stem Rot (*Rhizoctonia*)

BLAKE, M. A., and FARLEY, A. J.

N. J. Sta. Rpt. 1910, 78. (27, 752)

**CARROT**Stem Rot (*Rhizoctonia*)

ERIKSSON, J.

Rev. Gén. Bot., **25** (1913), 298, 14. (29, 50) Remove and destroy all infection. Disinfect seed. Practice four-year rotation.

**CASSAVA**

## Root Rot

DE KRUIJFF, E.

Teysmannia, **21** (1910), 3, 147. (23, 547) Use lime on soil.

**CELERY**Blight, Early (*Cercospora*)

STREIGHT, E. M.

Veg. Grower, **2** (1912), 3, 4. (27, 849) Bordeaux.

WINTERS, R. Y.

Fla. Sta. Rpt. 1908, 97. (21, 342)

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Fla. Sta. Rpt. 1909, 79. (23, 451) Dry Bordeaux and air-slaked lime both effective.

Blight, Late (*Septoria*)

KLEBAHN, H.

Jahrb. Hamburg. Wiss. Anst., **30** (1912), 3, 1. (30, 847)

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Ztschr. Pflanzenkrank, **20** (1910), 1, 1. (22, 746) Bordeaux recommended.

OSBORN, T. G. B.

Jour. Dept. Agr. So. Aust., **16** (1912), 4, 402. (28, 847) Apply dilute Bordeaux or potassium-sulfid solution (1 ounce to 3 gallons of water). Keep storehouse dry and well ventilated. Destroy affected refuse and purchase only fungus-free seeds.

ROGERS, S. S.

Cal. Sta. Bul. 208. (24, 551) Apply 5-6-50 Bordeaux at the rate of 35 gallons per acre when the plants are young. Apply same strength at the rate of 100 gallons per acre when the plants are over 15 inches high. Spray seedlings.

SALMON, E. S.

Gard. Chron., 3 ser., **53** (1913), 1382, 414; 1384, 3. (29, 846) Dip plants in Bordeaux while planting and spray with Bordeaux once in June, in July, and in August.

STREIGHT, E. M.

Veg. Grower, **2** (1912), 3, 4. (27, 849) Bordeaux.

(ANON.)

Jour. Bd. Agr. (London), **16** (1910), 12, 1010. (23, 148) Apply Bordeaux, one-half strength, as soon as disease appears and give one application each week thereafter for three weeks.

(ANON.)

Gard. Chron., 3 ser., **55** (1914), 1418, 150. (31, 344) Copper sprays ineffective. Manuring has no effect. Dry weather and artificial watering are probably beneficial.

#### Foot Rot (*Sclerotinia*)

WINTERS, R. Y.

Fla. Sta. Rpt. 1908, 97. (21, 342)

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Fla. Sta. Rpt. 1909, 79. (23, 451) Dry Bordeaux and air-slaked lime both effective.

#### Scab (*Phoma*)

KLEBAHN, H.

Ztschr. Pflanzenkrank., **20** (1910), 1, 1. (22, 746) Disinfect soil.

### CHERRY

#### Brown Rot (*Sclerotinia*)

BARNA, B.

Abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **3** (1912), 7, 1681. (28, 244) Keep orchards clean and spray.

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, 1907, 16, 267. (20, 845)

#### Canker (*Cytospora*)

WORMALD, H.

Jour. Southeast Agr. Col. Wye, 1912, 21, 367. (30, 352) Remove and burn diseased parts.

#### Gummosis (*Pseudomonas*)

BARSS, H. P.

Ore. Sta. Bien. Crop Pest and Hort. Rpt. 1911-12, 198. (29, 154) Use resistant stock. Cut out cankers and remove small infected twigs.

Leaf Scorch (*Gnomonia*)

MARRÉ, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **31** (1910), 4, 121. (23, 151) Burn leaves in fall and spray in spring with Bordeaux.

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, 1907, 16, 267. (20, 845)

Leaf Spot (*Cylindrosporium*)

STEWART, V. B.

N. Y. (Cornell) Sta. Circ. 21 (1914). (30, 848) Bordeaux 5-5-50 and lime-sulfur solution, 1 gallon to 50 gallons of water, recommended. The addition of granulated iron sulfate prevents burning.

Mildew, Powdery (*Podosphæra*)

HEIN, W. H.

Insect Pest and Plant Disease Bur. Nebr., Div. Bot. Circ. 2. (21, 643)

Shot-Hole Disease (*Cercospora*)

RUSSELL, H. L.

Wis. Sta. Bul. 218. (27, 45). Lime sulfur inefficient.

## CHESTNUT

## Diseases, General

METCALF, H.

Trans. Mass. Hort. Soc., 1912, pt. 1, 69. (27, 753)

Blight (*Endothia*)

ANDERSON, P. J., and RANKIN, W. H.

N. Y. (Cornell) Sta. Bul. 347 (1914). (31, 751)

BRIOSI, G., and FARNETI, R.

Abs. in Bot. Centbl., **110** (1909), 19, 489. (22, 749)

BROOKS, A. B.

W. Va. Crop Pest Com. Bul. 2 (1913), 12. (30, 653)

CARLETON, M. A.

Amer. Fruit and Nut Jour., **6** (1912), 97, 78. (28, 153)

METCALF, H., and COLLINS, J. F.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 141. (21, 748) Cut out and burn all infected trees.

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U. S. Dept. Agr., Farmers' Bul. 467. (26, 146) Destroy all infected trees.

MICKLEBOROUGH, J.

Harrisburg: Penn. Dept. Forestry, 1909. (22, 652)

PRUNET, A.

Bul. Soc. Nat. Agr. France, **69** (1909), 10, 926; Rev. Vit., **33** (1910), 838, 21. (23, 49)

STERLING, E. A.

Engin. News, **60** (1908), 13, 332. (20, 757)

(ANON.)

Forest Leaves, **13** (1911), 6, 88. (27, 252)**CHRYSANTHEMUM**Crown Gall (*Pseudomonas*)

LAUBERT, R.

Möller's Deut. Gärt. Ztg., **28** (1913), 41, 486. (30, 354) Destroy or prune deeply.Rot (*Botrytis*)

CREPIN, H.

Jour. Soc. Nat. Hort. France, 4 ser., **11** (1910), 52. (22, 750)**CINERARIA**Rust (*Coleosporium*)

CHITTENDEN, F. J.

Jour. Roy. Hort. Soc. (London), **33** (1908), 2, 511. (20, 550) Spray with potassium permanganate.**CLOVER**Anthracnose (*Glavosporium*)

BAIN, S. M., and ESSARY, S. H.

Science, n. ser., **31** (1910), 802, 756. (23, 448)

FULTON, H. R.

Science, n. ser., **31** (1910), 802, 752. (23, 448) Rotation of crops and early mowing of infected fields recommended.Stem Rot (*Rhizoctonia*)

ERIKSSON, J.

Rev. Gén. Bot., **25** (1913), 298, 14. (29, 50) Remove from field all infected plants; disinfect seed; examine and destroy all stored roots that are diseased; practice long rotation, four years or more.**COCONUT**Bleeding Stem (*Thielaviopsis*)

PETCH, T.

Brit. Mycol. Soc. Trans., **3** (1908), pt. 2, 108. (22, 248) Cut out diseased tissue, scorch interior with torches, and paint with hot coal tar.Bud Rot (*Bacillus*)

ASHBY, S. J.

Jour. Jamaica Agr. Soc., **17** (1913), 11, 20. (30, 652)

HORNE, W. T.

Estac. Cent. Agr. Cuba Bul. 15, English Ed. (21, 245) Burn out all suspected cases and spray with Bordeaux for protection of healthy trees.

OLLSON-SEFFER, R.

Rev. Trop. Agr., **2** (1912), 4, 295. (27, 353) Destroy diseased buds early and apply fungicide promptly to points of new infection.

RORER, J. B.

Dept. Agr. Trinidad and Tobago, Bul. 11 (1912), 70, 68. (27, 751) Observe proper sanitary measures.

WATES, L. A.

Jour. Jamaica Agr. Soc., 13 (1909), 12, 434. (23, 49)

Dieback (*Diplodia*)

ASHBY, S. J.

Jour. Jamaica Agr. Soc., 17 (1913), 11, 20. (30, 652)

FREDHOLM, A.

Proc. Agr. Soc. Trinidad and Tobago, 9 (1909), 3, 159. (21, 150) Observe proper sanitary precautions.

Leaf Disease (*Pestalozzia*)

STOCKDALE, F. A.

West Indian Bul. 9 (1909), 4, 361. (21, 150)

Root Disease (*Botryodiplodia*)

STOCKDALE, F. A.

West Indian Bul. 9 (1909), 4, 361. (21, 150)

Root Disease (*Fomes*)

PETCH, T.

Circs. and Agr. Jour. Roy. Bot. Gard., Ceylon, 4 (1910), 24, 323. (23, 549) Dead or badly diseased trees should be dug up and the butt end and two or three feet of the trunk above the ground should be burned.

WATES, L. A.

Jour. Jamaica Agr. Soc., 13 (1909), 12, 434. (23, 49) Cut out diseased parts of roots and cauterize parts with hot tar or by burning.

## COFFEE

Leaf Spot (*Sphaerostilbe*)

MASSEE, G.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 1909, 8, 337. (22, 51) Treat soil with carbon bisulfid.

(ANON)

Agr. News (Barbados), 8, (1909,) 193, 292. (21, 749) Remove affected plants, spray, and give careful attention to tillage.

*Phythora Vastatrix*

D'HERELLE, F. H.

Ann. Soc. Rural Argentina, 44 (1910), 68, 40. (23, 749) Lime soil heavily, use non-acid fertilizers, and prune trees to obtain a better circulation of air and to get more sunlight on the ground.

Root Rot (*Rosellinia*)

PATOUILLARD, N.

Jour. Agr. Trop., 10 (1910), 104, 58. (23, 251) Infected trees should be dug up and their roots completely burned in the hole from which they were removed.

Rust (*Hemileia*)

DYBOWSKI, J.

Agr. Prat. Pays Chauds, **9** (1909), 71, 159. (21, 150)

VON FABER, F. C.

Tropenpflanzer, **13** (1909), 5, 235. (22, 51)

## Silver Thread Blight

KUIJPER, J.

Dept. Landb. Suriname Bul. 28, 1912, 11. (29, 351) Bordeaux recommended.

## COLOCASIA

Blight (*Phytophthora*)

BUTLER, E. J., and KULKARNI, G. S.

Mem. Dept. Agr. India, Bot. Ser., **5** (1913), 5, 233. (31, 52) Spray; remove and destroy all spotted leaves.

## CORN

Ear Rot (*Diplodia*)

BURRILL, T. J., and BARRETT, J. T.

Ill. Sta. Bul. 133. (21, 146) Destroy all old stalks from infected field and cease planting corn in this field for at least two years.

Smut (*Ustilago*)

COLLENS, A. E.

Dept. Agr. Trinidad, Bul. Agr. Inform., 1909, n. ser., 61, 33. (22, 47)

JOHNSTON, T. H.

Agr. Gaz. N. S. Wales, **21** (1910), 1, 43. (22, 745)

## COTTON

Anthracnose (*Colletotrichum*)

BARRE, H. W.

S. C. Sta. Circ. 1. (27, 446)

S. C. Sta. Rpt. 1909, 89. (22, 648)

S. C. Bul. 164. (27, 446) Use clean seed and rotate.

S. C. Sta. Rpt. 1911, 23. (26, 647)

S. C. Sta. Rpt. 1913, 14. (30, 538)

\_\_\_\_\_ and AULL, W. B.

Science, n. ser., **40** (1914), 1020, 109. (31, 643) Soak seed in water at 70° C. for 15 minutes before planting.

FULTON, H. R., WINSTON, J. R., and CROMWELL, R. O.

Abs. in Phytopath., **4** (1914), 1, 42. (31, 344)

GILBERT, W. W.

U. S. Dept. Agr., Farmers' Bul. 555. (29, 751) Use resistant varieties. Clean seed. Plow in fall. Rotate.

Blight (*Bacterium*)

MCCALL, J. S. J.

Nyasaland Agr. and Forestry Dept. Bul. 2 (1910). (23, 347) Soak seed in bichlorid of mercury or formalin for an hour before planting.

Texas Root Rot (*Ozonium*)

HEALD, F. D.

Texas Dept. Agr. Bul. 22 (1911). (30, 538) Rotate with wheat, corn, and sorghum. Plow in fall.

Wilt (*Fusarium*)

LEWIS, A. C.

Ga. Bd. Ent. Bul. 34. (25, 44)

Ga. Bd. Ent. Bul. 28. (21, 51)

## COWPEA

Wilt (*Fusarium*)

ARNAUD, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 31 (1910), 43, 517. (24, 347) Disinfect soil with carbon bisulfid and formalin. Plant resistant varieties and rotate.

## CRANBERRY

Blight

SHEAR, C. L.

Proc. Wis. Cranberry Growers' Assoc., 22 (1909), 4. (21, 52) Bordeaux recommended.

## CUCUMBER

Canker (*Mycosphaerella*)

MASSE, G.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 1909, 7, 292, pt. 1; Jour. Bd. Agr. (London), 16 (1909), 7, 579. (22, 50) Bordeaux recommended.

MIDDLETON, T. H.

Bd. Agr. and Fisheries (London), Ann. Rpt. Intel. Div. 1910-11, pt. 2, 54. (27, 353)

(ANON)

Gard. Chron., 3 ser., 54 (1913), 1393, 167. (30, 148)

Leaf Spot (*Corynespora*)

ALTHEIMER

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., 11 (1913), 9, 109. (30, 450) Treat seed with 2-percent copper-sulfate solution before using or shipping.

GROSSER, W.

Illus. Schles. Monatschr. Obst. Gemüse u. Gartenbau, **2** (1913), 8, 137. (30, 149) Before planting, soak seed four hours in .5-percent formalin solution. Spray with 4-percent Bordeaux.

LAUBERT, R.

Deut. Landw. Presse, **38** (1911), 71, 819. (26, 447) Destroy all infectior and spray with Bordeaux.

QUANJER, H. M.

Tijdschr. Plantenziekten, **14** (1908), 78; abs. in Meded Rijks Hoogere Land, Tuin en Boschbouwsch., **1** (1908), 159. (22, 346) Bordeaux recommended.

Mildew, Downy (*Plasmopara*)

JARVIS, C. D.

Conn. Storrs Sta. Rpt. 1908-09, 31. (22, 743) 2-2-50 Bordeaux recommended.

KÖCK, G.

Ztschr. Landw. Versuchw. Österr., **12** (1909), 2, 67. (23, 47)

Rot

BURGER, O. F.

Fla. Sta. Bul. 121 (1914). (30, 648)

## CURRENT

Leaf Spot (*Glæosporium*)

LÜSTNER, G.

Amtsbl. Landw. Kammer, Wiesbaden, **91** (1909), 15, 102; 16, 107. (22, 746) Bordeaux recommended.

ROSENTHAL, H.

Deut. Obstbau Ztg., 1910, 14, 172. (23, 650) Apply ½-percent soda Bordeaux eight days after blossoming and again after berries are gathered.

Mildew (*Sphærotheca*)

LÜSTNER, G.

Amtsbl. Landw. Kammer, Wiesbaden, **91** (1909), 15, 102; 16, 107. (22, 746) Apply solution of 1 kilogram of potassium sulfid to 100 liters of water. Spray every ten days; five to eight applications per season.

Rust (*Cronartium*)

EWERT, R.

Ztschr. Pflanzenkrank., **23** (1913), 8, 463. (31, 346) Apply 1-percent Bordeaux.

## DAHLIA

Root Rot (*Botrytis*)

COOK, M. T., and SCHWARZE, C. A.

Phytopath., **3** (1913), 3, 171. (30, 151) Keep storage room dry, cool, and well ventilated.



**DEWBERRY**

Rust

WILSON, G. W.

N. C. Sta. Rpt. 1912, 56. (29, 50)

**ELM**Twig Disease (*Exosporium*)

ERIKSSON, J.

Mycol. Centbl., 1 (1912), 2, 35. (27, 451) Inspect nursery stock and burn all diseased twigs.

**EUONYMUS**

Mildew, Powdery

FOEX, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 30 (1909), 46, 614. (22, 351) Bordeaux or potassium permanganate recommended.

JANEY, P.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 30 (1909), 43, 499. (22, 351) Dust shrubs with sulfur.

**FIG**Canker (*Libertella*)

DALLIMORE, W.

Jour. Bd. Agr. (London), 17 (1910), 1, 47. (23, 454) Cut out infection and burn. Coat wounds with tar.

*Macrophoma*

WOLF, F. A.

Ann. Mycol., 9 (1911), 6, 622. (26, 449) Remove and burn all diseased twigs and branches early in the season.

**FLAX**Wilt (*Fusarium*)

DALLIMORE, W.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 9 (1913), 335. (30, 648) A continual rotation of crops is recommended.

**GINSENG**Black Rot (*Rhizoctonia*)

OSNER, G. A.

Proc. Ind. Acad. Sci., 1911, 355. (29, 751) Destroy affected parts and apply Bordeaux.

RANKIN, W. H.

Spec. Crops, n. ser., 8 (1909), 87, 208. (22, 246)

Blight (*Alternaria*)

HOWITT, J. E.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, 38 (1912), 29., (30, 649)

WHETZEL, H. H.

Spec. Crops, n. ser., **11** (1912), 117, 91. (27, 446) 3-3-50 Bordeaux recommended. Lime sulfur found injurious.

————— and RANKIN, W. H.

Spec. Crops, n. ser., **9** (1910), 93, 327. (23, 547) Bordeaux and Paris green found effective.

————— and ROSENBAUM, J.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 250. (27, 649)

Fiber Rot (*Thielavia*)

WHETZEL, H. H.

Spec. Crops, n. ser., **8** (1909), 88, 229. (22, 454)

————— Spec. Crops, n. ser., **8** (1909), 84, 143. (21, 643) Reduce alkalinity of the soil.

————— and OSNER, G.

Spec. Crops, n. ser., **9** (1910), 97, 411. (24, 153) Reduce alkalinity of the soil by applying acid phosphate.

Root Rot (*Sclerotinia*)

RANKIN, W. H.

Phytopath., **2** (1912), 1, 28. (27, 247) Eradicate affected roots. Disinfect soil with steam or formalin.

GOOSEBERRY

Dieback (*Sclerotinia*)

SALMON, E. S.

Jour. Bd. Agr. (London), **17** (1910), 1, 1. (23, 453) Remove and burn all diseased bushes.

Leaf Spot (*Glavosporium*)

LÜSTNER, G.

Amtsbl. Landw. Kammer, Wiesbaden, **91** (1909), 15, 102; 16, 107. (22, 746) Bordeaux recommended.

Mildew (*Sphaerotheca*)

DOROGIN, G.

Ztschr. Pflanzenkrank., **23** (1913), 6, 334. (31, 546) Remove and destroy in autumn all parts of plants suspected of being diseased. Follow immediately and again in early spring by spraying plants and earth with 3-percent iron-sulfate solution.

ERIKSSON, J.

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., **6** (1908), 11, 121. (20, 1044)

Deut. Obstbau Ztg., 1909, 22-23, 340; abs. in Centbl. Bakt. (etc.), 2 Abt., **26** (1910), 4-5, 110. (22, 747) Select resistant varieties, and prune and burn infected shoots in fall.

FOEX, E.

Jour. Soc. Nat. Hort. France, 4 ser., **14** (1913), 775; abs. in Jour. Agr. Prat., n. ser., **26** (1913), 49, 717. (30, 750) Cut and burn all affected parts;

turn the soil; spray in autumn with 3-percent Bordeaux and in spring and summer with .2-percent potassium sulfid.

FRON, G.

Ann. Inst. Nat. Agron., 2 ser., 8 (1909), 1, 131. (21, 448)

HEGYI, D.

Rev. Phytopath. Appl., 1 (1914), 22-23, 30. (31, 843) Bordeaux applied once or twice during winter at 5-percent strength and in early spring at 1-percent strength recommended.

HILTNER, L., and KORFF

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., 11 (1913), 6, 73. (29, 850)

KÖCK, G.

Verhandl. K. K. Zool. Bot. Gesell. Wien, 59 (1909), 1-2, 48; 3-4, 49; abs. in Centbl. Bakt. (etc.), 2 Abt., 25 (1909), 19, 519. (22, 743)

Separate from Obstzüchter, 8 (1913). (31, 749) Cut and burn all infected shoots in autumn. Spray with lime sulfur in autumn and again just before foliage appears. Apply sulfur liberally to the disease at any time.

LEMCKE, A.

Separate from Georgine, Land u. Forstw. Ztg., 1909, 39. (22, 348) One-half percent solution of potassium sulfid recommended.

LIND, G.

K. Landtbr. Akd. Handl. och Tidskr., 48 (1909), 1, 33. (22, 247)

LONG, H. C.

Gard. Chron., 3 ser., 52 (1912), 1354, 421. (28, 650) In autumn cut and burn all infected parts. Early in season spray with copper-sulfate solution and later with potassium sulfid.

LÜSTNER, G.

Amtsbl. Landw. Kammer, Wiesbaden, 91 (1909), 15, 102; 16, 107. (22, 746) Bordeaux recommended.

MARCHAL, E.

Ztschr. Pflanzenkrank., 20 (1910), 4, 234. (23, 551) Spray with 35-percent solution of lime sulfur and burn badly diseased branches and canes.

MIDDLETON, T. H.

Bd. Agr. and Fisheries (London), Intel. Div. Ann. Rpt. Proc. 1909-10, 5. (25, 247) In fall or winter remove and burn all infected parts.

Bd. Agr. and Fisheries (London), Ann. Rpt. Intel. Div. 1910-11, pt. 2, 4. (27, 353) Spraying and pruning effective.

ÖBERSTEIN, O.

Ztschr. Pflanzenkrank., 20 (1910), 8, 449. (24, 649)

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, 1907, 16, 267. (20, 845)

Jour. Southeast Agr. Col. Wye, 1909, 18, 271. (25, 248) To prevent spread of disease in summer time, spray with potassium sulfid.

SALMON, E. S.

Proc. Assoc. Econ. Biol., **1** (1909), 4, 150. (21, 748)

————— and WRIGHT, C. B. W.

Jour. Bd. Agr. (London), **19** (1913), 12, 994. (29, 249)

STEFFEN

Prakt. Rathgeber Obst u. Gartenbau, 1909, 257; abs. in Ztschr. Landw. Versuchsw. Österr., **13** (1910), 1, 58. (23, 353) Cut and burn affected canes. Spray every ten days with solution of 700 grams potassium sulfid and 100 liters water. Just before leaves appear apply mixture of Bordeaux and potassium sulfid.

SWINGLE, D. B.

Mont. Sta. Circ. **37** (1914). (31, 644)

VINSON, R. S.

Jour. Southeast Agr. Col. Wye, 1911, 20, 427. (28, 448) Spray and prune.

WAGNER

Landw. Ztschr. Rheinprovinz, **11** (1910), 35, 527. (24, 452) During winter cut and burn all infected parts.

WILLIAMS, C. M.

Ann. Rpt. Quebec Soc. Protec. Plants (etc.), **3** (1910-11), 80. (26, 345) Lime sulfur recommended. Potassium sulfid and Bordeaux to be relied upon. (ANON.)

Dept. Agr. and Tech. Instr. Ireland Jour., **8** (1908), 3, 479. Remove and burn affected parts and spray with Bordeaux.

(ANON)

Jour. Bd. Agr. (London), **16** (1909), 2, 117. (21, 447) Spray thoroly; prune and burn all affected shoots.

## GRAPE

### Diseases, General

BIOLETTI, F. T.

Cal. Sta. Bul. **197**. (20, 548)

DE CASTELLA, F.

Jour. Dépt. Agr. Victoria, **9** (1911), 6, 394; 7, 462; 9, 651; 10, 673. (26, 244)

MOLZ, E.

Ber. K. Lehranst. Wein, Obst u. Gartenbau Geisenheim, 1907, 316. (21, 52)

NAZARI, V.

Staz. Sper. Agr. Ital., **42** (1909), 9, 609. (23, 650)

### Anthracnose

DEGRULLY, L.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **35** (1914), 2, 33. (31, 346) Spray with solution of 8 parts of sulfuric acid and from 10 to 15 parts of iron sulfate to 100 parts of water.

ZACHAREWICZ, E.

Rev. Vit., **39** (1913), 1015, 760. (29, 849) Powdered lime, cement, and mineral superphosphate (2-1-1 by weight) applied three times at intervals of ten days has been found effective.

Anthracnose (*Glauosporium*)

BOS, J. RITZEMA

Tijdschr. Plantenziekten, **15** (1909), 3-5, 95. (23, 353)Anthracnose (*Sphaceloma*)

HAWKINS, L. A.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 105. (28, 649) Prune and spray with lime sulfur when dormant. Apply Bordeaux after winter spraying.

PEROLD, A. I.

Agr. Jour. Cape Good Hope, **37** (1910), 4, 370. (24, 350) Dust mixture of lime and sulfur on vines in summer.Apoplexy (*Polyporus*)

RAVAZ, L.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 45, 574. (22, 247) Cut out diseased tissues and cover wounds with tar.

VINET, E.

Rev. Vit., **32** (1909), 835, 676. (22, 651) Cut out diseased tissues and cover wounds with tar.Black Rot (*Guignardia*)

CAPUS, J.

Bul. Mens. Off. Renseig. Agr. (Paris), **10** (1911), 4, 456. (25, 550) Bordeaux and Burgundy mixtures recommended.

HAWKINS, L. A.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 65. (24, 50) Disease can be controlled with five applications of 4-3-50 Bordeaux, soap being used in final application.

LEROU, J.

Rev. Vit., **37** (1912), 957, 526. (27, 546)

PRUNET, A.

Rev. Vit., **39** (1913), 1000, 228. (29, 349) Spray with solution of copper sulfate or solution of sulfuric acid until bloom appears.

RAVAZ, L.

Ann. Sci. Agron., 3 ser., **3** (1908), 2, 179. (20, 949) Spray with copper fungicides every ten days during early part of season.

REDDICK, D.

West N. Y. Hort. Soc. Proc., **54** (1909), 127. (22, 651)

SHEAR, C. L., MILES, G. F., and HAWKINS, L. A.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 155. (22, 50) 4-3-50 Bordeaux or copper acetate, 1 pound to 50 gallons of water, recommended.

SOURSAC, L.

Ann. École Nat. Agr. Montpellier, n. ser., **8** (1908), 2, 151; **8** (1909), 3, 161. (21, 52)

TAFT, L. R.

Mich. Sta. Rpt. 1909, 152. (22, 651) Spray with 4-4-50 Bordeaux in early spring. If necessary apply 2-1-50 Bordeaux after July 15.

WILSON, C. S., and REDDICK, D.

N. Y. (Cornell) Sta. Bul. 266. (21, 344) Plow to cover all rotten clusters and leaves, keep down weeds, keep vines off ground, and spray thoroly with 5-5-50 Bordeaux.

### Chlorosis

BERNÁTZKY, J.

Bul. Inst. Cent. Ampélol. Roy. Hongrois, 1 (1906), 8. (21, 551)

CHANCRIN, E.

Jour. Agr. Prat., n. ser., 23 (1912), 22, 683; 23, 715. (27, 850)

### Crown Gall

HEDGCOCK, G. G.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 183. (23, 650) Remove and burn diseased vines. Deep planting in arid regions recommended.

### Gray Rot (*Botrytis*)

ISTVANFFI, G.

Ann. Sci. Agron., 3 ser., 3 (1908), 2, 196. (20, 949)

LAFFORGUE, G.

Rev. Vit., 39 (1913), 1001, 245; Prog. Agr. et Vit. (Ed. l'Est-Centre), 34 (1913), 30, 104. (29, 349) Powdered lime, 85 percent, and powdered potassium permanganate recommended.

THOURET, A., and VIDAL, J. L.

Rev. Vit., 40 (1913), 1023, 117. (29, 849)

TOTAL, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 30 (1909), 43, 499. (22, 349) Apply Bordeaux and soap when grapes reach full size.

ZACHAREWICZ, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 30 (1909), 48, 664. (22, 454) Alternate applications of a liquid fungicide (copper sulfate, powdered soap, and water) followed when dry by sulfur, recommended.

Rev. Vit., 34 (1910), 887, 671. (24, 649)

### Mildew

ANDRÉ, S.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 31 (1910), 33, 198. (24, 51)

BRUNET, R.

Rev. Vit., 34 (1910), 879, 421. (24, 452) Alternate spraying with Bordeaux and dusting vines and fruit with sulfur to which has been added 10 percent of copper sulfate, proved efficient.

BURNS, W.

Dept. Agr. Bombay Bul. 36 (1910). (24, 649) Three applications of 3-2-25 Bordeaux followed by a fourth application of 3-2-40 Bordeaux recommended.

CADORET, A.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 31 (1910), 31, 137. (24, 50)

CADORET, A.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 18, 557. (29, 551) For early attack spray with Bordeaux or copper acetate twice at intervals of fifteen days. For June attacks follow the above spraying with a powder of bolted lime, sulfur, and copper sulfate, 60-30-10 respectively.

GERVIES, A.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **31** (1910), 35, 256. (24, 51) Alternate spraying with copper-sulfate solution and dusting with mixture of copper sulfate and sulfur recommended.

LABERGERIE

Jour. Agr. Prat., n. ser., **20** (1910), 38, 369. (24, 250) Bordeaux recommended.

MAISONNEUVE, P.

Rev. Vit., **34** (1910), 889, 709. (24, 649) Bordeaux recommended over copper oxychlorid.

SZIGETHI-GYULA, A., and DUPUIS, L.

Bul. Inst. Cent. Ampélol. Roy. Hongrois, **1** (1906), 13. (21, 551)

VERMOREL, V., and DANTONY, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **31** (1910), 30, 101; abs. in Rev. Vit., **34** (1910), 866, 71. Spray with solution of 20 grams of silver nitrate and 300 grams of white soap in 100 liters of water.

ZACHAREWICZ, E.

Rev. Vit., **34** (1910), 887, 671. (24, 649)

Mildew, Downy (*Plasmopara*)

BELLE and FONDARD

Rev. Vit., **32** (1909), 812, 47. (21, 644)

BOLLE, J.

Ztschr. Landw. Versuchsw. Österr., **16** (1913), 4, 299. (30, 448)

BRETSCHNEIDER, A.

Ztschr. Landw. Versuchsw. Österr., **13** (1910), 3, 135. (23, 651)

Ztschr. Landw. Versuchsw. Österr., **14** (1911), 5, 806. (25, 751)

Monatsh. Landw., **5** (1912), 5, 138. (27, 652)

Ztschr. Landw. Versuchsw. Österr., **15** (1912), 2, 147. (27, 652)

BURNS, W.

Dept. Agr. Bombay Bul. 45 (1911). (27, 49) Thoro and timely spraying with Bordeaux recommended.

CAORS, C.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **33** (1912), 5, 140. (26, 750) Spray, taking care to reach under sides of leaves.

CAPUS, J.

Rev. Vit., **39** (1913), 1013, 693. (29, 849)

CHAPPAZ, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 10, 285. (20, 1139)

CHUARD, E.

Compt. Rend. Acad. Sci. (Paris), **150** (1910), 13, 839. (23, 453) Bordeaux, 2-percent strength, recommended.

FAES, H.

Chron. Agr. Vaud., **21** (1908), 8, 189; 9, 207. (20, 548) Spray with 2-percent Bordeaux every fifteen days First application, 50 gallons per acre; subsequent applications, 75 to 100 gallons per acre.

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Terre Vaud., **1** (1909), 9, 85. (23, 251)

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Rev. Vit., **36** (1911), 933, 489; 934, 517; 935, 545. (26, 550) Direct fungicide to under sides of leaves.

GERNECK, R.

Weinbau u. Weinhandel, **30** (1912), 47, 498. (29, 449) Early and timely spraying with 1-percent Bordeaux, repeated whenever rain falls, is recommended.

GOUTHIERE, H.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 17, 507. (21, 245)

GUICHARD, J.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 21, 621. (22, 349) Copper oxychlorid applied (1) about flowering period and (2) immediately after flowering period, is very effective.

HEIN, W. H.

Insect Pest and Plant Disease Bur. Nebr., Div. Bot. Circ. 4. (21, 643)

HÉRON, G.

Jour. Agr. Prat. Vit. et Écon. Rurale Midi France, **109** (1913), 5, 192. (31, 151) Burgundy mixture recommended.

KRANKOFF, J. J.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **33** (1912), 11, 334. (27, 49) Early and repeated spraying with Bordeaux recommended.

LEROU, J.

Rev. Vit., **37** (1912), 957, 526. (27, 546)

LÜSTNER, G.

Ber. K. Lehranst. Wein, Obst u. Gartenbau Geisenheim, 1908, 111. (22, 349) One-percent Cucasa or copper soda recommended.

MEISSNER, R.

Weinbau u. Weinhandel, **26** (1908), 43, 387. (20, 549) Two-percent Bordeaux recommended.

MÜLLER, K.

Grossh. Bad. Landw. Vers. Anst. Augustenb. Flugbl., **1** (1913), 12; in Ber. Grossh. Bad. Landw. Vers. Anst. Augustenb., (1912). (31, 346)

MÜLLER, H., and THURGAU

Weinbau u. Weinhandel, **29** (1911), 29, 346; 46, 521. (26, 450) Spray under sides of leaves with Bordeaux.



PEROLD, A. J.

Agr. Jour. Cape Good Hope, **37** (1910), 4, 370. (24, 350) Apply flowers of sulfur.

SAURET, L.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **35** (1914), 19, 582. (31, 544) Apply liquid fungicide containing 2 kilograms copper sulfate and 1 kilogram of lime or carbonate of soda.

SCHELLENBERG, H.

Landw. Jahrb. Schweiz, **22** (1908), 5, 284. (20, 757)

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Landw. Jahrb. Schweiz, **26** (1912), 6, 420. (28, 152) Bordeaux recommended.

THIÉBAUT, V.

Rev. Vit., **33** (1910), 862, 691. (23, 746) Apply mixture of 1 part quicklime, 2 parts sublimed sulfur, and 2 parts copper sulfate.

ZACHAREWICZ, E.

Rev. Vit., **34** (1910), 887, 671. (24, 649)

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Rev. Vit., **40** (1913), 1025, 171. (30, 150) Copper-sulfate mixtures recommended.

(ANON.)

Weinbau u. Weinhandel, **26** (1908), 20, 193. (21, 54) Tenax, (consisting of equal proportions of copper sulfate, clay-treated sulfuric acid, and soda) in a 1-percent solution is recommended.

#### Mildew, Powdery (*Uncinula*)

CHAPPAZ, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 18, 532. (22, 247) Combinations of treatments of sulfur and copper recommended.

DE ISTVÁNFFI, G.

Bul. Inst. Cent. Ampélol. Roy. Hongrois, **1** (1906), 14. (21, 551) A mixture of bisulfite of soda and sulfur recommended.

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Bul. Inst. Cent. Ampélol. Roy. Hongrois, **1** (1906), 9. (21, 551) Late autumn spraying recommended.

LEROU, J.

Rev. Vit., **37** (1912), 957, 526. (27, 546)

#### Necrosis (*Fusicoccum*)

REDDICK, D.

N. Y. (Cornell) Sta. Bul. 263. (21, 148) Eradicate disease by removing and burning all diseased parts. To prevent new infection, spray in May or June.

#### Pourridié

SZIGETHI-GYULA, A.

Bul. Inst. Cent. Ampélol. Roy. Hongrois, **1** (1906), 16. (21, 550) Lime at the rate of 2 kilograms or 10 liters of milk of lime to a vine recommended.

Red Spot (*Pseudopeziza*)

DÜMMLER

Wchnbl. Landw. Ver. Baden, 1910, 415; abs. in Ztschr. Landw. Versuchsw. Österr., **13** (1910), 6, 597. (24, 351) Two-percent Bordeaux recommended.

LÜSTNER, G.

Ber. K. Lehranst. Wein, Obst u. Gartenbau Geisenheim, 1910, 175. (26, 144) Manure applied to light sandy soil increases resistance.

MÜLLER-THURGAU, H.

Landw. Jahrb. Schweiz, **26** (1912), 6, 313. (28, 55) Bordeaux recommended.

Root Rot (*Pestalozzia*)

WOLF, F. A.

Nebr. Sta. Rpt. 1907, 69. (20, 451)

## Sun Scald

PACOTTET, P.

Rev. Vit., **32** (1909), 813, 57. (23, 48) Prune judiciously and whitewash glass of greenhouse.

White Rot (*Coniothyrium*)

DEGRULLY, L.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 36, 289. (30, 247) Spray with fungicide high in copper content.

ISTVANFFI, G.

Ann. Sci. Agron., 3 ser., **3** (1908), 2, 183. (20, 950) Apply 3-percent Bordeaux. Later dust with powder containing copper and sulfite of soda. Begin application immediately after flowering.

## GRAPE FRUIT

## Scab

FAWCETT, G. L.

Porto Rico Prog., **6** (1914), 22, 6. (31, 152) Remove and burn infected parts. Bordeaux will control disease but destroys beneficial fungi which hold scale insects in check.

## HEMP

Anthracnose (*Colletotrichum*)

SHAW, F. J. F.

Agr. Jour. India, **8** (1913), 1, 65; abs. in Agr. News (Barbados), **12** (1913), 289, 174. (29, 346) Collect and burn diseased leaves and spray with Bordeaux.

## HEVEA

Dieback (*Glæosporium*)

PETCH, T.

Circs. and Agr. Jour. Roy. Bot. Gard., Ceylon, **4** (1910), 23, 307. (23, 552) Cut out diseased shoots and paint wounds with tar.

Leaf Disease (*Fusicladium*)

KUYPER, J.

Rec. Trav. Bot. Néerland., **8** (1911), 3-4, 371. (26, 651) Bordeaux recommended.

Pink Disease (*Corticium*)

BUTLER, E. J.

Ann. Rpt. Bd. Sci. Advice India, 1911-12, 124. (30, 845)

Root Disease (*Sphærostilbe*)

PETCH, T.

Circs. and Agr. Jour. Roy. Bot. Gard., Ceylon, **5** (1910), 8, 65. (25, 46)  
Dig up and destroy all diseased trees and roots. Isolate infected area by trenches one foot deep and treat ground with quicklime.

**HOLLYHOCK**Rust (*Puccinia*)

WEBB, G.

Gard. Chron., 3 ser., **50** (1911), 1288, 174. (26, 750) Dust powder on plants, in morning while dew is still on, three or four times during growing season. Powder should contain 1 bushel slaked lime, 1 bushel soot, 4 pounds flowers of sulfur, and 2 ounces finely powdered copper sulfate.

**HOP**Mildew (*Sphærotheca*)

BLODGETT, F. M.

N. Y. (Cornell) Sta. Bul. 328. (29, 346) Observe proper sanitation. Sulfur recommended.

**HYACINTH**Yellows (*Bacterium*)

SMITH, E. F.

Carnegie Inst. Washington Pub. 27, **2** (1911). (27, 44)

**IMMORTEL**

## Canker

SOUTH, F. W.

Agr. News (Barbados), **11** (1912), 263, 174. (27, 451) Cut out and burn diseased bark. Apply tar to wounds.

**LARCH**Canker, European (*Peziza*)

BORTHWICK, A. W.

Notes Roy. Bot. Gard. Edinb., 1909, 21, 23. (22, 548)

Scab (*Cladosporium*)

FIORI, A.

Bul. Soc. Bot. Ital., 1912, 8, 307. (29, 156) Remove and burn diseased parts and spray with Bordeaux.

**LAVATERA**Anthracnose (*Colletotrichum*)

CHITTENDEN, F. J.

Jour. Roy. Hort. Soc. (London), **35** (1909), 2, 213. (22, 454) Repeated sprayings with Bordeaux checked the disease.

**LEBBEK**

Diseases, General

BALLS, W. L.

Cairo Sci. Jour., **4** (1910), 41, 42. (23, 552)

**LEMON**

Cottony Mold

SMITH, C. O.

Cal. Cult., **35** (1910), 9, 196. (24, 48) Copper sulfate.

Gummosis (*Botrytis*)

FAWCETT, H. S.

Mo. Bul. Com. Hort. Cal., **2** (1913), 8, 601. (30, 51) Bordeaux mixture or paste recommended.

**LETTUCE**Drop (*Sclerotinia*)

BURGER, O. F.

Fla. Sta. Bul. 116. (29, 846) Remove and destroy diseased plants. Drench infected area with Bordeaux or copper sulfate. Rotate.

STEVENS, F. L.

Abs. in Science, n. ser., **33** (1911), 850, 941. (25, 548)

N. C. Sta. Bul. 217. (25, 846) Remove and destroy diseased plants. Apply Bordeaux or copper sulfate to places from which plants have been removed.

\_\_\_\_\_ and HALL, J. G.

Abs. in Science, n. ser., **31** (1910), 802, 752. (23, 452) Prevent formation of sclerotia by early destruction of affected plants.

\_\_\_\_\_ N. C. Sta. Tech. Bul. 8, 89. (26, 448)

Mildew, Downy (*Bremia*)

SCHNEIDER, N.

Rev. Hort. (Paris), **84** (1912), 21, 493. (28, 446) Cover ground with light dressing of charcoal.

**LILAC**Leaf Disease (*Pseudomonas*)

Güssow, H. T.

Gard. Chron., 3 ser., **44** (1908), 1146, 404. (20, 850) Cut and burn all diseased shoots.

Trunk Disease (*Polyporus*)

VON SCHRENK, H.

Ann. Mo. Bot. Gard., **1** (1914), **2**, 253. (31, 750) Disease enters thru holes made by borers. Kill borers, treat holes with antiseptic and plug. Burn diseased trunks.

**LOGANBERRY***Hendersonia*

(ANON.)

Jour. Bd. Agr. (London), **19** (1912), **2**, 124. (27, 448) Cut and burn all diseased canes. Spray with Bordeaux.

**MAGUEY**

Diseases, General

GANDARA, G.

Mem. y Rev. Soc. Cient. "Antonio Alzate," **25** (1908-09), 9-12, 293. (23, 151)

**MAIZE**Mildew, Downy (*Sclerospora*)

BUTLER, E. J.

Mem. Dept. Agr. India, Bot. Ser., **5** (1913), **5**, 275. (31, 51) Prevent the formation of oospores. Remove and burn all diseased plants before they wilt.

Smut (*Sorosporium*)

MCALPINE, D.

Jour. Dept. Agr. Victoria, **8** (1910), **5**, 290. (23, 647) Disinfect seed with copper sulfate or formalin.

**MANDARIN**

Black Spot

(ANON.)

Agr. Gaz. N. S. Wales, **25** (1914), **8**, 684. (31, 843) Prune and spray trees and ground with Bordeaux.

**MANGO**Bloom Blight (*Glæosporium*)

CARDIN, P. P.

Cuba Rev., **8** (1910), **5**, 28. (24, 49) Two applications of Bordeaux at intervals of two weeks recommended.

**MELON**Canker (*Micosphaarella*)

MIDDLETON, T. H.

Bd. Agr. and Fisheries (London), Ann. Rpt. Intel. Div. 1910-11, pt. 2, 54. (27, 353) Spray with Bordeaux and disinfect houses thoroly in winter.

Mildew (*Pseudoperonospora*)

JARVIS, C. D.

Conn. Storrs Sta. Rpt. 1908-09, 31. (22, 743) 2-2-50 Bordeaux recommended.

KÖCK, G.

Verhandl. K. K. Zool. Bot. Gesell. Wien, **59** (1909), 1-2, 48; 3-4, 49; abs. in Centbl. Bakt. (etc.), 2 Abt., **25** (1909), 19-25, 519. (22, 743)

Wilt (*Bacillus*)

TROOP, J., and WOODBURY, C. G.

Ind. Sta. Rpt. 1908, 30. (20, 1044)

**MUSKMELON**

## Rust

TROOP, J., and WOODBURY, C. G.

Ind. Sta. Rpt. 1908, 35. (20, 1044) Five applications of 5-5-50 Bordeaux recommended; first application when rust spots begin to appear, followed by others at ten-day intervals.

Soft Rot (*Bacillus*)

GIDDINGS, N. J.

Vt. Sta. Bul. 148. (23, 349) Spray with Bordeaux. Support melons above ground and remove all traces of infection.

**MINT**Rust (*Puccinia*)

NOFFRAY, E.

Jour. Agr. Prat., n. ser., **19** (1910), 5, 150. (23, 350) Spray with Bordeaux and burn infected leaves late in the fall.

**MULBERRY**Leaf Spot (*Sphærella*)

AVERNA-SACCÀ, R.

Bol. Agr. (São Paulo), 12 ser., 1911, 9-10, 727. (27, 547) Both Bordeaux and copper sulfate recommended.

**NARCISSUS**Dry Rot (*Fusarium*)

MASSEE, G.

Jour. Bd. Agr. (London), **20** (1914), 12, 1091. (31, 646) Kill secondary spores during germination by working into soil a dressing of kainit or potassium sulfate. Rotate with non-susceptible plants.

**OAK**Mildew (*Oidium*)

CUIF, E.

Bul. Soc. Sci. Nancy, 3 ser., **12** (1911), 1, 102. (26, 451) Dust seedlings with sulfur two or three times during season.

D'ALMEIDA, J. V.

Rev. Agron. (Portugal), **6** (1908), 3, 42. (23, 50)

KIRCHNER, O.

Allg. Forst u. Jagd Ztg., **85** (1910), 158. (23, 50)

KÖCK, G.

Österr. Forst u. Jagd Ztg., **28** (1910), 3, 18. (23, 50) Dust trees with powdered sulfur or spray with Bordeaux.

KÖVESSI, F.

1. Cong. Internat. Pathol. Comparée (Paris), 1912, **2**, Comp. Rend., **924** (31, 845) Flowers of sulfur recommended.

NEGER, F. W.

Tharand. Forstl. Jahrb., **62** (1911), 1, 1. (27, 253) Spray once or twice with lime sulfur.

VON TUBEUF, K.

Naturw. Ztschr. Forst u. Landw., **7** (1909), **2**, 119; abs. in Bot. Centbl., **110** (1909), **24**, 627. (23, 50) Hot-water treatment of seeds recommended.

#### Yellow Spot

MAIGE, A.

Bul. Sta. Forest Nord. Afrique, **1** (1912), 1, 10. (31, 247)

### OATS

#### Diseases. General

STÖRMER, K., and KLEINE, R.

Illus. Landw. Ztg., **32** (1912), 51, 471. (28, 149)

#### Blight (*Pseudomonas*)

MANN, T. F.

Ohio (Wooster) Sta. Bul. 210. (22, 453) Select resistant varieties.

#### "Dry Leaf"

EDINBURGH and EAST OF SCOTLAND COLLEGE OF AGRICULTURE

Rpt. **30** (1913), **22**; abs. in Jour. Bd. Agr. (London), **20** (1914), **11**, 1010. (31, 243) The use of such fertilizers as ammonium sulfate, superphosphate, and manganese sulfate, lessens disease.

#### Mildew (*Erysiphe*)

STÖRMER, K., and KLEINE, R.

Deut. Landw. Presse, **39** (1912), 51, 599. (28, 346) The use of phosphorus, potassium, and calcium salts recommended.

#### *Scolecotrichum*

NILSSON-EHLE, H.

Abs. in Bot. Centbl., **111** (1909), **7**, 165. (23, 46)

#### Smut (*Ustilago*)

Goss, A.

Ind. Sta. Rpt. 1908, 17. (20, 1043) The use of formalin recommended.

## Yellows

CLAUSEN, H.

Mitt. Deut. Landw. Gesell., **25** (1910), 44, 631. (24, 449) A direct application of lime should be omitted; ammonium sulfate should be used in place of nitrate of soda; phosphoric acid should be in form of superphosphate in place of "Thomas slag"; and soil after planting should be thoroly rolled down.

**OLEANDER**

Bacteriosis

TONELLI, A.

Ann. R. Accad. Agr. Torino, **55** (1912), 383. (30, 751) Cut out cankers and cover wounds with some good fungicide.

**OLIVE**

Diseases, General

CUBONI

Ann. Agr. (Italy), 1908, 256, 83. (20, 950)

Sooty Mold (*Meliola*)

VIDAL, D.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 24, 730. (23, 250) Spray trees twice during season with 2-percent Bordeaux. To every 100 liters of Bordeaux add 1 liter of turpentine:

**ONION**Mold (*Macrosporium*)

RAMIREZ, R.

Bol. Dir. Gen. Agr. (Mexico), Rev. Agr., **2** (1912), 5, 413. (29, 245) Lime sulfur, 1-1-100, recommended.

Smut (*Urocystis*)

JONES, L. R., and VAUGHN, R. E.

Wis. Sta. Bul. **240** (1914). (31, 840) Disinfect seed with formalin.

PAMMEL, L. H., and KING, C. M.

Ia. Sta. Bul. **131**. (27, 445)

REDDICK, D.

West N. Y. Hort. Soc. Proc., **58** (1912), 194. (29, 245)

STONE, G. E.

Mass. Sta. Circ. **21**. (23, 743) Treat seed before planting with solution of 1 pound of formalin to 30 gallons of water.

**ORANGE**

Diseases, General

GANDARA, G.

Estac. Agr. Cent. (Mexico), Bol. **31**, 1, 43. (24, 157)



## Dieback

FLOYD, B. F.

Fla. Sta. Rpt. 1913, 27. (31, 749) Spray twice in spring with 5-5-50 Bordeaux.

## Exanthema

BITTLEBANK, C. C.

Jour. Dept. Agr. Victoria, 10 (1912), 7, 401. (27, 850) Avoid nitrogenous manures. Plow under green crops previously manured with superphosphates.

## Rot

SAVASTANO, L.

R. Staz. Sper. Agrum. e Frutticol. Acireale, Bol. 9 (1912). (31, 646) Timely tree surgery and substitution of sound young trees recommended.

## ORCHID

Bacterial Disease (*Bacillus*)

HORI, S.

Centbl. Bakt. (etc.), 2 Abt., 31 (1911), 1-4, 85. (26, 650) Apply 1-percent solution of corrosive sublimate with soft sponge. Avoid excess of water.

Leaf Spot (*Hypodermium*)

BROOKS, F. T.

Gard. Chron., 3 ser., 50 (1911), 1281, 27. (25, 755) Sponge leaves with a dilute solution of potassium permanganate.

## PALM

## Diseases, General

COLEMAN, L. C.

Ann. Mycol., 8 (1910), 6, 591; Dept. Agr. Mysore, Mycol. Ser. Bul. 2, 1910. (24, 650)

Bud Rot (*Pythium*)

BUTLER, E. J.

Mem. Dept. Agr. India, Bot. Ser., 3 (1910), 5, 221. (24, 351) Systematic cutting and destruction of all diseased trees recommended.

## PEACH

## Diseases, General

ESSIG, E. O.

Mo. Bul. Com. Hort. Cal., 1 (1912), 8, 337. (27, 652)

NORTON, J. B. S.

Rpt. Md. State Hort. Soc., 13 (1910), 138. (28, 148)

ROLFS, F. M.

Ann. Rpt. Mo. Bd. Hort., 2 (1908), 63. (22, 150)

WORSHAM, E. L., and REED, W. V.

Ga. Bd. Ent. Bul. 26. (20, 757)

Brown Rot (*Sclerotinia*)

BARRE, H. W.

S. C. Sta. Rpt. 1910, 27. (24, 745) Two applications of self-boiled lime sulfur (8-8-50) recommended.

MCCUE, C. A.

Del. Sta. Bul. 85. (21, 244) Lime-sulfur wash recommended.

MORRIS, O. M.

Okla. Sta. Rpt. 1908, 16. (20, 950) Four applications of Bordeaux recommended.

## OKLAHOMA

Okla. Sta. Rpt. 1908, 78. (20, 950) Both Bordeaux and ammoniacal copper carbonate recommended.

SCOTT, W. M., and QUAINANCE, A. L.

Better Fruit, 5 (1910), 1, 19. (23, 745) Apply solution of 2 pounds of arsenate of lead to 50 gallons of lime sulfur. Repeat one month after petals fall and again one month before fruit ripens.

STEWART, J. P.

Proc. State Hort. Soc. Pa., 52 (1911), 181; Proc. Amer. Pomol. Soc., 32 (1911), 281. (25, 352)

Crown Gall (*Pseudomonas*)

SWINGLE, D. B.

Mont. Sta. Circ. 37 (1914). (31, 644)

Leaf Curl (*Exoascus*)

ARNAUD, G.

Rev. Phytopath., 1 (1913), 2, 24; abs. in Riv. Patol. Veg., 6 (1913), 7, 218. (30, 353) Bordeaux or lime sulfur recommended.

BLAKE, M. A., and FARLEY, A. J.

N. J. Sta. Rpt. 1908, 53. (22, 150) Remove and destroy affected parts. Apply Bordeaux or lime sulfur.

BOLLE, J.

Ztschr. Landw. Versuchsw. Österr., 16 (1913), 4, 299. (30, 448)

FARLEY, A. J.

N. J. Sta. Circ. 29. (30, 750) Thoro application of lime sulfur before buds open recommended.

GASSNER, G.

Rev. Asoc. Rural Uruguay, 37 (1908), 10, 546. (22, 748)

MANARESI, A.

Coltivatore, 56 (1910), 7, 208. (23, 151)

QUINN, G.

Jour. Dept. Agr. So. Aust., 15 (1911), 1, 58. (26, 144) Two applications of Burgundy or Bordeaux recommended

Jour. Dept. Agr. So. Aust., 17 (1913), 1, 28. (30, 50) Burgundy most effective.

SWINGLE, D. B.

Mont. Sta. Circ. 37. (31, 644)

WALLACE, E.

Rpt. Niagara Sprayer Co. Fellowship, **1** (1909). (22, 652) Lime sulfur better than Bordeaux.

WEEKS, C. B.

Mo. Bul. Com. Hort. Cal., **1** (1912), 8, 359. (28, 152) Bordeaux 7-7-50 in late fall, 4-4-50 in spring, and 2-2-50 after leaves appear, recommended.

ZAULI, G.

Bul. R. Soc. Toscana Ort., 3 ser., **12** (1907), 11, 325. (20, 548) Apply solution of copper sulfate, lime, and ammonium chlorid at time buds open. If rainy give a second application.

#### Little Peach

BLAKE, M. A.

N. J. Sta. Bul. 226. (22, 748)

CAESAR, L.

Ont. Dept. Agr. Bul. 185. (24, 250) Destroy affected trees.

#### Rust (*Puccinia*)

PERRONNE, P.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **35** (1914), 2, 57. (31, 53)

#### Scab (*Cladosporium*)

BARRE, H. W.

S. C. Sta. Rpt. 1910, 27. (24, 745)

BLAKE, M. A., and FARLEY, A. J.

N. J. Sta. Bul. 236. (25, 455) Lime sulfur 1-150 or 1-175 recommended. Stronger solutions unsafe.

EVANS, I. B. P.

Agr. Jour. Union So. Africa, **1** (1911), 5, 696. (25, 752) Bordeaux 5-5-50 three weeks before buds open, 4-4-50 just after fruit is setting, and 4-4-100 when fruit is half grown.

SCOTT, W. M., and AYRES, T. W.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 174. Lime sulfur recommended.

STEWART, J. P.

Proc. State Hort. Assoc. Pa., **52** (1911), 181; Proc. Amer. Pomol. Soc., **32** (1911), 281. (25, 352) Bordeaux or lime sulfur and lead arsenate recommended.

#### Yellows

BLAKE, M. A.

N. J. Sta. Bul. 226. (22, 748)

HUTCHINS, E.

Better Fruit, **5** (1910), 1, 64. (23, 746) For three years uproot and burn all trees showing signs of yellows.

### PEANUT

#### Diseases, General

SOUTH, F. W.

West Indian Bul. 11 (1911), 3, 157. (25, 348)

## PEAR

## Diseases, General

STEVENS, F. L.

N. C. Sta. Bul. 206. (23, 453)

STEWART, F. C.

West N. Y. Hort. Soc. Proc., 56 (1911), 61. (26, 55)

SWINGLE, D. B.

Mont. Sta. Circ. 37 (1914). (31, 644)

## Chlorosis

RIVIÈRE, G., and BAILHACHE, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 33 (1912), 11, 340. (27, 48)  
Application of solution of pyrophosphate of iron with ammonium citrate thru holes in the base of trunk change chlorotic appearance to healthy one.

SCHELLENBERG, H.

Landw. Jahrb. Schweiz, 26 (1912), 6, 432. (28, 151)

Fire Blight (*Bacillus*)

GAMMON, E. A.

Mo. Bul. Com. Hort. Cal., 1 (1912), 2, 37. (27, 353) Prune carefully and disinfect thoroly.

HALL, J. F.

Wash. Sta. Popular Bul. 65 (1914), postcard. (31, 749)

HALL, J. G.

Wash. Sta. Popular Bul. 56. (29, 848) Remove and burn all diseased portions of trees.

JACKSON, H. S.

Ore. Sta. Circ. 7. (23, 454)

PICKETT, B. S.

Ill. Sta. Circ. 172 (1914). (31, 644) Remove and destroy all infected trees, which carry disease over winter.

SACKETT, W. G.

Southwest Stockman, 28 (1909), 15. (22, 46)

SWINGLE, D. B.

Mont. Sta. Circ. 2. (23, 352) Remove and burn all infected parts. Avoid watering to excess.

Rust (*Gymnosporangium*)

OSTERWALDER, A.

Schweiz. Ztschr. Obst u. Weinbau, 1912, 311; abs. in Ztschr. Landw. Versuchsw. Österr., 15 (1912), 12, 1303. (29, 50) Destroy all neighboring junipers.

Scab (*Venturia*)

LOUNSBURY, C. P.

Agr. Jour. Cape Good Hope, 33 (1908), 1, 16. (20, 452)

NICHOLLS, H. M.

Agr. Gaz. Tasmania, **21** (1913), 10, 387. (30, 541) Plow under fallen leaves early in fall, harrow surface and leave undisturbed until November 15. Spray leaves early in October with Bordeaux or Burgundy mixture or lime sulfur, adding one pound of wheat flour to each gallon of fungicide to promote spreading and adhesion.

PERRONNE, P.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **35** (1914), 2, 57. (31, 53)

SMITH, R. E.

Northwest Pacific Farmer, **39** (1909), 51, 1. (22, 350) Spray trees in February or March with lime sulfur; when buds begin to swell spray with strong Bordeaux; after fruit sets give two applications of 5-5-50 Bordeaux to which a little arsenic has been added.

#### Sun Scald

LÜSTNER, G.

Ber. K. Lehranst. Wein, Obst u. Gartenbau Geisenheim, 1909, 123. (24, 156)

### PECAN

#### Diseases, General

MILLER, H. K.

Amer. Fruit and Nut Jour., **7** (1913), 99, 12. (31, 245)

#### Scab (*Fusicladium*)

WAITE, W. D.

Science, n. ser., **33** (1911), 837, 77. (24, 452) Bordeaux recommended. Grow scab-resisting varieties.

### PEPPER

#### Anthracnose (*Colletotrichum*)

BANCROFF, C. K., and HUNTE, R. L.

Jour. Bd. Agr. Brit. Guiana, **7** (1914), 3, 139. (31, 542) Bordeaux recommended.

RIDLEY, H. N.

Agr. Bul. Straits and Fed. Malay States, **10** (1911), 10, 320. (26, 448) Remove and burn all infected spikes. Spray with Bordeaux.

### PINE

#### Blister Rust (*Cronartium*)

SPAULDING, P.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 206. (25, 457) Import no five-leaf pines or Ribes stock. Remove and burn all diseased trees.

STEWART, F. C.

West. N. Y. Hort. Soc. Proc., **58** (1912), 122. (29, 249) Isolate Ribes and other susceptible varieties; destroy promptly any signs of disease; prevent distribution of diseased pines, and do not plant black currants in the vicinity of nursery.

Leaf Cast (*Lophodermium*)

HAACK

Ztschr. Forst u. Jagdw., **43** (1911), 4, 329; 5, 402; 6, 481; abs. in Hedwigia, **51** (1911), 3, Beibl., 202. (26, 651) Spray in spring with weak solution of copper sulfate. Remove and burn all infection.

HERRMANN, E.

Naturw. Ztschr. Forst u. Landw., **8** (1910), 2, 105. (23, 751)

MAIRE, E.

Rev. Eaux et Forêts, **49** (1910), 15, 458. (24, 53) Copper sulfate recommended.

MAYR, H.

Forstw. Centbl., n. ser., **33** (1911), 1, 1; abs. in Hedwigia, **51** (1911), 3, Beibl., 204. (26, 651)

SCHANDER, R.

Vorträge Pflanzenschutz, Abt. Pflanzenkrank. Kaiser Wilhelms Inst. Landw. Bromberg, 1910, 1, 33. (23, 152)

Rust (*Peridermium*)

HAACK

Ztschr. Forst u. Jagdw., **46** (1914), 1, 3, (31, 153) Remove and destroy infection.

## PINEAPPLE

## Decay

(ANON.)

Agr. News (Barbados), **13** (1914), 318, 222. (31, 844) Cut off and sear stems with wax. Cool and dry fruit twenty-four hours before packing. Fumigate with formalin.

## PINK

Bud Rot (*Sporotrichum*)

MOLZ, E., and MORGENTHALER, O.

Ber. Deut. Bot. Gesell., **30** (1912), 9, 654. (28, 750) Ventilate hot-houses and destroy all infected buds. Avoid too high moisture content of air and soil, likewise use of swamp soil.

## PLUM

## Diseases, General

WHITMARSH, R. D.

Mass. Sta. Rpt. 1909, pt. 2, 65. (24, 252)

Black Knot (*Plowrightia*)

COONS, G. H.

Mich. Farmer, **140** (1913), 14, 425. (29, 155) Dilute commercial lime sulfur recommended.

Brown Rot (*Sclerotinia*)

MORRIS, O. M.

Okla. Sta. Rpt. 1908. 16. (20, 951) Four applications of half-strength Bordeaux recommended.

STONE, G. E.

Mass. Sta. Rpt. 1909, pt. 2, 65. (24, 252)

Leaf Spot (*Cylindrosporium*)

STEWART, V. B.

N. Y. (Cornell) Sta. Circ. 21 (1914). (30, 848) Bordeaux, 5-5-50, or lime-sulfur solution, 1 gallon to 50 gallons of water, recommended. Burning is prevented by the addition of granulated iron sulfate.

Rust (*Puccinia*)

BROOKS, F. T.

New Phytol., 10 (1911), 5-6, 207; Gard. Chron., 3 ser., 50 (1911), 1295, 292; abs in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, 2 (1911), 11-12, 2603. (27, 48) Eradicate *Anemone coronaria*, upon which the æcidium stage is found.

Scab (*Cladosporium*)

MACOUN, W. T.

Canada Expt. Farms Rpts., 1909, 126. (22, 350) Spray early with Bordeaux. When fruit sets use ammoniacal copper carbonate to prevent staining.

Silver Leaf (*Stereum*)

PICKERING, S. W.

Woburn Expt. Fruit Farm Rpt., 12 (1910); rev. in Gard. Chron., 3 ser., 48 (1910), 1246, 356. (24, 349) Remove and destroy all infection.

## POPLAR

### Canker

HOC, P.

Prog. Agr. et Vit. (Ed. l'Est-Centre), 30 (1909), 30, 116. (21, 645) Remove and destroy infected branches.

## POTATO

### Diseases, General

COOK, M. T.

Ann. Rpt. N. J. Bd. Agr., 40 (1912), 155. (30, 539)

N. J. Sta. Circ. 18. (29, 549)

\_\_\_\_\_ and MARTIN, G. W.

N. J. Sta. Circ. 33. (31, 52)

COONS, G. H.

Mich. Sta. Special Bul. 66 (1914). (31, 543)

FOEX, E., and PERRET, C.

Vie Agr. et Rurale, 3 (1914), 5, 129. (31, 51)

JACK, R. W.

Rhodesia Agr. Jour., 11 (1914), 3, 399. (30, 847)

JONES, L. R.

Wis. Sta. Circ. Inform. 36. (28, 53)

LUTMAN, B. F.

Vt. Sta. Bul. 159, 225. (26, 53)

McALPINE, D.

Melbourne: Dept. Agr. Victoria, 1912, 111: rev. in *Nature* (London), **92** (1913), 2289, 27. (30, 48)

ORTON, W. A.

U. S. Dept. Agr., Farmers' Bul. 544. (29, 549)

PETHYBRIDGE, G. H.

Dept. Agr. and Tech. Instr. Ireland Jour., **12** (1912), 2, 334. (27, 446)

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Dept. Agr. and Tech. Instr. Ireland Jour., **10** (1910), 2, 241; abs. in *Farmers' Gaz.*, **69** (1910), 7, 130. (22, 746)

STEWART, F. C., and FRENCH, G. T.

Abs. in *Phytopath.*, **2** (1912), 1, 45. (27, 151)

and SIRRINE, F. A.

N. Y. (Geneva) Sta. Bul. 307. (20, 948)

STIFT, A.

Centbl. Bakt. (etc.), 2 Abt., **23** (1909), 6-9, 173. (22, 347)

TIDSWELL, F., and JOHNSTON, T. H.

Dept. Agr. N. S. Wales, Farmers' Bul. 31. (23, 47)

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*Agr. Gaz. N. S. Wales*, **20** (1909), 11, 998. (22, 453)

#### Bacterial Rot (*Bacillus*)

OSBORN, T. G. B.

Jour. Dept. Agr. So. Aust., **17** (1913), 1, 19. (30, 48) Remove and burn infected plants, use clean seed, and rotate crops.

#### Blackleg

MORSE, W. J.

Me. Sta. Bul. 174. (23, 248) Use clean seed and treat with corrosive sublimate or formalin before cutting.

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Me. Sta. Doc. 375. (23, 548) Disinfect seed.

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Me. Sta. Bul. 194. (26, 546)

#### Corky Scab (*Spongospora*)

BOYD, D. A.

Glasgow Nat., **3** (1911), 3, 82. (26, 748)

EVANS, I. B. P.

Transvaal Agr. Jour., **8** (1910), 31, 462. (23, 548)

JOHNSON, T.

Econ. Proc. Roy. Dublin Soc., **1** (1908), 12, 453. (20, 450) Disinfect seed with Bordeaux or 2-percent copper-sulfate solution. Cultivate thoroly and treat soil with sulfur.

(ANON.)

Jour. Bd. Agr. (London), **15** (1908), 8, 592. (20, 649) Soak seed before planting for two hours in solution of ½ pint of formalin in 15 gallons of water.



Dry Rot (*Fusarium*)

EVANS, I. B. P.

Transvaal Agr. Jour., 7 (1908), 25, 64. (20, 847)

LONGMAN, S.

Jour. Linn. Soc. (London), Bot., 39 (1909), 270, 120. (22, 149)

LOUNSBURY, C. P.

Agr. Jour. Cape Good Hope, 35 (1909), 1, 42. (21, 643) Destroy all diseased tubers, use only healthy seed, and rotate crops.

MANNS, T. F.

Ohio (Wooster) Sta. Bul. 229. (25, 653) Use only sound tubers for seed, practice five- or six-year crop rotation, and avoid the use of infected barnyard manure as a fertilizer.

MORSE, W. J.

Me. Sta. Doc. 375. (23, 548)

ORTON, W. A.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 110. (28, 848) Select clean seed rotate crops, and use care in storing tubers.

PETHYBRIDGE, G. H., and BOWERS, E. H.

Econ. Proc. Roy. Dublin Soc., 1 (1908), 14, 547. (20, 846) Destroy all suspicious tubers when harvesting; examine stored potatoes from time to time and remove those affected. Take care to prevent wounding when handling the crop.

WILCOX, E. M., LINK, G. K. K., and POOL, V. W.

Nebr. Sta. Research Bul. 1. (29, 47) Before storing potatoes treat with lime sulfur, formalin, or formalin vapor.

Early Blight (*Alternaria*)

MILWARD, J. G.

Wis. Sta. Circ. Inform. 3. (22, 247) Only standard, medium late, and late varieties are benefited by Bordeaux spraying. Spray not less than four times, beginning not later than August 15.

SANDSTEN, E. P., and MILWARD, J. G.

Wis. Sta. Bul. 168. (20, 948) Bordeaux recommended.

STUART, W.

Va. Sta. Bul. 179 (1914). (31, 643)

(ANON.)

Dept. Agr. and Tech Instr. Ireland Jour., 9 (1909), 4, 745. (21, 746)

Late Blight (*Phytophthora*)

ALLEN, W. J.

Agr. Gaz. N. S. Wales, 21 (1910), 7, 571. (24, 47) Bordeaux recommended.

BARCUS, M. F.

N. Y. (Cornell) Sta. Circ. 19. (29, 549) Spray with Bordeaux.

BATSY, F.

Petite Rev. Agr. et Hort., 18 (1912), 421, 135. (27, 748) Bordeaux or copper-sulfate solution recommended.

CUTHBERTSON, W.

Gard. Chron., 3 ser., **49** (1911), 1261, 122. (25, 44)

FINARDI, E.

Avven. Agr., **20** (1912), 7, 290; abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **3** (1912), 10, 2310. (29, 246)

GANDARA, G.

Bol. Soc. Agr. Mexicana, **33** (1909), 20, 394; 21, 412; 22, 425. (21, 747)  
Bordeaux recommended.

HAYWOOD, A. H.

Agr. Gaz. N. S. Wales, **21** (1910), 1, 63. (22, 746) Apply 6-4-40 Bordeaux at the rate of 50 gallons per acre.

JONES, L. R., GIDDINGS, N. J., and LUTMAN, B. F.

U. S. Dept. Agr., Bur. Plant. Indus. Bul. **245**. (27, 544)

LEA, A. M.

Agr. Gaz. Tasmania, **19** (1911), 7, 357. (26, 143) Bordeaux recommended.

MCALPINE, D.

Jour. Dept. Agr. Victoria, **7** (1909), 11, 698. (22, 453) Treat seed tubers to dry heat at 120° F. for four hours. Such treatment destroys fungus and increases germinating power. Spray with Bordeaux.

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Jour. Dept. Agr. Victoria, **8** (1910), 6, 358. (23, 744)

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Dept. Agr. Victoria Bul. **27**; Dept. Agr. So. Aust. Bul. **49**. (24, 46)

MORSE, W. J.

Me. Sta. Doc. **375**. (23, 548)

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Me. Sta. Bul. **169**. (22, 546) Apply 5-5-50 Bordeaux when plants are about eight inches high and every ten days thereafter until frost.

MORTENSEN, M. L.

Tidsskr. Landbr. Planteavl, **17** (1910), 2, 293. (23, 744) Spray with Bordeaux about July 20 and one month later.

OLDERSHAW, A. W.

Dept. Agr. and Tech. Instr. Ireland Jour., **11** (1911), 3, 450. (25, 455)

PETHYBRIDGE, G. H.

Dept. Agr. and Tech. Instr. Ireland Jour., **13** (1913), 3, 445. (29, 549)  
Bordeaux better than Burgundy.

RAVN, F. K.

Tidsskr. Landbr. Planteavl, **17** (1910), 2, 271. (23, 744)

REED, H. S.

Phytopath., **2** (1912), 6, 250. (28, 747)

SEYMOUR, G.

Jour. Dept. Agr. Victoria, **10** (1912), 12, 745. (28, 849)

STEVENS, H. E.

Fla. Sta. Rpt. **1912**, 93. (29, 242)

STUART, W.

Va. Sta. Bul. **179** (1914). (31, 643)

TURNER, D.

Agr. Student's Gaz., n. ser., **15** (1910), 2, 38. (24, 252) Late spring spraying with 14-9-100 Bordeaux recommended.

Leaf Roll

APPEL, O. and KREITZ, W.

Mitt. K. Biol. Anst. Land u. Forstw., 1909, 8, 15. (23, 148)

HEDLUND, T.

Tidsskr. Ländtman, **31** (1910); abs. in Bot. Centbl., **114** (1910), 22, 567. (24, 552) A loose seed bed, sound seed tubers, not too deep planting, and liming of the soil are recommended.

LANG, W.

Württomb. Wchnbl. Landw., 1909, 23, 420; 24, 444. (24, 46) Breed resistant varieties.

ORTON, W. A.

U. S. Dept. Agr. Bul. 64 (1914). (30, 649)

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U. S. Dept. Agr., Bur. Plant Indus. Circ. 109. (28, 848) Select clean seed; rotate and improve culture.

OSTERSPEN

Mitt. Deut. Landw. Gesell., **26** (1911), 18, 222. (25, 455)

REMY, T., and SCHNEIDER, G.

Fühling's Landw. Ztg., **58** (1909), 6, 201. (21, 243)

BOHUTINSKY-KRIZEVCI, G.

Ztschr. Landw. Versuchsw. Österr., **13** (1910), 7, 607. (24, 154) Formalin proved worthless in controlling the disease.

SCHANDER, R.

Fühling's Landw. Ztg., **58** (1909), 8, 273. (22, 346)

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Jahresber. Ver. Angew. Bot., **7** (1909), 235. (24, 46) Use only sound tubers for seed.

SCHLEH

Fühling's Landw. Ztg., **58** (1909), 18, 641. (22, 347)

STEGLICH, B.

Sächs. Landw. Ztschr., **57** (1909), 17, 296. (22, 246)

STÖRMER, K.

Jahresber. Ver. Angew. Bot., **7** (1909), 119. (24, 47)

VAÑHÁ, J.

Monatsh. Landw., **3** (1910), 9, 268. (24, 154) Lohsol, a carbolineum preparation, 20 to 40 cc. to every square meter of soil, was very effective either when mixed with soil or used for disinfecting seed tubers.

VON ZEDTWITZ, W.

Wiener Landw. Ztg., **59** (1909), 83, 818; abs. in Centbl. Bakt. (etc.), 2 Abt., **26** (1910), 4-5, 117. (23, 249)

(ANON.)

Ztschr. Landw. Versuchsw. Österr., **14** (1911); 7, 911. (27, 351) Use only healthy tubers for seed.

*Rhizoctonia*

ERIKSSON, J.

Meddel. Centralanst. Försöksv. Jordbruksområdet, 1912, 67; K. Landtbr. Akad. Handl. och Tidskr., 51 (1912), 7-8, 550. (29, 152) Use clean seed and rotate three to four years.

GLOYER, W. O.

N. Y. (Geneva) Sta. Bul. 370 (1913). (30, 539) Soak seed tubers in solution of corrosive sublimate, 1-2000.

## Scab

BERNHARD, A.

Deut. Landw. Presse, 38 (1911), 15, 168; 16, 179. (25, 245) Sulfur recommended.

HOLMES, E. S.

Jour. Dept. Agr. Victoria, 8 (1910), 9, 570. (24, 247) Soak seed tubers for two hours in a 1-30 solution of formalin before cutting.

SEYMOUR, G.

Jour. Dept. Agr. Victoria, 8 (1910), 6, 360. (23, 744)

STONE, G. E., and CHAPMAN, C. H.

Mass. Sta. Rpt. 1912, pt. 1, 84. (30, 150)

VON WAHL, C.

Ber.-Grossh. Bad. Landw. Vers. Anst. Augustenb., 1910, 58. (26, 342) Soak seed tubers for one and one-half hours before planting, in either 2-percent solution Bordeaux or .05-percent solution corrosive sublimate.

Scab (*Oospora*)

BERNHARD, A.

Deut. Landw. Presse, 37 (1910), 18, 204. (23, 744) The use of sulphur is beneficial, as it disinfects the soil, improves physical conditions, and causes quicker and more intensive action of commercial fertilizers.

HENDERSON, L. F.

Maritime Farmer, 14 (1909), 13, 291. (21, 51) Treat seed tubers with solution of either formalin or corrosive sublimate and plant in virgin soil when possible.

Scab, Powdery (*Spongospora*)

JOHNSON, T.

Sci. Proc. Roy. Dublin Soc., n. ser., 12 (1909), 16, 165. (22, 149) Treat scabby tubers with 2-percent Bordeaux and plant seed whole.

MELHUS, I. E.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 127. (29, 347)

MORSE, W. J.

Me. Sta. Bul. 227 (1914). (31, 243)

Wart (*Synchytrium*)

BOS, J. RITZEMA

Tijdschr. Plantenziekten, 16 (1910), 1-2, 59. (23, 347)

CUTHBERTSON, W.

Gard. Chron., 3 ser., 49 (1911), 1261, 122. (25, 44)

ERIKSSON, J.

Jour. Bd. Agr. (London), **21** (1914), 2, 135. (31, 842) The use of a 1-percent solution of formalin at the rate of one quart per square foot of soil as a disinfectant has been found beneficial.

GÜSSOW, H. T.

Canada Cent. Expt. Farm Bul. 63. (22, 545) Clean infected land of tubers and rubbish and apply 4 to 5 tons of unslaked lime per acre.

JOHNSON, T.

Sci. Proc. Roy. Dublin Soc., n. ser., **12** (1909), 14, 131. (22, 149)

JÖSTUNG, H.

Deut. Landw. Presse, **36** (1909), 88, 941. (23, 347) Use only healthy seed, rotate crops, burn diseased tubers, and after cooking, feed slightly infected tubers to stock.

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Deut. Landw. Presse, **36** (1909), 68, 725. (22, 246)

KITLEY, F.

Gard. Chron., 3 ser., **46** (1909), 1175, 362. (23, 744)

MALTHOUSE, G. T.

Field Expts. Harper-Adams Agr. Col. and Staffordshire Joint Rpt. 1908, 19. (24, 449) The use of sulfur at the rate of  $\frac{1}{4}$  pound per square yard of soil is recommended.

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Harper-Adams Agr. Col. Bul., (1910), Nov. (24, 648)

RIEHM, E.

Centbl. Bakt. (etc.), 2 Abt., **24** (1909), 8-12, 208. (22, 650) Gas lime, quicklime, or sulfur applied to soil have been found beneficial.

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, (1909), 18, 294. (25, 245)

SCHNEIDER, G.

Deut. Landw. Presse, **36** (1909), 88, 940. (22, 545) Rotate crops and burn all infected tubers.

SPIECKERMANN

Illus. Landw. Ztg., **34** (1914), 2, 7; 3, 16. (31, 149) Apply sulfur to soil.

ZIMMERMANN, E.

Naturw. Ztschr. Forst u. Landw., **8** (1910), 6, 320. (23, 744)

(ANON.)

Dept. Agr. and Tech. Instr. Ireland Jour., **8** (1908), 3, 441. (20, 649)

(ANON.)

Gard. Chron., 3 ser., **55** (1914), 1416, 106. (31, 149)

(ANON.)

Jour. Bd. Agr. (London), **17** (1910), 7, 556. (24, 347) Use only resistant varieties.

(ANON.)

Dept. Agr. and Tech. Instr. Ireland Jour., **13** (1913), 4, 661. (30, 537)

(ANON.)

Jour. Hort., **60** (1908), 3136, 457. (20, 545)

**POTATO, SWEET**Black Rot (*Sphaeronema*)

HARTER, L. L.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 114. (28, 849)

Dry Rot (*Diaporthe*)

HARTER, L. L., and FIELD, E. C.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 281. (29, 153) Cook diseased potatoes before feeding to stock; sterilize seed beds; use care in selection of seed.

Stem Rot (*Fusarium*)

HARTER, L. L.

U. S. Dept. Agr., Bur. Plant Indus. Circ. 114. (28, 849)

**QUINCE**Fire Blight (*Bacillus*)

PICKETT, B. S.

Ill. Sta. Circ. 172 (1914). (31, 644) Remove and destroy infected trees, which carry disease over winter.

**RASPBERRY**Anthracnose (*Glæosporium*)

LAWRENCE, W. H.

Wash. Sta. Bul. 97. (23, 452) Apply 4-4-50 Bordeaux before leaves appear.

Cane Blight (*Coniothyrium*)

HOWITT, J. E.

Canad. Hort., 36 (1913), 10, 237. (30, 246) Remove and burn all diseased specimens and plant only healthy plants.

O'GARA, P. J.

Off. Path. and Ent. Rogue River Valley, Bul. 4, 1911. (27, 250) Remove and burn all infected canes. Spray in fall before rains with strong Bordeaux. Give three applications of Bordeaux in spring before blossoms appear. If roses are near, give them attention also.

Crown Gall (*Pseudomonas*)

SWINGLE, D. B.

Mont. Sta. Circ. 37 (1914). (31, 644)

*Hendersonia*

(ANON.)

Jour. Bd. Agr. (London), 19 (1912), 2, 124. (27, 448) Cut and burn all diseased canes. Spray with Bordeaux.

Rust (*Gymnoconia*)

WILSON, G. W.

N. C. Sta. Rpt. 1912, 56. (29, 50)

## Yellows

HOWITT, J. E.

Canad. Hort., **36** (1913), 10, 237. (30, 246)

MELCHERS, L. E.

Ohio Nat., **14** (1914), 6, 281. (31, 545) Plant red raspberries secured from uninfected regions, in light or medium heavy soil. Manure well and drain adequately. Remove and burn all diseased plants.

## RICE

## Blight

COLLIER, J. S.

Rpt. of investigations concerning rice. Stuttgart, Ark., 1910. (24, 743)

Ill. Sta. Circ. 156. (27, 47) Good physical condition of soil with aeration at the proper time will prevent the blight.

HEWITT, J. L.

Ark. Sta. Bul. 110. (27, 248) Rotate crops. Plow late in fall and burn stubble.

Smut (*Pleospora*)

RAMIREZ, R.

Bol. Dir. Gen. Agr. (Mexico), Rev. Agr., **2** (1912), 5, 413. (29, 245) Disinfect with formalin.

## ROSE

## Diseases, General

LAUBERT, R., and SCHWARTZ, M.

Rosenkrankheiten und Rosenfeinde Jena, 1910. (24, 748)

Black Spot (*Diplocarpon*)

WOLF, F. A.

Ala. Sta. Bul. 172. (29, 552) Cultivate properly and spray with ammoniacal copper carbonate.

Mildew, Powdery (*Sphaerotheca*)

NORTON, J. B. S., and WHITE, T. H.

Md. Sta. Bul. 156. (26, 450) Apply vaporized sulfur.

SCHMIDT, H.

Österr. Gart. Ztg., **4** (1909), 7, 249; abs. in Centbl. Bakt. (etc.), 2 Abt., **26** (1910), 16-17, 482. (23, 654) Put air-slaked lime around each bush in fall. Dust foliage with sulfur.

Rot (*Botrytis*)

BEAUVERIE, J.

La Pourriture des Roses, Lyon, 1910, 8. Reprint from Les Amis des Roses, 1910. (24, 351) Lime water, lime sulfate, bisulfite of magnesia, nickle sulfate, copper sulfate, or formalin recommended.

**RUBBER**

## Diseases, General

GALLAGHER, W. J.

Dept. Agr. Fed. Malay States Bul. 6. (21, 749)

RIDLEY, H. N.

Agr. Bul. Straits and Fed. Malay States, 8 (1909), 7, 310. (22, 248)

and DERRY, R.

Agr. Bul. Straits and Fed. Malay States, 9 (1910), 8, 289. (24, 158)

Leaf Spot (*Passalora*)

BANCROFT, C. K.

Jour. Bd. Agr. Brit. Guiana, 7 (1913), 1, 37. Spray with lime sulfur; destroy all affected leaves before transplanting.

Pink Disease (*Corticium*)

ANSTEAD, R. D.

Planters' Chron., 6 (1911), 8, 98. (25, 46) Apply 6-4-45 Bordeaux.

(ANON.)

Agr. Bul. Straits and Fed. Malay States, 9 (1910), 2, 59. (23, 152)

Root Disease (*Fomes*)

GALLAGHER, W. J.

Dept. Agr. Fed Malay States Bul. 2. (21, 749)

Agr. Bul. Straits and Fed. Malay States, 7 (1908), 11, 515. (20, 849) Apply lime and destroy fungus by exposure to sunlight.

**RYE**Dry Rot (*Fusarium*)

HILTNER, L.

Prakt. Bl. Pflanzenbau u. Schutz, n. ser., 11 (1913), 8. (30, 242) Corrosive sublimate recommended.

Foot Disease (*Ophiobolus*)

STÖRMER, K., and KLEINE, R.

Illus. Landw. Ztg., 32 (1912), 62, 564. (28, 51) Careful selection of seed and the use of lime, potash, and phosphorous in fertilizers lessens injury from the fungus.

Smut (*Urocystis*)

RAVN, F. K.

Tidsskr. Landbr. Planteavl, 19 (1912), 2, 214. (28, 546) Soak seed in water at 54° C. for five minutes and cool immediately.

**SEA-KALE***Rhizoctonia*

SALMON, E. S.

Gard. Chron., 3 ser., 44 (1908), 1123, 1. (20, 451)



**SNAPDRAGON**Leaf Spot (*Septoria*)

CHITTENDEN, F. J.

Jour. Roy. Hort. Soc. (London), **35** (1909), 2, 216. (22, 455) Spray with Bordeaux or potassium sulfid.

**SORGHUM**Head Smut (*Sorosporium*)

POTTER, A. A.

U. S. Dept. Agr. Jour. Agr. Research, **2** (1914), 5, 339. (31, 747)

**SPINACH**Mildew (*Peronospora*)

SCHNEIDER, N.

Rev. Hort. (Paris), **84** (1912), 21, 493. (28, 446) Distribute sulfur well over plants.

New Disease (*Heterosporium*)

JENNISON, H. M.

Mass. Sta. Rpt. 1910, pt. 1, 146. (26, 55) Select clean seed, prevent injury, and employ first-class cultural methods.

**SPRUCE**Dieback (*Sphaeropsis*)

PETRI, L.

Ann. Mycol., **11** (1913), 3, 278; abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **4** (1913), 10, 1660. (30, 751) Spray with 1-percent Bordeaux.

Leaf Rust (*Chrysomyxa*)

DELFORGE, P.

Bul. Soc. Cent. Forest, Belg., **15** (1908), 9; noted in Rev. Gén. Agron., n. ser., **3** (1908), 10, 424. (20, 849) Provide better air circulation and reduce humidity by thinning out trees. Remove and burn all infection late in season.

**STRAWBERRY**Leaf Spot (*Mycosphaërella*)

SWINGLE, D. B.

Mont. Sta. Circ. 37 (1914). (31, 644)

*Spurmaria*

MANGIN, L.

Rev. Hort. (Paris), **81** (1909), 24, 568. (23, 151) Spray with potassium sulfid, 3-1000.

**SUGAR CANE**

Diseases, General

EDGERTON, C. W.

La. Sta. Bul. 120.

MAUBLANC, C.

Agr. Prat. Pays Chauds, **10** (1910), 88, 43; 89, 143; 90, 232; 91, 312; 92, 379; 93, 502. (25, 847)

Blight (*Mycospharella*)

WILBRINK, G., and LEDEBOER, F.

Meded. Proefstat. Java-Suikerindus., 1910, 39, 443. (24, 648) Reject all diseased canes as seed and plant resistant varieties when possible.

Red Rot (*Colletotrichum*)

BUTLER, E. J., and HAFIZ, A.

Mem. Dept. Agr. India, Bot. Ser., **6** (1913), 5, 151. (30, 649) Secure only sound canes for seed, remove and burn all plants showing infection, and practice long periods of rotation.

EDGERTON, C. W.

La. Sta. Bul. 133. (26, 548)

FAWCETT, H. S.

Fla. Sta. Rpt. 1910, 45. (25, 452) Dip the seed canes in 5-5-50 Bordeaux just before planting. Plant in fall and introduce immune varieties.

KULKARNI, G. S.

Dept. Agr. Bombay Bul. 44 (1911). (27, 48) Use only cuttings showing white pith at ends. Discard cuttings showing slightest reddening.

Root Disease (*Marasmius*)

COBB, N. A.

Hawaiian Sugar Planters' Sta., Div. Path. and Physiol. Bul. 6. (22, 49)

STOCKDALE, F. A.

West Indian Bul. 9 (1908), 2, 103. (21, 147)

**SWEET PEA**

Streak Disease (*Bacillus*)

MANN, T. F., and TAUBENHAUS, J. J.

Gard. Chron., 3 ser., **53** (1913), 1371, 215. (29, 352) Mulch heavily with straw.

Streak Disease (*Macrosporium*)

(ANON.)

Gard. Chron., 3 ser., **51** (1912), 1308, 36; 1309, 52; 1311, 84. (27, 354) Treat seed before planting with solution of potassium permanganate.

Streak Disease (*Thielavia*)

CHITTENDEN, F. J.

Jour. Roy. Hort. Soc. (London), **37** (1912), 3, 541. (27, 45) Secure good active growth, as fungus attacks only weakened plants.

MASSE, G.

Roy. Bot. Gard. Kew, Bul. Misc. Inform., 1912, 1, 44. (26, 551) Fumigate seed bed with formalin or steam. The use of coal ashes or volcanic scoria for seed beds may be advantageous.

## TEA

Blister Blight (*Exobasidium*)

TUNSTALL, A. C.

Indian Tea Assoc., Sci. Dept. Quart. Jour., 1913, 2, 50. (31, 56) Spray dormant bushes with solution of 2 pounds of sodium hydrate to 10 gallons of water. To green bushes apply solution of 6 pounds of copper sulfate and quicklime to 100 gallons of water.

Copper Blight (*Læstadia*)

SHAW, F. J. F.

Agr. Jour. India, 6 (1911), 1, 78. (25, 46) Remove and burn all infection. Apply Bordeaux.

## TIMOTHY

Rust (*Puccinia*)

JOHNSON, E. C.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 224. (26, 52)

Abs. in Science, n. ser., 31 (1910), 803, 791. (23, 450)

PAMMEL, L. H., and KING, C. M.

Ia. Sta. Bul. 131. (27, 445)

## TOBACCO

## Diseases. General

JOHNSON, J.

Wis. Sta. Bul. 237 (1914). (31, 448)

Damping-off (*Pythium*)

RUSSELL, H. L.

Wis. Sta. Bul. 218. (27, 45) Sterilization of seed bed by steam recommended.

## Gummosis

HONING, J. A.

Meded. Deli-Proefstat. Medan, 5 (1910), 1, 24. (24, 248)

Meded. Deli-Proefstat. Medan, 5 (1911), 6, 169. (25, 654)

Mildew, Downy (*Phytophthora*)

JENSEN, H.

Jaarb. Dept. Landb. Nederland. Indië, 1909, 192. (25, 145) The use of carbon bisulfid or potassium permanganate recommended.

## Mosaic

PERREAU

Bul. Soc. Bot. France, 56 (1909), 1, 53. (23, 649) Use only seed from healthy plants.

*Phelipæa*

CONSTANCIS

Jour. Agr. Prat., n. ser., **18** (1909), 43, 565. (22, 348)Root Rot (*Thielavia*)

GILBERT, W. W.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 158 (22, 49) Sterilize seed beds with steam.

Sooty Mold (*Fumago*)

INGLESE, E.

Bol. Tec. Coltiv. Tabacchi (Scafati), **10** (1911), 2, 81. (25, 455)Wilt (*Bacillus*)

HUTCHINSON, C. M.

Mem. Dept. Agr. India, Bact. Ser., **1** (1913), 2, 67. (30, 50) Conserve the moisture and develop root system; avoid alkaline manures; remove and burn all diseased plants.

SMITH, E. F.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 141. (20, 948)

**TOMATO**

## Diseases, General

EDGERTON, C. W., and MORELAND, C. C.

La. Sta. Bul. 142. (30, 50)

FULTON, H. R.

N. C. Sta. Circ. 19 (1914). (31, 644)

HEWITT, J. L.

Ark. Sta. Circ. 21 (1914). (31, 644)

WEBB, T. C.

Jour. Agr. (New Zeal.), **7** (1913), 1, 46. (30, 244)Bacteriosis (*Bacterium*)

FINARDI, E.

Avven. Agr., **20** (1912), 7, 290; abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **3** (1912), 10, 2310. (29, 246)Black Spot (*Alternaria*)

ROLFS, P. H.

Fla. Sta. Bul. 117. (29, 847)

Blight, Bacterial (*Bacillus*)

ROLFS, P. H.

Fla. Sta. Bul. 117. (29, 847)

Blight, Fungous (*Fusarium*)

ROLFS, P. H.

Fla. Sta. Bul. 117. (29, 847)

Blight, Sclerotium (*Sclerotinia*)

ROLFS, P. H.

Fla. Sta. Bul. 117. (29, 847)

## Blossom-end Rot

BROOKS, C.

Abs. in *Phytopath.*, **4** (1914), 1, 49. (31, 447) Disease worse on heavy than on light soil. Application of sodium nitrate beneficial. Lime a partial preventative.

STONE, G. E.

Mass. Sta. Bul. 138. (26, 649) Subirrigate and shade plants.

STUCKEY, H. P., and TEMPLE, J. C.

Ga. Sta. Bul. 96. (26, 648) To control the disease, keep an abundance of water in the soil.

(ANON.)

*Agr. News.* (Barbados), **13** (1914), 315, 174. (31, 644) Give attention to water supply and prevent excessive transpiration.

Canker (*Mycosphaerella*)

(ANON.)

*Gard. Chron.*, 3 ser., **54** (1913), 1393, 167. (30, 148) Proper temperature and humidity in the houses and spraying with Bordeaux should tend to prevent occurrence of disease.

Leaf Mold (*Cladosporium*)

(ANON.)

*Jour. Bd. Agr.* (London), **18** (1912), 11, 920; abs. in *Mycol. Centbl.*, **1** (1912), 6, 181. (27, 651) If plants are young, cover entire surface with half-strength Bordeaux. If flowers and young fruit are present, use potassium-sulfid solution (1 ounce in 4 gallons of water).

(ANON.)

*Agr. News* (Barbados), **13** (1914), 315, 174. (31, 644) Spray frequently with 4-4-50 Bordeaux.

(ANON.)

*Bd. Agr. and Fisheries* (London) Leaflet 262, 1912. (27, 249)

Leaf Spot (*Septoria*)

LONG, H. C.

*Gard. Chron.*, 3 ser., **54** (1913), 1407, 417. (30, 749) Remedial measures recommended by Güssow in *Exp. Sta. Rec.*, 20, 346, approved.

REED, H. S.

*Va. Sta. Bul.* 192. (25, 548) Three to four applications of 4-5-50 Bordeaux recommended.

VERA, V.

*Prog. Agr. y Pecuario*, **15** (1909), 613, 64. (20, 1139)

Rot (*Macrosporium*)

ROLFS, P. H.

Fla. Sta. Bul. 117. (29, 847)

**TULIP***Sclerotium*

ELENKIN, A. A.

Abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **3** (1912), 4, 1066. (27, 851) Uproot and burn affected bulbs. Disinfect soil with carbolineum.

**TURNIP**Club Root (*Plasmodiophora*)

COLLINGS, W. E.

Jour. Cooper Research Lab., 1909, 1, 15. (21, 747)

MANSON, A.

North of Scotland Col. Agr. Expt. Leaflet 24 (1913), 24. (30, 848)

PARDY, A.

North of Scotland Col. Agr. Expt. Leaflet 25 (1913), 52. (30, 848)

Chlorid of lime and lime water have proved beneficial.

**WALNUT**Bacteriosis (*Pseudomonas*)

SMITH, R. E. and C. O., and RAMSEY, H. G.

Cal. Sta. Bul. 231. (28, 349)

**WHEAT**

## Diseases, General

GÜSSOW, H. T.

Canada Expt. Farms Rpts. 1911, 239, 244. (27, 349)

Take-All (*Ophiobolus*)

MANGIN, L.

Jour. Agr. Prat., n. ser., **24** (1912), 32, 174. (27, 748) Burn straw over field; treat seed with solution of copper and dust with lime; sow late.

PRIDHAM, J. T.

Jour. Dept. Agr. Victoria, **9** (1911), 4, 250. (25, 454)

REUTHER

Deut. Landw. Presse, **40** (1913), 65, 780. (30, 242) Select clean seed; use nitrogenous manures sparingly; suppress weeds; rotate; and drain properly.

RICHARDSON, A. E. V.

Jour. Dept. Agr., South Aust., **14** (1910), 5, 466. (24, 551)

STÖRMER, K., and KLEINE, R.

Illus. Landw. Ztg., **32** (1912), 62, 564. (28, 51) Careful selection of seed and the use of lime, potash, and phosphorous in fertilizers lessens injury.

(ANON.)

Bd. Agr. and Fisheries (London) Leaflet 273 (1913). (30, 148) Superphosphate of lime 1½ hundredweight per acre applied while crop is young is effective. Iron sulfate 1 hundredweight per acre checked disease in Australia.

(ANON.)

Agr. Gaz. N. S. Wales, **23** (1912), 11, 934. (28, 646) Grow oats and fallow between crops.

Rust (*Puccinia*)

BIFFEN, R. H.

Jour. Bd. Agr. (London), **15** (1908), 4, 241. (20, 648)

FUSCHINI, G.

Rivista (Conegliano), 4 ser., **17** (1911), 19, 443; abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, **2** (1911), 11-12, 2600. (27, 47) Iron sulfate in soil increases plant vigor and may aid in resisting rust.

McALPINE, D.

Jour. Dept. Agr. Victoria, **7** (1909), 4, 255. (21, 641)

TONNELIER, A. C.

Trab. 4. Cong. Cient. Santiago de Chile, **16** (1908-09), 136. (28, 242) Apply repeatedly fungicides having copper as a basis.

VERNET, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **30** (1909), 40, 428. (22, 49)

Smut, Flag (*Urocystis*)

DARNELL-SMITH, G. P.

Agr. Gaz. N. S. Wales, **25** (1914), 4, 285. (31, 746) Before planting dip seed in 2-percent copper-sulfate solution for five minutes, then in lime water for five minutes.

SCHMITZ, N.

Md. Sta. Bul. 147. (24, 47)

Smut, Loose (*Ustilago*)

APPEL, O., and RIEHM, E.

Arb. K. Biol. Anst. Land u. Forstw., **8** (1911), 3, 343. (26, 546)

LONG, W.

Centbl. Bakt. (etc.), 2 Abt., **25** (1909), 1-4, 86. (22, 745)

Smut, Stinking (*Tilletia*)

DARNELL-SMITH, G. P.

Agr. Gaz. N. S. Wales, **21** (1910), 9, 751. (24, 347)

HEALD, F. D.

Insect Pest and Plant Disease Bur. Nebr. Bul. 2. (21, 642) Formalin recommended.

HECKE, L.

Ztschr. Landw. Versuchsw. Österr., **12** (1909), 2, 49. (23, 46)

HUMPHREY, H. B.

Wash. Sta. Popular Bul. 48. (28, 745) Before planting seed, treat with solution of copper sulfate or formalin.

JORDI, E.

Jahresber. Landw. Schule Rütli, 1908-09, 89; abs. in Centbl. Bakt. (etc.), 2 Abt., **26** (1910), 16-17, 498. (23, 546) Several immersions of seed in Bordeaux before planting recommended.

MCALPINE, D.

Jour. Dept. Agr. Victoria, **8** (1910), 1, 53. (23, 47) Copper solution, 10-50, and formalin solution, 1-40, recommended.

MÜLLER, H. C., and MORGANTHALER, O.

Fühling's Landw. Ztg., **62** (1913), 14, 481, (30, 351). Soak seed in water at 55° C. for ten minutes before planting; plant deeply.

ORTON, C. R.

Proc. Ind. Acad. Sci., 1911, 343. (29, 750) Treat seed before planting with .1-percent solution of formalin.

REYNOLDS, M. H.

Agr. Gaz. N. S. Wales, **24** (1913), 6, 461. (29, 750)

RICHARDSON, A. E. V.

Jour. Dept. Agr. So. Aust., **13** (1910), 6, 491. (23, 47)

ROBERTS, H. F., and GRAFF, P. W.

Kans. Sta. Circ. 12. (24, 153) Jensen modified hot-water treatment recommended.

SOUTTER, R.

Queensland Agr. Jour., **28** (1912), 1, 1. (26, 746)

STÖRMER, K.

Deut. Landw. Presse, **38** (1911), 80, 917; 81, 929. (26, 447)

SUTTON, G. L., and DOWNING, R. G.

Agr. Gaz. N. S. Wales, **21** (1910), 5, 382; abs. in Jour. Dept. Agr. So. Aust., **13** (1910), 11, 960; Gard. Chron., 3 ser., **48** (1910), 1128, 22. (23, 742) Treat seed before planting with a solution of copper sulfate and salt.

(ANON.)

Landw. Ztschr. Rheinprovinz, **10** (1909), 40, 585. (23, 349)

(ANON.)

Agr. Gaz. N. S. Wales, **23** (1912), 5, 396. (27, 649)

## WILLOW

### *Armillaria*

BROOKS, F. T.

Gard. Chron., 3 ser., **49** (1911), 1260, 100. (24, 748) Replace diseased willows with ash, as ash are immune.

## MISCELLANEOUS

### CITRUS FRUITS

#### Diseases, General

ROLFS, P. H., FAWCETT, H. S., and FLOYD, B. F.

Fla. Sta. Bul. 108. (26, 549)

ROSS, C.

Queensland Agr. Jour., n. ser., **1** (1914), 1, 48. (31, 244)



## Blight

FAWCETT, H. S.

Proc. Fla. State Hort. Soc., **22** (1909), 75. (22, 350)

## Canker

STEVENS, H. E.

Fla. Sta. Bul. 122 (1914). (31, 54) Careful inspection of nursery stock, destruction by burning of small infected trees, and pruning off and burning of all diseased parts of larger trees recommended.

## Foot Rot

FAWCETT, H. S.

Proc. Fla. State Hort. Soc., **22** (1909), 75. (22, 350)

## Gummosis

FAWCETT, H. S.

Proc. Fla. State Hort. Soc., **22** (1909), 75. (22, 350)

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Phytopath., **4** (1914), 1, 54. (31, 449) Avoid conditions favorable for infection; make all new plantings with trees budded high on sour stocks; and trim out and paint trunks with concentrated Bordeaux.

FLOYD, B. F.

Fla. Sta. Rpt. 1913, 27. (31, 749)

Knot (*Sphaeropsis*)

HEDGES, F., and TENNY, L. S.

U. S. Dept. Agr., Bur. Plant. Indus. Bul. 247. (27, 652) Remove and burn all diseased limbs.

Scab (*Cladosporium*)

FAWCETT, H. S.

Fla. Sta. Bul. 109. (27, 653) Ammoniacal copper carbonate recommended.

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Proc. Fla. State Hort. Soc., **22** (1909), 75. (22, 350)

Scaly Bark (*Colletotrichum*)

ESSIG, E. O.

Pomona Col. Jour. Econ. Bot., **1** (1911), 1, 25. (24, 747) Bordeaux 4-4-50 recommended.

FAWCETT, H. S.

Proc. Fla. State Hort. Soc., **22** (1909), 75. (22, 350)

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Fla. Sta. Rpt. 1909, 44. (23, 446)

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Fla. Sta. Rpt. 1910, 45. (25, 450) Scrape off diseased bark, paint surface with carbolineum mixture consisting of 1 gallon of carbolineum and 1 gallon of water in which 1 pound of whale oil soap has been dissolved.

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Fla. Sta. Bul. 98. (20, 1045) Bordeaux recommended.

FAWCETT, H. S.

Fla. Sta. Bul. 106. (25, 551) Bordeaux recommended.

ROLFS, P. H.

Pomona Col. Jour. Econ. Bot., 1 (1911), 3, 107. (27, 50)

Stem-end Rot (*Phomopsis*)

FAWCETT, H. S.

Fla. Sta. Bul. 107. (26, 449) Destroy infected branches and fruit and spray against scale insects. Cull fruit to be shipped and keep cool in transit.

STEVENS, H. E.

Fla. Sta. Rpt. 1913, 72. (31, 750) Bordeaux recommended.

Fla. Sta. Bul. 111. (28, 651) Prune out dead branches, spray with Bordeaux or ammoniacal copper carbonate, and destroy all infected fruit.

### FIELD CROPS

#### Diseases, General

JACKSON, H. S.

Del. Sta. Bul. 83. (20, 946)

WHETZEL, H. H.

N. Y. (Cornell) Sta. Bul. 283. (24, 550)

### CEREALS

#### Diseases, General

BOLLEY, H. L.

N. D. Sta. Bul. 87. (22, 744)

FOEX, E.

Rev. Phytopath. Appl., 1 (1914), 18-19, 13; 20-21, 17; 22-23, 25. (31, 841)

HOFFMANN, M.

Jahresber. Landw., 24 (1909), 203. (24, 345)

HOWITT, J. E.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, 37 (1911), 47. (27, 746)

KIRCHNER, O.

Württemb. Wchnbl. Landw., 1913, 29, Beilage, 439; 30, Beilage, 445. (29, 845)

MÜLLER, H. C., MOLZ E., and MORGENTHALER, D.

Ber. Agr. Chem. Kontroll u. Vers. Stat. Pflanzenkrank. Prov. Sachsen, 1912, 67. (30, 148)

MÜLLER, H. C., STÖRMER, K., et. al.

Ber. Agr. Chem. Kontroll u. Vers. Stat. Pflanzenkrank. Prov. Sachsen, 1910, 71. (26, 142)

STÖRMER, K.

Landw. Wchnschr. Sachsen, 12 (1910), 2, 10; 3, 19; 4, 27. (22, 741)

#### Anthracnose (*Colletotrichum*)

SELBY, A. D., and MANNS, T. F.

Ohio (Wooster) Sta. Bul. 203. (21, 745)

Foot Disease (*Ophiobolus*)

GUERRAPAIN, A., and DEMOLON, A.

Betterave, **23** (1913), 597, 386; 598, 402; **24** (1914), 599, 7. (30, 747)

## Mildew

REED, G. M.

Bul. Torrey Bot. Club, **36** (1909), 7, 353. (21, 641)

Rust (*Puccinia*)

FREEMAN, E. M., and JOHNSON, E. C.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 216. (25, 651) Breed resistant varieties.

JORDI, E.

Jahresber. Landw. Schule Rütli, 1909-10, 108. (24, 345)

LAMONT, W. J.

Agr. Jour. Cape Good Hope, **37** (1910), 3, 243. (24, 346)

McALPINE, D.

Jour. Dept. Agr. Victoria, **8** (1910), 5, 284. (23, 649)

## Smut

APPEL, O.

Mitt. Deut. Landw. Gesell., **24** (1909), 16, 256. (21, 549)

Jahrb. Deut. Landw. Gesell., **24** (1909), 2, 319. (21, 642)

and RIEHM, E.

Mitt. K. Biol. Anst. Land u. Forstw., 1910, 10, 7. (23, 646) Soak seed for five hours in water at 25° C. Then dry for 25 minutes at 60° C.

BROZ, O.

Monatsh. Landw., **4** (1911), 10, 289; **5** (1912), 1, 17. (27, 246) Sterilize seed with formalin or copper sulfate.

BURMESTER, H.

Ztschr. Pflanzenkrank., **18** (1908), 3, 154. (21, 242)

D'IPOLLITO, G.

Bol. Quind. Soc. Agr. Ital., **16** (1911), 19, 680; abs. in Riv. Patol. Veg., **5** (1911), 9, 133. (27, 149) Hot-water treatment of seed recommended.

ERIKSSON, J.

K. Landtbr. Akad. Handl. och Tidskr., **47** (1908), 4, 274. (22, 246)

FALCK, R.

Jour. Landw., **56** (1908), 2, 173. (20, 648)

FREEMAN, E. M., and STACKMAN, E. C.

Minn. Sta. Bul. 122. (25, 144) Sterilize seed with formalin, copper sulfate, or hot water.

GÜSSOW, H. T.

Canada Central Expt. Farm Bul. 73. (30, 47)

HUGHES, H. D., and TAFT, P. C.

Ia. Sta. Circ. 11 (1913). (31, 344)

JOHNSON, E. C.

U. S. Dept. Agr., Farmers' Bul. 507. (28, 51)

JORDI, E.

Jahresber. Landw. Schule Rütli, 1909-10, 108. (24, 345) Breed resistant varieties.

KIRCHNER, O.

Illus. Landw. Ztg., **29** (1909), 30, 305. (21, 446)

LANG, H.

Illus. Landw. Ztg., **28** (1908), 70, 603. (20, 947) Soak seed from 6 to 12 hours in water at ordinary temperature. Then subject to air heated to 60° C.

McALPINE, D.

Jour. Dept. Agr. Victoria, **8** (1910), 5, 284. (23, 649)

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Melbourne Dept. Agr. Victoria, 1910, 288. (24, 45)

MURRAY, J.

Canada Expt. Farms Rpts. 1909, 275. (22, 345)

PYE, H.

Jour. Dept. Agr. Victoria, **7** (1909), 6, 368. (21, 641)

REED, G. M.

Ann. Rpt. Mo. Bd. Agr., **44** (1911), 253. (28, 51)

RIEHM, E.

Deut. Landw. Presse, **36** (1909), 35, 373. (21, 446)

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Deut. Landw. Presse, **40** (1913), 10, 107. (29, 47)

STEVENS, F. L.

N. C. Sta. Bul. 212. (24, 246)

STEWART, R., and STEPHENS, J.

Utah Sta. Bul. 108. (23, 742)

STÖRMER, K., et al.

Deut. Landw. Presse, **38** (1911), 88, 1005. (27, 246) Modified hot-water treatment recommended.

WILCOX, E. M.

Nebr. Sta. Bul. 131. (28, 445)

ZAVITZ, C. A.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, **34** (1908), 183. (21, 341) Immerse seed in formalin solution (1 pint of formalin to 42 gallons of water) for 20 minutes.

Smut, Loose (*Ustilago*)

APPEL, O.

Ber. Deut. Bot. Gesell., **27** (1909), 10, 606. (23, 46) Hot-water treatment of seeds recommended.

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Illus. Landw. Ztg., **30** (1910), 15, 126. (23, 148)

\_\_\_\_\_ and RIEHM, E.

Mitt. K. Biol. Anst. Land u. Forstw., 1909, 8, 9. (23, 247)

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Min. Bl. K. Preuss. Verwalt. Landw., Domänen u. Forsten, **7** (1911), 5, 118. (25, 453) Apparatus for hot-air and hot-water treatments described.

ARTHUR, J. C., and JOHNSON, A. C.

Ind. Sta. Circ. 22. (23, 147) Formalin recommended.

COOK, M. T.

N. J. Sta. Circ. 36. (31, 446)

DETKEN, W.

Illus. Landw. Ztg., 29 (1909), 83, 783. (22, 345) Soak seed in cold water for several hours; then dry at 60° C.

FREEMAN, E. M., and JOHNSON, E. C.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 152. (21, 445)

LOCHHEAD, W.

Ann. Rpt. Quebec Soc. Protec. Plants (etc.), 3 (1910-11), 67. (26, 341)

SCHANDER, R.

Landw. Centbl. Posen, 1910, 5; abs. in Centbl. Bakt. (etc.), 2 Abt., 28 (1910), 9-11, 302. (24, 346)

Deut. Landw. Presse, 37 (1910), 30, 333. (24, 346) Hot-water method of treatment described in full.

Mitt. Kaiser Wilhelms Inst. Landw. Bromberg, 6 (1914), 2, 132. (31, 147)

STÖRMER, K.

Landw. Wchnschr. Sachsen, 10 (1908), 35, 306; 38, 331; 39, 340; 40, 347. (20, 1042)

Landw. Wchnschr. Sachsen, 12 (1910), 12, 91. (23, 346)

Smut, Stinking (*Tilletia*)

APPEL, O.

Mitt. Deut. Landw. Gesell., 28 (1913), 16, 1. (30, 449)

COOK, M. T.

N. J. Sta. Circ. 36. (31, 446)

DITZELL, F., and DOWNING, R. G.

Agr. Gaz. N. S. Wales, 22 (1911), 4, 341. (25, 750) Copper sulfate, copper sulfate and lime-water, copper sulfate and sodium chlorid, Fungusine, and Bordeaux paste all recommended.

LOCHHEAD, W.

Ann. Rpt. Quebec Soc. Protec. Plants (etc.), 3 (1910-11), 67. (26, 341)

ORTON, C. R.

Proc. Ind. Acad. Sci., 1911, 343. (29, 750)

STEWART, R., and STEPHENS, J.

Utah Sta. Bul. 108. (23, 742)

#### Straw Blight

FRON, G.

Abs. in Internat. Inst. Agr. (Rome), Bul. Bur. Agr. Intel. and Plant Diseases, 3 (1912), 4, 1054. (27, 747)

(ANON.)

Ann. Uffic. Agr. Prov. Bologna, 18 (1911-12), 194. (30, 349)

**TREES, GENERAL**

## Diseases, General

FORBES, A. C.

Dept. Agr. and Tech. Instr. Ireland Jour., **10** (1909), 1, 35. (22, 549)

KÖCK, G.

Sep. from Landes Amtsbl. Erzherzogt. Österr. unter der Enns, 1909, 4-5, 36 (23, 553)

MASSEE, G.

Diseases of Cultivated Plants and Trees. New York and London, 1910. (24, 44)

MER, E.

Bul. Soc. Nat. Agr. France, **70** (1910), 7, 652. (24, 251)

VON SCHRENK, H., and SPAULDING, P.

U. S. Dept. Agr., Bur. Plant Indus. Bul. 149. (21, 448)

Root Rot (*Agaricus*)

ADESPEISSIS, A.

Jour. Dept. Agr. West Aust., **17** (1908), 1, 534. (20, 1141)**TREES, CONIFEROUS**Damping-off (*Pythium*)

HARTLEY, C. P.

Science, n. ser., **36** (1912), 933, 683. (28, 246)Gray Mold (*Botrytis*)

(ANON.)

Bd. Agr. and Fisheries (London) Leaflet 234. (23, 653) Burn all diseased seedlings and spray with a solution of 11 pounds copper sulfate, 16 pounds copper carbonate, 1 pound potassium permanganate, and 3 pounds soft soap in 100 gallons of rain water.

*Phoma*

MER, E.

Bul. Soc. Sci. Nancy, 3 ser., **9** (1908), 2, 104. (20, 849)**TREES, FRUIT**

## Diseases, General

BETHUNE, C. J. S.

Ann. Rpt. Ontario Agr. Col. and Expt. Farm, **35** (1909), 34. (23, 351)

COLLINGS, W. E.

Rpt. Econ. Biol., **2** (1912), 41. (26, 445)

GÜSSOW, H. T.

Canada Exp. Farms Rpts. 1911, 239. (27, 349)

HEALD, F. D.

Texas Dept. Agr. Bul. **22** (1911). (30, 537)

KIRCHNER, O.

Württemb. Wchnbl. Landw., 1913, 29, 439; 30, 455. (29, 845)

LEWIS, A. C.

Ga. Bd. Ent. Bul. 32 (1910), 35. (24, 745)

LINSBAUER, L., ZWEIGELT, F., and ZUDERWELL, H.

Programm u. Jahresber. K. K. Höh. Lehranst. Wein u. Obstbau Klosterneuburg, 1912-13, 159. (30, 240)

LOYD, F. E., RIDGWAY, C. S., and CHATTERTON, H. J.

Bul. Agr. Dept. (Ala.), 32. (23, 247)

MORSE, W. J.

Me. Sta. Bul. 164. (21, 144)

MÜLLER, H. C., MOLZ, E., and MORGENTHALER, D.

Ber. Agr. Chem. Krontoll u. Vers. Stat. Pflanzenkrank. Prov. Sachsen, 1912, 67. (30, 148)

NORTON, J. B. S., and NORMAN, A. J.

Md. Sta. Bul. 143. (23, 252)

PAMMEL, L. H.

Trans. Iowa Hort. Soc., 47 (1912), 196. (29, 445)

REED, G. M.

Ann. Rpt. Mo. Bd. Hort., 5 (1912), 342. (28, 243)

SALMON, E. S.

Jour. Southeast Agr. Col. Wye, 1912, 21, 321. (30, 348)

SELBY, A. D.

Ohio State Hort. Soc. Ann. Rpt., 43 (1910), 77. (24, 447)

TOMPSON, H. C.

Miss. Sta. Bul. 141. (24, 45)

WESTERDYJK, JOHANNA

Phytopath. Lab. "Willie Commelin Scholten," Jaarver, 1912. (30, 647)

WHETZEL, H. H.

N. Y. (Cornell) Sta. Bul. 283. (24, 550)

Black-Spot Canker

CARPENTER, J. F.

Brit. Columbia Dept. Agr. Bul. 34 (1911). (27, 448) To prevent infection, apply Bordeaux or lime sulfur. Keep dry and free from injury.

Brown Rot (*Monilia*)

DE ISTVÁNFFI, G.

Bul. Inst. Cent. Ampélol. Roy. Hongrois, 1 (1906), 29. (21, 552)

Chlorosis

RIVIÈRE, G., and BAILHACHE, G.

Jour. Soc. Nat. Hort. France, 4 ser., 14 (1913), 287. (30, 749) Iron sulfate gives favorable results, due probably to the metallic component of this salt.

(ANON.)

Bol. Quind. Soc. Agr. Ital., 16 (1911), 16, 595; abs. in Mitt. Deut. Landw. Gesell., 26 (1911), 42, 582. (26, 749)

Crown Gall (*Pseudomonas*)

PHILLIPS, J. L.

Rpt. State Ent. and Plant Path. Va., 7 (1908-09), 56. (23, 149)

Fire Blight (*Bacillus*)

JONES, D. H.

Ontario Dept. Agr. Bul. 176. (23, 49)

STEWART, V. B.

N. Y. (Cornell) Sta. Bul. 329. (29, 348) Eradicate holdover blight, remove quince blossom buds, and inspect diseased areas often.

N. Y. (Cornell) Sta. Circ. 20. (29, 551)

WHETZEL, H. H., and STEWART, V. B.

N. Y. (Cornell) Sta. Bul. 272. (22, 747)

Hypochnose (*Hypochnus*)

STEVENS, F. L., and HALL, J. G.

Ann. Mycol., 7 (1909), 1, 49. (21, 244)

Mushroom Root Rot (*Armillaria*)

BARSS, H. P.

Ore. Countryman, 6 (1913), 3, 113. (30, 649) Remove and destroy affected and dead roots; disinfect with Bordeaux, lime sulfur, or corrosive sublimate and treat exposed surfaces with tree paint or grafting wax.

Scab (*Venturia*)

HUBER, K.

Deut. Obstbau Ztg., 1908, 23-24, 382. (21, 54) Bordeaux recommended.

## TRUCK CROPS

## Diseases, General

COLLINGS, W. E.

Rpt. Econ. Biol., 2 (1912), 41. (26, 445)

EASTHAM, J. W., and HOWITT, J. E.

Ontario Dept. Agr. Bul. 171. (21, 342)

FAWCETT, H. S.

Fla. Sta. Rpt. 1908, 64. (21, 343)

GIDDINGS, N. J.

W. Va. Sta. Bul. 123. (23, 46)

HARTER, L. L.

Va. Truck Sta. Bul. 1. (22, 147)

KIRCHNER, O.

Württemb. Wchnbl. Landw., 1913, 29, 439; 30, 455. (29, 845)

MÜLLER, H. C., STÖRMER, K., et al.

Ber. Agr. Chem. Kontroll u. Vers. Stat. Pflanzenkrank. Prov. Sachsen, 1910, 71. (26, 142)

MÜLLER, H. C., MOLZ, E., and MORGENTHALER, D.

Ber. Agr. Chem. Kontroll u. Vers. Stat. Pflanzenkrank. Prov. Sachsen, 1912, 67. (30, 148)

SACKETT, W. G.

Colo. Sta. Bul. 138. (21, 145)



- SELBY, A. D.  
Ann. Rpt. Columbus Hort. Soc., 1910, 13. (28, 148)
- TOMPSON, H. C.  
Miss. Sta. Bul. 141. (24, 45)
- WESTERDIJK, JOHANNA  
Phytopath. Lab. "Willie Commelin Scholten," Jaarver, 1911. (30, 647)
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- Phytopath. Lab. "Willie Commelin Scholten," Jaarver, 1912. (30, 647)
- WHETZEL, H. H.  
N. Y. (Cornell) Sta. Bul. 283. (24, 550)
- (ANON.)  
Wis. Sta. Bul. 228. (28, 844)
- Club Root (*Plasmodiophora*)
- VAN POETEREN, N.  
Tijdschr. Plantenziekten, 17 (1911), 4-6, 150. (26, 447)
- WAGNER, J. P.  
Mitt. Deut. Landw. Gesell., 24 (1909), 41, 610. (23, 250)
- Damping-off (*Fusarium*)
- GIFFORD, C. M.  
Vt. Sta. Bul. 157. (26, 57)

FUNGICIDES  
ADHERENTS, GENERAL

ASTRUC, H.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 24, 746; 25, 780. (29, 554)

FONZES-DIACON, H.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 11, 331. (29, 157)

LECOMTE, A.

Rev. Vit., **40** (1913), 1027, 225. (30, 248)

VERMOREL, V., and DANTONY, E.

Compt. Rend. Acad. Sci. (Paris), **154** (1912), 20, 1300-1302. (27, 548)

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Compt. Rend. Acad. Sci. (Paris), **156** (1913), 19, 1475; Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 21, 657. (29, 451)

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Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 25, 778. (30, 153)

WEINMANN, J.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **33** (1912), 23, 709. (27, 753)

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Prog. Agr. et Vit. (Ed. l'Est-Centre), **33** (1912), 29, 85. (28, 154)

PREPARATION AND APPLICATION, GENERAL

CHANDLER, W. H.

Ann. Rpt. Mo. Bd. Hort., **2** (1908), 314. (22, 152)

CHAPPAZ, G.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 16, 487. (29, 554)

COOK, M. T.

The Diseases of Tropical Plants, 1913, 11. (31, 241)

HOLLRUNG, M.

Die Mittel zur Bekämpfung der Pflanzenkrankheiten, Berlin, 1914, 2 ed., rev. and enl., 8. (31, 745)

MCCALLUM, W. B.

Ariz. Sta. Bul. 60. (22, 53)

MCCUE, C. A.

Del. Sta. Bul. 98. (28, 449)

VAN HALL-DE JONGE, A. E.

Dept. Landb. Suriname Bul. 22. (22, 549)

VERMOREL, V., and DANTONY, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 24, 745. (30, 153)

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Notes sur les Preparations Insecticides, Fongicides et Bouillies Mouillantes, Montpellier and Villefranche, 1914. (31, 153)

VIVARELLI, L.

Rivista (Conegliano), 4 ser., **16** (1910), 11, 249; 12, 277; 13, 296. (23, 747)

WHETZEL, H. H.

N. Y. (Cornell) Sta. Circ. 2. (20, 551)

(ANON.)

Insect Pest and Plant Disease Bur. Nebr. Bul. 1. (21, 645)

**BORDEAUX****Preparation and Application—**

MCALPINE, D.

Jour. Dept. Agr. Victoria, **8** (1910), 2, 728. (24, 555)

O'GARA, P. J.

Rogue River Fruit Grower, **1** (1909), 7, 1. (22, 249)

QUANJER, H. M.

Tijdschr. Plantenziekten, **16** (1910), 1-2, 16. (23, 355)

SALMON, E. S.

Jour. Bd. Agr. (London), **16** (1910), 10, 793. (22, 653)

VAN DER ZANDE, K. H. M., and LAGERS, G. H. G.

Tijdschr. Plantenziekten, **16** (1910), 1-2, 32. (23, 356)

VERMOREL, V., and DANTONY, E.

Prog. Agr. et Vit. (Ed. l'Est-Centre), **34** (1913), 24, 745. (30, 153)**Chemistry—**

BARKER, B. T. P., and GIMINGHAM, C. T.

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A Bibliography of  
Non-Parasitic Diseases  
of Plants

BY

CYRUS W. LANTZ



## PREFACE

The aim in the preparation of this bibliography is merely to present a list of non-parasitic diseases of plants with reference to the more important literature on these diseases. The list includes those diseases in which no parasites have been found and some diseases—e. g., gummosis—in which there is some question as to whether the cause is or is not a parasite.

The diseases are listed under the common names of the plants upon which they occur, and the names of these plants are arranged alphabetically. Where a disease occurs upon several different plants,—e. g., chlorosis, mosaic,—it is also given a separate heading, and placed in its alphabetical position. Plant injuries are also arranged in this way.

Owing to the confusion in the naming of some of the so-called physiological diseases and to the lack of definite knowledge concerning them, it is probable that the same disease in some instances occurs under two different names; however, it seems better to err in this way than to risk the grouping together of distinct diseases as one. The names here used for the diseases are those found in the original publication.

This list of diseases and literature is complete up to and including the year 1914 in so far as it has been possible to make it. Free use has been made of a bibliography of non-parasitic diseases of plants published by Dr. George E. Stone in the 17th Annual Report (1905) of the Hatch Experiment Station of Massachusetts and of the reviews in the Experiment Station Record.

# A BIBLIOGRAPHY OF NON-PARASITIC DISEASES OF PLANTS

BY CYRUS W. LANTZ, ASSISTANT IN BOTANY

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**CRANBERRY**

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SHEAR, C. L.

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**CUCUMBER**

## Leaf Curl

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## Mosaic

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MUTH, F.

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Chlorosis

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General

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EVANS, P.  
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BECKWITH, M. H.

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BLAKE, M. A.

N. J. Sta. Bul. **226** (1910).

BUTZ, G. C.

Pa. Sta. Bul. **37** (1896).

CLINTON

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CORBETT, L. C.

W. Va. Sta. Bul. **66** (1900).

ESSIG, E. O.

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HUTCHINS, E.

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JOHNSON, W. G.

Md. Sta. Bul. **42** (1896).

MAYNARD, S. T.

Mass. (Hatch) Sta. Bul. **8** (1890).

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TAFT, L. R.

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ZIMMERMAN, A.

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### Chlorosis

SCHELLENBERG, H.

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### Frost Injury

CRANDALL, C. S.

Colo. Sta. Bul. 41 (1898).

JONES, L. R.

Vt. Sta. Bul. 49 (1895).

SMITH, R. E.

Mo. Weather Rev., 39 (1911), 8, 1257.

STURGIS, W. C.

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**PECAN**

Rosette

- ORTON, W. A., and RAND, F. V.  
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**PEPPER**

Mosaic

- SCHWARZE, C. A.  
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**PLUM**

Frost Cracks and Sun Scald

- CHESTER, F. D.  
 Del. Sta. Bul. 57 (1902).  
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 Cal. Sta. Bul. 41 (1898).

Gummosis

- HEDRICK, U. P.  
 Ore. Sta. Bul. 45 (1897).  
 SELBY, A. D.  
 Ohio Sta. Bul. 79 (1897).

Yellows

- STONE, G. E.  
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 STEWART, F. C.  
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APPEL, O.

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(See Cereal.)

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(See Aster, Oats, Peach, Plum, and Raspberry.)

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(See Cereal.)

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