III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

WILT AND ROOT ROT (Fusarium oxysporum). Several areas in an 8-acre field at Colchester South, Ont. had yellow, stunted plants from which Fusarium was isolated. Yield from the affected areas was very small during the 1958 cutting season (R.W. Walsh).

BEANS

Field Bean Diseases in Western Ontario in 1958

R.N. Wensley

Pythium wilt. The first evidence of this disease was found on the Kinghorn variety of wax beans in Essex County during the first week in July. Approximately 1 per cent mortality occurred among plants in several fields visited. This disease was subsequently found to be widespread in Essex and Kent Counties on the Michelite, Sanilac and Clipper varieties of white beans and on Dark and Light Red Kidney beans. Incidence of disease was variable, ranging from 1 per cent to a high of 70 per cent. However, recovery occurred in the more heavily affected fields subsequent to improved climatic conditions.

Root rot was prevalent on field beans throughout western Ontario. Severity of symptoms varied greatly from mild to severe according to field conditions, soil type, the time of planting, and crop sequence. Under the prevailing unfavorable weather conditions during the early spring period Pythium species remained the dominant causal factor. The most severe reductions in stand were found in fields successively cropped to white beans and in fields where drainage was inadequate.

Anthracnose (Colletotrichum lindemutheanum) was most prevalent in Huron County where the incidence of infection ranged from 5-25 per cent on Clipper to a high of 70 per cent on Michelite and Yellow Eye. No evidence of anthracnose was found on the early maturing white bean variety Sanilac.

Bacterial blight (Xanthomonas phaseoli) was prevalent throughout western Ontario on all varieties of white beans. This disease together with bacterial blight was predominant on Sanilac. However, the greatest intensity of infection was found on the varieties Michelite and Clipper.

Virus was not an important factor in 1958 and was rarely found.

Other Observations

GRAY MOLD (Botrytis cinerea) was tr. in all commercial fields seen in York Co., N.B. (S.R. Colpitts), and was tr. in part of a large planting at Weston, N.S. (K.A. Harrison).

ANTHRACNOSE (Colletotrichum lindemuthianum) was mod. in several home gardens at Lacalle, Que. (R. Crête). It was prevalent on the Soldier variety in York and Carleton counties in N.B. Infection appeared early and spread in wet weather and losses were heavy, ranging up to 60%. Lapin was generally free of infection (S.R.C.). Losses of 100% of the crop were sustained by a market gardener at Brackley, P.E.I. Two fields and several varieties were involved (J.E. Campbell). It was not generally troublesome in N.S. in 1958 though a small planting at Kentville was 100% infected (K.A.H.). Tr. infections were seen on Contender at St. John's West, Nfld. (O.A. Olsen).

ROOT ROT (Fusarium solani f. phaseoli). A small garden planting at Inglisville, N.S. was completely infected with this disease (C.O. Gourley).

HALO BLIGHT (Pseudomonas phaseolicola) caused sev. damage in 1 canning crop field at Coaldale, Alta. and tr.-sl. damage in a field at Fincastle (J.E. Moffatt). It was prevalent in early green beans and dry beans in most areas of N.B. Two early bean plantings were a complete loss (S.R.C.). Halo blight was seen at Waterville and caused a 75% loss at New Canaan, N.S. (K.A.H.).

SCLEROTINIA ROT (S. sclerotiorum) was seen in specimens from Kamloops, B.C. (G.E. Woolliams). A 1% infection was recorded in a field at Ste. Anne de la Pocatiere, Que. (L.J. Coulombe), and one-third of a 2-acre field was destroyed at Morristown, N.S. The rows in this field were close and heavy foliage favored the retention of moisture. Sclerotia and apothecia were scattered thickly over the soil (K.A.H.).

COMMON BLIGHT (Xanthomonas phaseoli). A 10% infection caused sl. damage to Sensation Wax at St. Prime, Que. (L.J.C.). A field, sown with seed from a sl. infection 1957 crop, was 100% affected at Charlottetown, P.E.I. (D.B. Robinson). Several acres of Yellow Eye at Grand Pre, N.S. showed a light general infection (K.A.H.).

COMMON MOSAIC (Bean common mosaic virus) occurred in varying degrees of severity throughout the Okanagan Valley, B.C. (G.E.W.). It was sl. in 2 fields and tr. in another at Fincastle, Alta. (J.E.M.). Mosaic was mod. in a 1-acre field at Ste. Clothilde, Que. (R. Crete). A few N.S. fields planted with local seed showed sev. infections. Canning crop fields were generally free of mosaic (K.A.H.).

FROST INJURY. Temperatures of 28-32°F on 10 June completely destroyed some fields in Kings and Annapolis counties in N.S. Many other fields remained yellow and plants had numerous necrotic lesions. Growth was still greatly retarded on 4 July. A loss of 20% in the overall crop is estimated (K.A.H.).

BEET

SCAB (Streptomyces scabies) was mod-sev. at Ste. Foy, Que. (D. Leblond). Infection was 80% in a garden plot at Salisbury, N.B. (S.R. Colpitts).

BROAD BEAN

WILT (Fusarium oxysporum f. fabae) was mod. at Ste. Foy, Que. (D. Leblond). The Windsor variety was 20% infected in a field at St. Felicien, Que. (L.J. Coulombe).

BORON DEFICIENCY. A condition, thought to be boron deficiency was seen in 50% of the plants in a 5-acre field at Salmon Arm, B.C. (G.E. Woolliams).

POD BLACKENING (non-parasitic) was sev. on Grosse de Windsor at Ste. Foy, Que. (D.L.).

BROCCOLI

CLUB ROOT (Plasmodiophora brassicae) was mod.-sev. in plantings in P.E.I. (G.W. Ayers).

HOLLOW STEM (Boron deficiency) was seen in specimens from a 3-acre field at St. Telesphore, Que. (R. Crête).

BRUSSELS SPROUTS

CLUB ROOT (Plasmodiophora brassicae) was sev. in a planting at St. Peters, P.E.I. Infection occurred in the seed bed (J.E. Campbell).

CABBAGE

YELLOWS (Fusarium oxysporum f. conglutinans). At Sandwich West, Ont. 75% of a 1.5-acre field was affected. In a portion of the field where cabbage was grown the previous year infection was 100% (R.W. Walsh).

BOTTOM ROT (Pellicularia filamentosa) affected 10,000 plants in a field at Falmouth, N.S. Growth was poor and many plants showed a dark rot in the midrib and yellowing of lower leaves. Isolations yielded the organism (K.A.H.).

WIRE STEM (Pellicularia filamentosa) was mod. in seed-beds at Ste. Foy, Que. (D. Leblond).

CLUB ROOT (Plasmodiophora brassicae). A 1-acre field at Sandwich West, Ont. was more than 60% infected. Plants were stunted and wilting and most of the clubs on the roots were more than one-half inch in diameter (R.W.W.). Club root was widespread and sev. in N.B. (J.L. Howatt), and was mod.-sev. in P.E.I. (G.W. Ayers). It is widespread in Kings Co., N.S. and the problem of its control is critical. Growers are finding that a 7-8 year rotation is not sufficient. The prevalence of cruciferous weeds is maintaining the organism (K.A. Harrison). Club root was light to mod. in the St. John's and Conception Bay areas of Nfld. (O.A. Olsen).

SCLEROTINIA ROT (S. sclerotiorum). The variety Danish Ball Head was 20% infected in a planting at Waterville, N.S. (K.A.H.).

DAMPING OFF (various organisms) was recorded at Langham, Sask. (T.C. Vanterpool) and at Gagetown and Oromocto, N.B. (S.R. Colpitts).

BLACK ROT (Xanthomonas campestris). A sl. infection was observed at La Gorgendiere, Que. (D.L.).

CARROT

CROWN GALL (Agrobacterium tumefaciens). Galls appeared on the lower portions of carrots stored in dry sand at Vantage, Sask. (T.C. Vanterpool).

LEAF SPOT (Alternaria dauci). Some lesions producing Alternaria spores were found with more numerous Cercospora lesions in a 10-acre field at Berwick, N.S. The combined effect was serious (K.A. Harrison). Walker, (Diseases of Vegetable Crops. McGraw-Hill, 1952), states that the disease occurs commonly in conjunction with Cercospora blight. The symptoms of the diseases are much alike with the Alternaria more likely to attack the older leaves (D.W. Creelman).

BLACK ROT (Alternaria radicina) was tr. on the market at Quebec City (D.L.) One warehouse lot at Grand Pre, N.S. showed a number of carrots with crown infections (K.A.H.).

CERCOSPORA BLIGHT (C. carotae). A sev. infection in a one-half-acre field near Aylmer, Que. caused mod. damage. Nearly 100% of the plants were affected and some petioles were girdled and yellowing (D.S. MacLachlan). A mod. infection also occurred in a 7-acre field at Sherrington, Que. (R. Crête). Gold Spike carrots from a Grafton, N.S. field infected with blight in 1957 were examined in Jan., 1958. There was a serious blackening of the skin and the roots were unsuitable for packaging. On 9 July tr. infections occurred in the same field. Although sprayed with zineb in early Aug. the yield was somewhat reduced. Heavy losses were incurred in another 10-acre field. At Weston, N.S. wild carrots were found infected and it is suspected that this weed, which is prevalent in the Annapolis Valley, is providing an overwintering host for the fungus (K.A.H.).

STORAGE ROT (Cylindrocarpon radicicola). Isolations from carrots in storage in March at Clarence, N.S. yielded this organism (K.A.H.).

SCLEROTINIA ROT (S. sclerotiorum). Samples were received at the Vancouver, B.C. laboratory. Infection is usually general after warm weather harvesting (H.N.W. Toms). Specimens from Quebec City and Giffard, Que. were seen in Jan. (D.L.). Losses in the 1957 crop in common storage ranged from 5-100% in Kings Co., N.S. A 2% infection was noted in Nov. in stored carrots from the 1958 crop at Kentville (K.A.H.).

STORAGE ROTS (various organisms). Rotting carrots from storage at Quebec City yeilded Botrytis cinerea, Rhizopus nigricans, Verticillium albo-atrum and Fusarium spp. The Fusaria were predominant (D.L.).

YELLOWS (Aster yellows virus) was tr. in a field at Medicine Hat, Alta. (J.E. Moffatt). Late in Oct. a 15-acre field in the Dover Marshes, Kent Co., Ont. showed 80-90% of the plants with typical symptoms. In the LaSalle area, south of Windsor, Ont. 10-15% infections were recorded in several fields (C.D. McKeen). A home garden planting at Carleton Place Ont. was infected (V.R. Wallen). Tr. infections were seen in several fields at Ste. Clothide and St. Blaise, Que. (R. Crête). It was sev. at Ste. Foy, Que. (D.L.). Aster yellows was general on carrots in P.E.I. with some infections as high as 80%. The vector was present in abundance (J.E. Campbell). In Kings Co., N.S. the disease appeared late and caused little damage (K.A.H.). Light infections were seen at St. John's West, Nfld. (O.A. Olsen).

HEAT AND DROUGHT INJURY caused a deformity in the upper part of roots at Estevan, Sask. (T.C. Vanterpool).

CAULIFLOWER

WIRE STEM (Pellicularia filamentosa) was mod. in seed beds at Ste. Foy, Que. (D. Leblond).

CLUB ROOT (Plasmodiophora brassicae) continues to be a limiting factor in cauliflower production in some Vancouver Island market gardens (W.R. Orchard).

DAMPING OFF (various organisms). Severe loss of seedling plants occurred in some glasshouses in Queens and Sunbury counties, N.B. (S.R. Colpitts).

BORON DEFICIENCY was mod. in 1 field at Fincastle, Alta. (J.B. Lebeau).

WHIPTALL (Molybdenum deficiency) was also mod. in 1 field at Fincastle, Alta. (J.B. Lebeau). A 1-acre field at Oromocto, N.B. was a complete loss with no heads forming (S.R.C.).

CELERY

LATE BLIGHT (Septoria apii). A 10-15% infection caused sev. spotting on leaves and petioles in a market garden at Victoria, B.C. (W.R. Orchard). Some losses were incurred in the Leamington, Ont. area by growers who failed to apply a protective fungicide in the seedling stage. Further losses were prevented by thorough weekly spraying with Bordeaux 10-10-100 in the field (R.W. Walsh). It was sev. in a portion of a field at Cyrville, Ont. (D.S. MacLachlan), and sl.-mod. in a 5-acre field at Ste. Clothilde, Que. (R. Crête).

ASTER YELLOWS (Aster yellows virus) was tr. in several large fields at Ste. Clothilde, Que. (R. Crête).

CHINESE CABBAGE

LEAF SPOT (Alternaria radicina) was sl. at Ste. Foy, Que. (D. Leblond).

Diseases of Greenhouse Cucumbers in Essex Co., Ontario in 1958

R.W. Walsh

In Essex County, between 1 Jan. and 31 July, approximately 80 acres of greenhouse vegetables, 65 acres of cucumbers and 15 acres of tomatoes, are grown. This acreage does not include that devoted to the production of vegetable seedlings grown for early field crops.

In February low incidence of light and low temperatures were the limiting factors in the production of cucumbers. During the period 13-16 Feb. shortly after most of the seedling plants had been set in the ground beds, outside temperatures dropped to -10°F. Heating facilities in many greenhouse ranges were inadequate and inside temperatures ranged from 38-45°F. for several hours. These low temperatures chilled tender plants and left them wilted for 5-7 days. Within a week bright sunny days raised greenhouse temperatures to over 90°F. further injuring the plants.

After the plants experienced these great temperature fluctuations they suffered a sunburn injury that desiccated the leaf margins and caused appreciable collapse of interveinal tissues. About 40% of the crop was adversely affected by these conditions and required several weeks to recover fully. Of the injured crop, 10% was replaced with new plants three to four weeks later. These new plants outgrew and out-produced those that were injured.

Powdery mildew (Erysiphe cichoracearum), usually the most serious disease of greenhouse cucumbers in this area, first appeared in one or two greenhouses in mid-April. Spread was gradual and a few traces of the disease could be found in most crops by June, at which time two or three outbreaks were too well established to be controlled with Karathane applied as a dust or by smoke generators. In such cases sprays containing 1/2 lb. Karathane/100 gal. water plus a sticker gave good control when thoroughly applied.

By mid-March the effects of inadequate soil sterilization were evident by an increase, over previous years, in the number of outbreaks of root knot nematode, Meloidogyne sp. and foot rot caused by Fusarium sp. "Nemagon" soil fumigant applied to growing plant effectively checks nematode development. At the rate of 9.7 Imp. pints/acre, 0.5 cc. applied by injector 4 in. from the base of each plant, spread of the nematode was halted and new plant growth developed. Some growers used the material on mature "hardened" plants at rates as high as 34.8 Imp. pt./acre without apparent phytotoxicity. Foot rot is most readily controlled by through steam sterilization.

Stem rot, caused by Botrytis cinerea and Sclerotinia sclerotiorum became quite prevalent during a period of warm weather in mid-April. On a few nights when outside temperatures rose to about 65°F. automatic heating systems set to operate at 65°-67°F. did not turn on. In the absence of circulating warm dry air, condensation formed on the plants affording ideal conditions for the spread of these stem rot organisms.

Adjustment of the greenhouse humidity to prevent condensation on plants and the use of ferbam or thiram applied as dusts, sprays or paste checked the disease spread. In two cases where Botrytis cinerea was was causing fruit rot, gross loss per acre was about $1200.00 when approximately 4% of the fruit were attacked. Sclerotinia sclerotiorum destroyed a few fruit in another crop.

The leaf spot caused by Trichothecium roseum occurred throughout the area causing slight to moderate damage, but one or two crops suffered severe defoliation. Maneb applied thoroughly once a week at 3 lb./100 gal. controls the disease.

Scab (Cladosporium cucumerinum) could be found wherever growers had allowed temperatures to drop long enough for condensation to form on the fruit. In one instance where the grower stopped heating his crop in early June severe scab lesions developed on about 75% of the fruit causing considerable loss.

In February and early March injury from agricultural chemicals occurred quite frequently.

(1) More than 2,500 cucumber seedlings planted in ground beds treated with DD soil fumigant suffered severe root injury before the concentration of the chemical dropped to a non-toxic level. Development of the crop was retarded three to four weeks, a delay that represented a considerable financial loss to the grower.

(2) Sprays containing 25% malathion wettable powder, 2 lb./100 gal. applied to young plants caused "burning" of the leaf margins and interveinal chlorosis. Malathion applied six weeks later to older plants still caused a marked necrosis of interveinal leaf tissue.

(3) Two applications of 50% Perthane wettable powder, 2 lb./ 100 gal. applied one week apart also caused a severe chlorosis of tissue. The injury was not apparent until after the second spray was applied.

(4) One spray of the acaracide Aramite, used at the rate of 2 lb./100 gal., was the cause of a severe interveinal necrosis occurring on leaves within a few days of application.

In most of the cases where injury occurred sprays were applied to plants that had been forced into lush growth at a time when low light intensity favored the development of very thin leaf tissue that was probably more subject in injury.

Fertilizer burn was seen in several crops where excessive amounts of chemical fertilizer were applied. Leaves were damaged and plants were killed from ammonia fumes rising from too fresh manure that was applied as a mulch in some crops.

A 600-plant crop growing in a small Leamington greenhouse was destroyed when dithio pyrophosphate smoke generators were ignited to control greenhouse red spider mites, Tetranychus sp., on a cloudy morning in June. The sun later shone brightly rapidly raising the temperature in the sealed greenhouse to over 90°F. In another crop the leaves on a number of plants were burned while being fumigated with HCN.

Other Observations

LEAF SPOT (Alternaria cucumerina). A specimen was submitted to the Charlottetown, P.E.I. laboratory for diagnosis. It is commonly seen in plantings in P.E.I. in recent years (D.B. Robinson).

GRAY MOLD (Botrytis cinerea). Infections were seen in May on about 10% of the stems in a greenhouse planting at Falmouth, N.S. (K.A. Harrison).

SCAB (Cladosporum cucumerinum) was observed as a 30% infection in a 4-acre field of pickling cucumbers at Paris, Ont. The field had grown 3 successive crops of cucumbers (B.H. MacNeill). It was prevalent in Queens and Sunbury counties, N.B. Early crops were sl. affected but the late crop bore heavy infections. Home garden crops were affected throughout the province (S.R. Colpitts). In the St. John River valley, N.B., varieties other than the Maine and Wisconsin resistant strains were affected (J.L. Howatt). In P.E.I. infection was at its lowest level in 8 years (J.E. Campbell). It was more common than usual in garden plantings in N.S. (K.A.H.).

WILT (Fusarium sp.). Specimens from the Montreal, Que. area were received for identification at Ottawa (V.R. Wallen).

ANGULAR LEAF SPOT (Pseudomonas lachrymans) was sl. in 1 field at Medicine Hat and tr. in 1 field at Countess, Alta. (J.E. Moffatt). Tr. infection was found in a planting at Ste. Eustache, Man. (W.A.F. Hagborg). It occurred in a 3-acre planting of pickling cucumbers at Kingsville, Ont. Infection was mod. except in one-half acre portion of the field sown to cucumbers the previous year. In that portion plants were stunted and the crop reduced by 50% (R.W. Walsh). It was 2% in a garden plot at Oromocto, N.B. (S.R.C.).

WILT (Verticillium albo-atrum) was tr. in a 2-acre field at Narrows, N.B. (S.R.C.).

MOSAIC (Cucumber mosaic virus) was prevalent in a home garden at Summerland, B.C. It occurs in that garden annually and greatly reduces yields (G.E. Woolliams). In the Harrow-Leamington area of Ont. the Burpee hybrid cucumber, considered tolerant to mosaic, was sev. affected. As well as exhibiting foliage mottling many of the fruits showed a pronounced mottling. Many tons of fruit were rendered unmarketable. A heavy melon aphid infestation was responsible for spread of the disease in cucumbers and to other crops such as muskmelon, squash and pumpkin (C.D. McKeen). A sev. outbreak at the Exp. Farm, Kentville, N.S. wiped out a series of trials of slicing varieties (K.A.H.).

CHEMICAL INJURY. Sev. chlorosis and marginal necrosis of many leaves resulted when cucumber vines were sprayed late in the day with tribasic copper sulphate 6 lb. and 25% malathion W.P. 2 lb./100 gal. water at Colchester South, Ont. At the same place seedlings were burned following the application of liquid fertilizer sprays in accordance with the manufacturer's directions (R.W.W.).

EGGPLANT

LEAF SPOT (Ascochyta lycopersici). Mod. infections were seen at Ste. Foy, Que. (D. Leblond).

GARLIC

BULB ROT (Fusarium sp.) caused the yellowing of foliage, decay of outer bulb scales and rotting of the roots in 80% of the plants in a one-sixth-acre planting at Harrow, Ont. The symptoms were observed early in June (C.D. McKeen).

LETTUCE

GRAY MOLD (Botrytis cinerea). A head lettuce crop at Melanson, N.S. was 30% infected on 23 May and a complete loss by early July. At New Minas, N.S. Botrytis rot associated with tip burn caused the loss of 300/2000 plants (K.A. Harrison).

DOWNY MILDEW (Bremia lactucae) was mod.-sev. in several large fields on muck soil at Ste. Clothilde, Que. (R. Crête).

SOFT ROT (Erwinia carotovora) affected 50% of the plants in a field at Haldiman, Que. High humidity in late Aug. and early Sept. favored its development (L.J. Coulombe).

DROP (Sclerotinia sclerotiorum) caused a 10% loss in a crop at Ste. Anne de la Pocatiere, Que. (R.O. Lachance).

YELLOWS (Aster yellows virus). Ten-15% of the plants in head lettuce crops at La Salle, Ont. were infected in Oct. (C.D. McKeen). Infection was light in several fields at Ste. Clothilde, Que. (R. Crête). At Cornwall, P.E.I. a market gardener lost 80% of his late lettuce crop from yellows. Adjacent carrots were heavily infected (J.E. Campbell).

BIG VEIN (? Olpidium sp.). This disease, known to occur in many of the vegetable growing areas of the United States and also in Europe was observed in the spring head lettuce crop in Essex Co., Ont. The symptoms consist of a pronounced early vein clearing followed by enlargement and bleaching of the vascular regions of the petioles and leaf blades, vein banding and savoying of the leaves. In some fields 60% of the plants were affected and the crop headed very unevenly. For many years big vein was considered to be caused by a soil-borne virus. However, Grogan et al (Phytopathology 48:292-297, 1958) presented evidence that a species of Olpidium is associated with the disease. In the Ontario outbreak no attempt was made to determine whether the roots of affected plants were invaded by this fungus (C.D. McK.).

LIMA BEAN

SCLEROTINIA ROT (S. sclerotiorum). A 10-acre field near Chatham, Ont. was sev. infected. In many places the mycelium completely covered the damp earth between the rows and extended far up the stems of plants. Three weeks before harvest it was estimated that only about 60% of the field could have been harvested (R.W. Walsh).

MELON

ANTHRACNOSE (Colletotrichum lagenarium) was more widespread and caused more damage in Essex and Kent counties, Ont. than at any time in the last 8 years. Losses ranged from 25-100% in fields of varying sizes. Zineb sprays applied early checked the disease. It is apparent that seed treatment and a regular spray program will have to be a regular adjunct to melon production (R.W. Walsh).

BACTERIAL WILT (Erwinia tracheiphila) killed 25% of the plants in a 1-acre field at Tecumseh, Ont. Control of cucumber beetles had not been attempted (R.W.W.).

FUSARIUM WILT (Fusarium bulbigenum var. niveum). The susceptible variety Perfection was 75% killed in a 1-acre field at Harrow, Ont. (R.W.W.).

MOSAIC (? Muskmelon mosaic virus). A 1-acre field in Gosfield South, Ont. was 100% infected and suffered heavy damage. Aphid populations were high. Several other infections were observed throughout the season in Essex Co. The disease was at its highest incidence in 4 years (R.W.W.).

ONION

PURPLE BLOTCH (Alternaria porri) affected the Spanish-type varieties Riverside and Magnifico, particularly the latter, in Mersa Twp., Ont. Infections were heavy and the yield reduction was estimated at 20-25%. Foliage was killed about 3 weeks before the normal maturity date. Weekly applications of 10% zineb dust failed to check the disease this year (R.W. Walsh).

NECK ROT (Botrytis allii). A 20% infection was recorded in Kamouraska Co., Que. (R.O. Lachance). Light infections were seen on stored onions at Charlottetown, P.E.I. (J.E. Campbell). At Berwick, N.S. the variety Autumn Spice was 5% infected at harvest and specimens were received at the Kentville laboratory from Birch Cove, Cape Breton (K.A. Harrison).

SMUDGE (Colletotrichum circinans). At Erieau, Ont. over 75% of the crop from a half-acre field of white skin onions was unmarketable because of smudge. This grower has experienced similar losses for 3 years (R.W.W.). Specimens from St. Martin, Que. were received at the St. Jean laboratory (R. Crête). One specimen was seen on the market in Quebec City (D. Leblond).

DOWNY MILDEW (Peronospora destructor) was observed in several Vancouver Island market gardens where high infection rates resulted in sev. injury (W.R. Orchard). It was sev. at Lac des Aigles, Que. (D.L.). The variety Kenearly and some new lines were 100% infected at the Exp. Farm, Kentville, N.S. (K.A.H.).

YELLOW PATCH (Pythium irregulare). About 10% of the seedlings in 300 flats were killed by this disease at Tecumseh, Ont. (R.W.W.).

SMUT (Urocystis cepulae) was observed on Yellow Globe Danvers in several fields at Kelowna, B.C. It appears to be increasing in severity in this district (G.E. Woolliams).

BLAST (unfavorable weather condtions) was mod.-sev. in a 15-acre block at St. Blaise, Que. (R. Crête).

PEA

Pea Disease Survey in certain localities in Ontario, 1958

V.R. Wallen

In 1958, fifteen pea fields were surveyed as follows: twelve fields of canning peas, two fields of field peas and one field of garden peas. The canning peas, with the exception of two fields located near Markham, were all located in the Windsor area. The most prevalent and destructive disease found in the fields examined was pea streak.

Pea Streak (? pea streak virus) was present in slight to severe amounts infecting 20 per cent of the crop in a field of Alton garden peas at Ottawa. This field appeared yellow despite excellent growing conditions during pod formation. At maturity numerous plants did not set seed. Pea streak was also severe in a number of hybrid lines of field peas growing on the Central Experimental Farm. Some lines did not produce any seed. Pea streak was present in trace to moderate amounts in five fields of canning peas in the Windsor area.

Root Rot (Ascochyta pinodella, Fusarium sp.) was present in six fields of canning peas in the Windsor area in trace amounts. Ascochyta pinodella was the cause of the root rot in at least two of the six fields. In the Markham area extremely dry conditions had prevailed and the crop was light. Despite this condition root rot was present in 40 per cent of the crop. A species of Fusarium appeared to be responsible.

Common Mosaic (pea mosaic virus) was found in trace amounts in six fields of canning peas in the Windsor area. One field in the same area where aphid control had not been practiced was moderately infected with the disease.

Pea Enation Mosaic (pea enation mosaic virus) was found in trace amounts in six fields in the Windsor area. This disease was also present as a trace in a field of garden peas at Ottawa.

Pea Stunt (Red clover vein mosaic virus) occurred in one field in the Windsor area causing slight loss to the pea crop.

Bacterial Blight (Pseudomonas pisi). A moderate infection of the leaves and a trace infection on pods was found in a field of Arthur field peas at Ottawa

Mycosphaerella Blight (Mycosphaerella pinodes). A trace infection was located in one field of garden peas at Ottawa.

Leaf and Pod Spot (Ascochyta pisi) was found in trace amounts in one field of canning peas in the Windsor area.

Other Observations

FOOT ROT (Ascochyta pinodella) was sev. at St. Gabriel and St. Pierre Isle Orleans, Que. (L.J. Coulombe).

LEAF AND POD SPOT (Ascochyta pisi) was 1-mod./18 Alta. fields (J.E. Moffatt). In Man. 8/17 fields in the Portage la Prairie and Oakville areas had tr.-sl. infections (W.A.F. Hagborg). Pod infection was 20% at Colinet, Nfld. (O.A. Olsen).

POWDERY MILDEW (Erysiphe polygoni). Damage was generally sev. in gardens in the Saskatoon, Sask. area (R.J. Ledingham). It was tr. in 1/17 Man. fields (W.A.F.H.). Powdery mildew was widespread in N.B. but damage was light (S.R. Colpitts).

NEAR WILT (Fusarium oxysporum f. pisi. race 2). Traces of near wilt, first reported 3 years ago, have now been recorded in nearly all the areas of commercial pea production in s.w. Ont. A 10-acre field of Pride peas near Brantford which appeared to be badly affected with near wilt produced, according to the processor, only about 50% of the expected yield (B.H. MacNeill).

MYCOSPHAERELLA BLIGHT (M. pinodes). Infections were tr.-sl. in 4/17 fields examined in Man. (W.A.F.H.).

DOWNY MILDEW (Peronospora pisi) was 1-mod./18 fields in Alta. (J.E.M.). One field at Bridgetown, N.S. had a 2% infection in June (C.O. Gourley).

BACTERIAL BLIGHT (Pseudomonas pisi) was 11-tr./18 Alta. fields (J.E.M.). It was 4-sl. 1-mod. 1-sev./17 fields in Man. (W.A.F.H.).

LEAF BLOTCH (Septoria pisi) was 1-tr./18 fields examined in Alta. (J.E.M.).

ROOT ROT (various organisms) was 8-tr. 4-sl. 2-mod. 3-sev./18 fields in Alta. and caused an estimated 5% loss (J.E.M.). Specimens from Langham, Sask. were infected with Fusarium and Ascochyta (T.C. Vanterpool). It was 1-tr. 1-mod.-sev./17 fields in Man. (W.A.F.H.). Fusarium root rot was seen at New Richmond, Que. (D. Leblond). Infection was 60% at Fredericton, N.B. and damage was mod. (S.R. Colpitts).

RUST (Uromyces fabae). A 5% infection occurred in a small garden plot at Salisbury, N.B. (S.R.C.). At Kentville, N.S. a light late infection caused negligible damage (K.A.H.).

MOSAIC (Pea mosaic virus). Heavy aphid infestations in Kings Co., N.S. were followed by outbreaks of mosaic in fields where aphids were not controlled early (K.A.H.).

PHYLLODY (? virus). Typical symptoms were observed on a single plant in a garden at Ste. Anne de la Pocatiere, Que. (R.O. Lachance).

MARSH SPOT (Manganese deficiency). Two samples of split peas from carload lots, one grown at Aylesham, Sask. and the other purchases at Morris, Man. but of unknown origin, had the central internal necrosis typical of marsh spot (W.A.F.H.).

PEPPER

VERTICILLIUM WILT (V. ? dahliae). Two pepper fields at Harrow, Ont. were sev. affected. The variety Vinedale has proven to be highly susceptible to Verticillium wilt (C.D. McKeen).

BACTERIAL SPOT (Xanthomonas vesicatoria). At Harrow, Ont. most of a planting of 56,000 pepper plants grown for processing had leaf and fruit symptoms of this disease. Fruit spotting was sufficiently sev. for the processor to reject the field and it was disced under (R.W. Walsh).

VIRUS DISEASES. In 1958 most of the pepper crops in s.w. Ont. became infected with one or more aphid-borne viruses. Losses ranged from 10-15%. The following viruses were isolated and identified: Potato Y, Cucumber mosaic, Alfalfa mosaic and Tobacco etch. Tobacco mosaic virus was also found affecting a few plants in 1 crop. Tobacco etch virus appeared in Ont. in 1950 and since that time has recurred each year in tobacco and pepper crops in the Harrow-Leamington area (C.D.McK.).

The data presented in Tables 10 to 12 relevant to Seed Potato Certification were submitted by the Plant Protection Division, Production Service, Canada Department of Agriculture.

The total acreage entered for inspection in 1958 and the number of acres passed both exceeded the comparable figures for the last three years. The large acreage of Sebago planted in P.E.I. accounted for 44% of the total. Two new varieties, Fundy and Avon, were released to seed growers in the Maritime Provinces. Ring rot and black leg were again the most important causes of rejection. The number of fields rejected because of leaf roll and mosaic was greater than in 1957.

EARLY BLIGHT (Alternaria solani) was found in 116/600 fields inspected in B.C., 94-sl. 20-mod. 2-sev. It was most prevalent in the Grand Forks and Okanagan districts (N. Mayers). It was present in most of the 91 fields inspected in n. Alta. where it hastened maturity in some fields of Warba (E.C. Reid). Sl.-mod. infections were observed in 12/112 seed fields in s. Alta., mainly on early varieties (R.P. Stogryn). It was sl. in the northern districts of Sask. (A. Charlebois). A few sl. infections appeared late in the season in Man. and n.w. Ont. (D.J. Petty). Early blight reduced the yield of Keswick and was also prevalent on Irish Cobbler in Ont. District #3 (H.W. Whiteside), tr. infections were seen on Katahdin in the Mount Brydges area of s.w. Ont. (J.T. McKercher), sl. amts. were seen in Durham, Northumberland and Ontario counties of Ont. at the time of the second field inspection (W.L.S. Kemp), and it occurred as 51-sl. 1-mod. infections /70 fields in e. Ont. (E.H. Peters). In Que. early blight was recorded as 238-sl. 48-mod. 1-sev./1,040 fields. It was most prevalent in the Chicoutimi and Lake St. John districts (B. Baribeau). Sl. infections were seen in a few fields of Keswick and Warba in York Co., N.B. (C.H. Godwin). It was very sl. in P.E.I. (H.L. McLaren). In N.S. it was reported in 17/233 fields inspected. No sev. infections were seen in 1958 (R.C. Layton). Mod. infections were encountered in the St. John's and Conception Bay areas of Nfld. (O.A. Olsen).

GRAY MOLD (Botrytis cinerea) caused a leaf spot in tr. amts. on Arran Victory at St. John's West, Nfld. (O.A.O.).

BLACK DOT (Colletotrichum atramentarium) occurred as a tr. infection on Irish Cobbler at Pleasant Grove, P.E.I. (J.E. Campbell). A planting of Keswick at Kentville, N.S. was 100% infected. The tops died down much earlier than normal (K.A. Harrison).

Table 10. Seed Potato Certification

Summary of Fields and Acres Entered and Passed - 1958

Province	Fields Entered	Fields Passed	% Passed	Acres Entered	Acres Passed	% Passed
P.E.I.	6,099	5,508	90.3	31,428	28,345	90.2
N.S.	233	184	78.9	493	333	67.5
N.B.	2,338	2,045	87.4	15,616	12,801	81.1
Que.	1,040	631	60.7	3,793	2,227	58.7
Ont.	544	478	87.8	1,660	1,086	65.4
Man.	123	106	86.1	1,088	944	86.7
Sask.	70	56	80.0	177	151	85.3
Alta.	203	172	84.7	1,615	1,306	80.9
B.C.	601	489	81.3	2,985	2,260	75.8
Totals	11,251	9,669	85.9	58,855	49,456	85.3
1957	11,417	9,879	86.5	57,667	48,588	84.2
1956	11,440	9,575	83.3	53,926	44,398	82.3
1955	12,003	10,239	85.3	51,627	42,173	81.7
1954	13,783	11,959	86.8	59,360	50,687	85.4

Table 11. Seed Potato Certification

Fields Rejected on Field Inspections - 1958

Province	Leaf Roll	Mosaic	Ring Rot in field on farm		Black Leg	Wilts	Adjacent Diseased Fields	Foreign Varieties	Misc.	Total
P.E.I.	3	72	16	31	177	16	17	184	62	578
N.S.	7	11	1	3	6	1	11	6	1	47
N.B.	2	14	100	60	6		8	80	13	283
Que.	6	98	102	61	82		37	12	4	402
Ont.	13	6	19	31	23	3	1	7	4	107
Man.	1	1	3	5		2			5	17
Sask.	1		1	6	2	2			2	14
Alta.			6	16	9					31
B.C.	64						19	15	5	103
Totals	97	202	248	213	305	24	93	304	96	1,582
Rejection as a percentage of fields										
Inspected	0.8	1.8	2.2	1.9	2.7	0.2	0.8	2.7	0.8	14.1
Rejected	6.1	12.8	15.7	13.4	19.3	1.5	5.9	19.3	6.0	100.0

Table 12 Seed Potato Certification

Acreage Passed by Variety and Province - 1958

Variety	P. E. I.	N. S.	N. B.	Que.	Ont.	Man.-Alta.	B. C.	Total
Sebago	21,752	21	193	30	324		3	22,323
Katahdin	1471	17	5678	182	207		8	7,563
Kennebec	1793	126	3461	361	19	13	165	5,938
Netted Gem	4	20	663		2	1368	1691	3,748
Irish Cobbler	2024	38	410	53	79	169		2,773
Green Mountain	667	27	136	1421	41	7	31	2,330
Red Pontiac	324	11	1507			319	68	2,229
Keswick	102	15	313	151	72		3	656
Warba	17	4	16		12	153	90	292
Huron	2		12	4	214	1		233
Pontiac		3	142			29		174
Canso	150		8	1				159
Chippewa	4	1	40		113			158
White Rose			50			2	105	157
Rural Russet			147		1			148
Columbia Russet						99	6	105
Others	35	51	25	24	2	243	90	470
Total	28,345	334	12,801	2,227	1,087	2,402	2,260	49,456

BACTERIAL RING ROT (Corynebacterium sepedonicum) was found in tr. amts. in one seed crop and 4 tablestock crops in B.C. (N.M.). It was absent in n. Alta. (E.C.R.), and was tr. in 6/112 fields in s. Alta. Sixteen other adjacent fields were rejected (R.P.S.). Ring rot caused the rejection of 7/70 fields inspected in Sask. (A.C.). Twelve infected specimens were received from growers at Saskatoon, suggesting that the disease may be increasing in Sask. (R.J. Ledingham). Three fields in Man. and 1 in n.w. Ont. were found infected. Five other Man. fields were rejected because of suspicion of contamination (D.J.P.). In Ont. District #3, 19/373 fields inspected were rejected for ring rot and 31 adjacent fields turned down. Infection ranged from tr.-2% in individual fields. The use of custom planters seemed to be a contributing factor to the incidence of the disease (H.W.W.). One small field of Rural Russet in Durham Co., Ont. was rejected as coming from a known contaminated seed source (W.L.S.K.). Ring rot occurred in 102/1,040 fields inspected in Que. At harvest and bin inspection an additional 9 fields were rejected. This represents a great reduction over the number of rejections for ring rot in 1957. This reduction seems to be a reflection of the greater care taken by growers and the general use of quaternary ammonium compounds for disinfecting implements and premises. (B.B.). A 3-acre field of table stock was sev. infected at St. Pascal, Kamouraska Co., Que. and 34 others in the lower St. Lawrence district showed tr.-10% infections. Conditions were generally favorable for the detection of symptoms (H. Genereux). In N.B. 100/2,338 fields inspected showed symptoms of ring rot and an additional 60 fields were rejected because of infected table stock crops on the same farms. There was a sl. increase in the prevalence of ring rot in N.B. over the 1957 figures. (C.H.G.). Sixteen infected fields and 23 contact cases were reported /6,099 fields in P.E.I. A total of 418 acres were involved (H.McL.). Ring rot was found in 1/233 fields of seed potatoes in N.S., 2 fields from the same seed source were rejected, though showing no symptoms, and 2 other fields were rejected because of proximity to diseased table stock. In a survey of table stock potatoes in Kings Co., 11 fields totalling approximately 45 acres were found infected in amounts from tr.-4% (R.C.L.).

BLACK LEG (Erwinia atroseptica) was 41-tr. 2-mod. 1-sev./601 fields in B.C. Table stock crops of Waseca were heavily infected in the Okanagan Valley and there were marked increases in its occurrence at Grand Forks and in the Kootenays (N.M.). It caused the rejection of 9/91 seed stock fields in n. Alta. and was present in all seed varieties. It appears to be the most serious threat to certified seed production in n. Alta. (E.C.R.). It occurred in 78/112 fields inspected in s. Alta. and continues to be the most prevalent potato disease in that irrigated area (R.P.S.). It was sl. in Netted Gem at Medicine Hat, Alta. (J.E. Moffatt). In Sask. 25/72 fields showed some black leg infection on first inspection. Two fields were rejected (A.C.). In Man., 13% of the fields

inspected showed tr.-sl. infections, and in n.w. Ont., 30% of the fields were infected (D.J.P.). This disease was present in 86/373 fields in Ont. District #3 and caused rejection of 19. Sebago, Keswick, Kennebec, Rural Russett and Irish Cobbler seemed particularly susceptible (H.W.W.). More than a dozen cases of black leg in Irish Cobbler were encountered in Mersa Twp. in Essex Co., Ont. Losses ranged from 5-10% even in crops where seed piece treatment with captan and streptomycin had been carried out. Many of the tubers were infected with soft rot at harvest (R.W. Walsh). Light infections were seen in 20/33 fields inspected in s.w. Ont. (J.T.McK.). A few infected plants of Irish Cobbler from Lincoln Co. were examined at the St. Catharines laboratory (G.C. Chamberlain). Three fields were rejected in the Guelph area (W.L.S.K.). It was recorded in 19/70 fields in e. Ont. (E.H.P.). Black leg increased in prevalence in seed stocks in Que. It was recorded in 607 and caused rejection of 82/1,040 fields inspected (B.B.). It was observed in most of 35 table stock fields examined in the lower St. Lawrence district (H. Genereux). Black leg decreased in incidence in N.B. and only 6/2,338 fields were rejected (C.H.G.). In P.E.I. 177/6,099 fields were rejected (H.McL.). It was reported in 65/233 seed fields in N.S. and caused the rejection of 6 fields (R.C.L.). Black leg occurred on 2% of the plants of Kennebec in the Bonavista Bay area and on 1% of Arran Victory in the Conception Bay area of Nfld. (O.A.O.).

SOFT ROT (Erwinia carotovora). Specimens were received from Quebec City, St. Thomas de Caxton and St. Nicholas Station, Que. (D. Leblond).

DRY ROT (Fusarium spp.). F. coeruleum was isolated from a sample taken at Calgary, Alta. Dry rot was seen in 1/5 fields examined (J.E. Moffatt). Infections ranging from 6-8% were observed in a few lots of Keswick in Que. in the spring shipping season (B.B.). Sl. infections were recorded in Keswick in N.B. following adverse storage conditions (C.H.G.). It was generally sl. in P.E.I. (H.L.McL.). Three carloads of Foundation Katahdin seed originating in P.E.I. was found to be 30% infected on arrival in Montreal. The causal organism when isolated proved to be F. coeruleum (D.S. MacLachlan, R.A. Shoemaker). In N.S., F. sambucinum associated with a Pythium sp. caused 15% loss in Cherokee from Merigomish, Pictou Co. (K.A.H.).

WILTS (Fusarium spp., Verticillium albo-atrum) were of minor importance in B.C., appearing as tr. infections in 7/601 fields (N.M.). They occurred in 12/91 fields in n. Alta. (E.C.R.) and in 53/112 fields in s. Alta. (R.P.S.). Wilt was noted in 17% of the Sask. fields inspected but was sev. only in 3 fields of Cherokee (A.C.). In Man., 13% of the fields had varying degrees of wilt and 3 fields of Cherokee were rejected (D.J.P.).

Fusarium wilt was present in most fields and varieties in Ont. District #3. Verticillium wilt was not a problem (H.W.W.). In s.w. Ont. 2 fields of Kennebec were rejected (J.T. McK.). Six infected fields were found in the Guelph district (W.L.S.K.), and in e. Ont. 11/70 fields were infected (E.H.P.). Verticillium wilt, mostly on Keswick and Kennebec, affected 14/1,040 fields in Que. (B.B.). Fusarium wilt was sev. at Sillery, Que. (D. Leblond). No fields were rejected in N.B. though 17/2,338 fields carried tr. amts. (C.H.G.). The incidence of wilts in P.E.I. declined in 1958, only 16/6099 fields were rejected (H.L.McL.). Verticillium wilt was reported in 39/233 fields in N.S. and 1 field was rejected for wilt. Kennebec, Irish Cobbler, Sebago, Cherokee and the new variety Fundy were the most sev. affected (R.C.L.).

RHIZOCTONIA (Pellicularia filamentosa) was widespread throughout B.C. and was rated 300-sl. 119-mod. 16-sev./601 fields. In s.e. B.C. it caused considerable losses to some growers (N.M.). It continues to be found in most seed stocks in n. Alta. (E.C.R.). Premature wilting of vines in large areas of fields was observed in the Edmonton area (W.P. Campbell). It was 70-sl. 8-mod./112 fields in s. Alta. Sclerotia were present on 10-15% of the tubers at bin inspection (R.P.S.). Infection was noted in most Sask. fields but it is believed to have caused little damage as compared with 1957 (A.C.). It was sl. in most fields in Man. and n.w. Ont. (D.J.P.). Sev. field symptoms were observed in Dufferin Co., Ont. (H.W.W.). Irish Cobbler, Katahdin, Warba and Sebago were sl. affected in s.w. Ont. (J.T. McK.); in the Guelph district the organism is widely distributed in soils (W.L.S.K.), and in e. Ont. 29/70 fields were infected (E.H.P.). Infection was 133-sl. 3-mod./1,040 fields inspected in Que. and was mostly confined to the Chicoutimi, Lake St. John and Saguenay districts (B.B.). At Ste. Anne de la Pocatiere the varieties Chenango and King Edward were highly susceptible in sandy soil and Saco was susceptible in loamy soil (H. Genereux). It was sl. in a few fields in N.B. and sl. tuber infection was seen in a few fields at shipping time (C.H. Godwin). Rhizoctonia was not a serious disease in N.S. in 1958. The average infection was about 2% (R.C. Layton). A sev. infection was recorded on Irish Cobbler at Winterbrook, Nfld. Infections were light at St. John's West and Bay Roberts (O.A.O.).

LATE BLIGHT (Phytophthora infestans) was reported 25 June at Saanichton, B.C. with an 80% infection in a field of Warba, and lesser infections in White Rose. Netted Gem suffered mod. foliage infections but no tuber rot was reported (W.R. Orchard). It was recorded as 17-sl. 3-mod./601 fields in B.C. (N.M.). The disease was fairly general throughout Ont. District #3 with Katahdin and Rural Russet the most seriously affected varieties with considerable tuber rot (H.W.W.).

It was recorded in several fields in s.w. Ont. (J.T. McK.) and was late in appearing in the Guelph, Ont. district. The greatest losses were in late planted crops of Chippewa and Katahdin (W.L.S.K.). Eight fields and 4 bins were affected in e.Ont. The disease appeared early in Aug. in Prescott Co., but did not appear until late September in Renfrew Co. (E.H.P.). Late blight was first observed in the lower St. Lawrence district of Que. in Temiscouata Co. on 23 July, about 2 weeks later than last year. Weather conditions throughout Aug. were favorable for its development and spread and by early Sept. it was epidemic throughout the province affecting all varieties. Tuber infection was observed in many fields. The extensive use of vine killers reduced tuber infection to a great extent. Infections in seed fields were rated 313-sl. 176-mod. 30-sev./1,040 fields. Losses in unsprayed fields ranged from 20-35% (B.B.). Tuber rot was 45% in an unsprayed field at Ste. Foy, Que. (D.L.).

Blight was sev. throughout N.B. in 1958 and was especially destructive in late-planted crops. Although reported from several areas the week of 17 July infection did not become sev. until late Aug. Crop reductions of as much as 50 bbl./acre were caused by the destruction of vines. Tuber rot was held to a minumum by a program involving good hilling and vine killers (H.L. McL., J.L. Howatt). Late blight occurred earlier than usual in P.E.I. Infected cull piles were observed on 15 July and the first field infections on 16 July. It spread rapidly and an epiphytotic developed. Adequate spraying and the use of vine killers kept losses generally at a minimum, but poorly sprayed fields suffered yield reductions and further losses from tuber rot (L.C. Callbeck). In N.S. the first infected cull pile was seen on 11 July. Spread was slow until late Aug. when several heavy rains occurred. Tuber rot was sev. and losses have been extensive in some cases (K.A. Harrison). Blight was reported in 45/233 seed fields inspected in N.S. It was general throughout the province by 20 Aug. Losses from tuber rot occurred even in some sprayed fields, particularly in Kennebec. A loss of 15-20% is estimated for the province as a whole (R.C.L.). Losses were not heavy in Nfld. in 1958. Blight appeared late and weather conditions were not particularly favorable for its development. Tuber rot was not reported (O.A. Olsen).

Distribution by Provinces of Physiologic Races of Phytophthora infestans in Canada in 1958

J.L. Howatt

The Fredericton Laboratory conducted for the fifth consecutive year a survey to determine the races of the late blight fungus occurring in the country during the growing season of 1958. A summation to November 18 reveals that 273 collections were examined and 363 isolates identified as to race from seven provinces. The collections obtained were in the form of leaves, tubers, potato balls and tomato fruits. The results of the survey are presented in Table.

Table 13

Physiologic Race	Provinces							
	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	B.C.	Total
1		4	17	2	4		3	30
2				1	2		1	4
3		1	25	3	13	2	4	48
4	2	7	82	8	44	6	4	153
1.2			2		1			3
1.3		2	13	1	7		1	24
1.4		4	38	10	20			72
2.3				1			1	2
2.4				1	3			4
3.4			8	4	6		1	19
1.3.4				1	1			2
1.2.3.4			2					2
	2	18	187	32	101	8	15	363

The results are based mainly on a single determination on the differential hosts. Race 4 appears to be the common race encountered but this may be due to the possible masking of race O. Race 1,4 is the second most prevalent form. The field records of this survey reveal several inconsistencies with regard to the race involved and the variety attacked In this compilation it was noted that the more specialised races of the fungus tended to develop in areas where blight resistant potatoes were

being tested. The two collections of race 1,2,3,4 were received from Nova Scotia in March. One of these races was isolated from tomato and the other from potato. These collections were misleading in that they registered as race 1,2,4 when received but in subsequent tests they registered on all the genotypes as a severe form of race 1,2,3,4.

LEAK (Pythium ultimum) affected 3 crops in central B.C. and 3 in the Pemberton district. All crops examined in s.e. B.C. were infected and some had as many as 5% of the tubers affected (N.M.). In Sask. the absence of a killing frost before 15 Sept. resulted in the harvest of many poorly matured tubers in the late varieties. There was considerable early storage breakdown. Five cases were investigated and in each case Pythium sp. was isolated (R.J. Ledingham). Early harvested crops in Man. had 2-5% infected tubers in the bin soon after harvest (D.J.P.); from 1/2-2% of the tubers of early varieties at the University of Man. were infected (W.C.McDonald). At Ste. Anne de la Pocatiere, Que. it was sev. on Irish Cobbler in loamy soils. Teton, grown in sandy soil, was free of infection at harvest but was 10% infected after 1 week in storage (H. Genereux). A 10% infection in Cherokee was recorded at Merigomish, N.S. Pythium sp. was isolated from diseased tubers (K.A.H.).

POWDERY SCAB (Spongospora subterranea). Trace infections on Netted Gem at Cedar, B.C. lowered the grade of tubers (W.R. Orchard). Sl.-mod. infections were seen in 8 bin lots inspected in Que. (B.B.). A tr. infection was seen on Bliss Triumph at Glenmont, N.S. (K.A.H.), and a light infection occurred on Fredericton seedlings at St. John's West, Nfld. (O.A.O.).

COMMON SCAB (Streptomyces scabies) caused damage to white-skinned varieties in B.C. but Netted Gem was little affected (N.M.). It was present in some seed stocks in n. Alta. and in some instances affected even the normally resistant Netted Gem (E.C.R.); sl. infections were seen on some smooth skinned varieties in s. Alta. (R.P.S.). In Ont. District #3 the incidence of scab was slightly lower than in 1957. It was observed causing superficial lesions on the resistant Huron variety in the Lafontaine area (H.W.W.). Sl. infections were general in s.w. Ont. (J.T.McK.). Common scab is one of the commonest troubles in Bruce, Grey, Dufferin, York, Waterloo and Wellington counties in Ont. The pH of the soils is high and sl. scab averages 20-25% and sev. scab 10-15% (W.L.S.K.). It was prevalent in Renfrew Co., Ont. Little or no scab was seen on Rural Russet and Huron (E.H.P.). Scab was reported in 315 bin lots inspected in Que. in the fall of 1958. It was mostly confined

to the n.e. portion of the province. Infection was generally 1/2-2% but a few severe cases reached 25-50% (B.B.). A 50% infection was seen on Waseca at Ste. Anne de la Pocatiere (H. Genereux). It was less prevalent than in previous years in N.B. (C.H. Godwin), and mod. in P.E.I. (H.L.McL.). The average loss from scab in grading in N.S. was about 3%. One lot graded 25% scab (R.C.L.). Light infections were seen in the St. John's and Conception Bay areas of Nfld. (O.A.O.).

WART (Synchytrium endobioticum). Infections were generally heavy in the St. John's and Conception Bay areas of Nfld. and the disease has spread to land not previously infested. Yield reductions of 75% were reported from Conception Bay. In experimental plots at Bay Roberts yield was reduced 50% in infected Arran Victory, Kerr's Pink and Irish Cobbler (O.A.O.).

SEED PIECE ROT (various fungi). A 6-acre field of Irish Cobbler in Mersa Twp., Ont. had only a 35% stand due to the rotting of seed pieces (R.W. Walsh).

CALICO (Alfalfa mosaic virus) was more prevalent in s.e. B.C. than in 1957 (N.M.).

LEAF ROLL (Potato leaf roll virus) caused the rejection of seed fields in all provinces except Alta. and Nfld. It was generally more prevalent than in 1957. A few specimen reports are cited below (D.W. Creelman).

It was recorded as 142-tr. 33-sl. 31-mod. 3-sev./601 fields in B.C. It remains the biggest potato disease problem in the province. It is estimated that 2,500 tons of Netted Gem have been reduced in grade from #1 to #2 or culls because of leaf roll necrosis (N.M.). Though present in 44/203 Alta. fields the infections were light (E.C.R., R.P.S.). In Ont. District #3 it occurred in 126/373 fields. Cherokee, Keswick, Warba, Chippewa and Huron were the varieties most affected (H.W.W.). Fields of Huron were infected in the Guelph district (W.L.S.K.). and in s.w. Ont. (J.T.McK.). It was recorded in 105/1,040 fields in Que. (B.B.). A 2-acre field was sev. affected at St. Antoine Abbé (R. Crête). Leaf roll continues to be of minor importance in N.B. (C.H. Godwin), and decreased in P.E.I. in 1958 (H.L.McL.). In N.S. it was reported in 85/233 fields inspected and caused the rejection of 7. Kennebec, Irish Cobbler, Sebago and Netted Gem in that order were the varities most affected (R.C.L.). It was recorded as 3-sl. 1-sev./15 fields examined on the Avalon Peninsula in Nfld. (O.A.O.).

MOSAIC (Potato viruses X, A and Y) were reported from all provinces and were resonsible for the rejection of seed fields in 6 provinces, notably in Que. and P.E.I. Representative reports only will be given here (D.W.C.).

Mosaic was 25-tr. 1-sl./601 fields in B.C. It was most prevalent in the Lower Mainland, Lulu and Sea Islands and on Vancouver Island (N.M.). It occurred in tr. amounts only in Alta. (E.C.R., R.P.S., J.E. Moffatt), was sl. in 15/70 fields in Sask. (A.C.) and was of no consequence in Man. (D.J.P.). Only 6/544 Ont. fields were rejected for mosaic (D.J.P., H.W.W., E.H.P.). Mosaic increased in Que. in 1958 and was found in 470/1,040 fields; 98 fields were rejected (B.B.). In N.B. 14/2,338 fields were rejected (C.H.G.). P.E.I. returns showed a slight increase in mosaic over 1957; 72/6,099 fields were turned down (H.L.McL.). Mosaic continues to be the most serious virus disease problem in N.S. It was found in 125/233 fields in 1958. Eleven fields were rejected. (R.C.L.). It was reported as occurring in the St. John's and Manuels areas of Nfld. (O.A.O.).

PURPLE TOP (Aster yellows virus) was found in 25/91 fields inspected in n. Alta. (E.C.R.). Little was seen in seed fields in Sask. (A.C.) and it was less than 1% in 2 fields examined near Saskatoon (R.J. Ledingham). Its incidence in the n. portion of Ont. District #3 was greater than in 1957. Katahdin, Sebago and Rural Russet were particularly affected (H.W.W.). Purple top has decreased in prevalence in N.B. in the last 3 years and was observed as tr. infections only in a few seed fields in 1958 (C.H.G.).

SPINDLE TUBER (Potato spindle tuber virus) was found in several plants in 1 field of Waseca in s. Alta. (R.P.S.). In Man. 4 fields of Kennebec with 2-8% spindle tuber were rejected (D.J.P.). Huron has been observed to be quite susceptible in Ont. District #3, spindle tuber occurring in varying percentages in every lot grown. Katahdin and Sebago were also affected (H.W.W.). It was observed in 1 field of Katahdin in s.w. Ont. (J.T. McK.). In e. Ont. Huron and Sebago were affected in several fields (E.H.P.). Sl. infections were seen in a few fields of Kennebec in Que. and 2/430 bins inspected showed tr. amounts (B.B.). In N.B. the incidence of spindle tuber was slightly greater than in 1957. Three/2,338 fields were rejected but tr. infections were recorded in a number of other fields, particularly in Kennebec, Netted Gem and Sebago (C.H.G.). A marked decrease was observed in P.E.I. in 1958 (H.L. McL.). In N.S. it occurred in 3/233 fields inspected (R.C.L.).

WITCHES' BROOM (Potato witches' broom virus) was 34-tr. 1-sl./601 fields in B.C. Its highest incidence was in the central portions and the Cariboo (N.M.). Tr. amounts were seen in n. Alta. (E.C.R.).

YELLOW DWARF (Potato yellow dwarf virus) was seen in a small plot of Keswick in Simcoe Co., Ont. (H.W.W.).

HAYWIRE (? virus) was tr. in 19/91 fields inspected in n. Alta. (E.C.R.), and in 8/112 fields in s. Alta. (R.P.S.).

FROST caused some damage to tubers in the ground in the north Okanagan district of B.C. (N.M.). Spring frost was general in n. Alta. and some fields were completely killed when the tops were 6 in. high. Recovery was good with whole small seed but only about 50% in some plantings of Warba from cut seed. Little fall frost damage was experienced (E.C.R.). Early fall frosts caused some damage in Ont. District #3 (H.W.W.), and in the Guelph area all but the early dug fields were affected to some extent. Some lots in bin showed 5-10% loss (W.L.S.K.). Late harvested potatoes in the Eastern Townships of Que. and the Montreal area suffered 5-8% damage in Oct. (B.B.).

GIANT HILL was observed in a few fields of Sebago in the Dufferin, Cochrane and Nipissing districts of Ont. (H.W.W.). In N.S. it was seen in Green Mountain, Irish Cobbler and Netted Gem. Affected plants in the field appear as upright, coarse growing plants which continue to grow longer than normal. In most cases the crop in affected hills is below average and the tubers may be off type and rough (R.C.L.).

HEAT AND DROUGHT INJURY caused necrotic areas extending up to one-half inch into tubers in the Cariboo and central B.C. (N.M.).

LIGHTNING INJURY was observed in a field of Sebago at South Melville, P.E.I. Tubers in the affected patch showed a breakdown (J.E. Campbell).

SPRAIN (cause unknown) was tr. in specimens received from Quebec City, Que. (D.L.).

SECONDARY GROWTH. Low rainfall in Sask. in 1958 resulted in an early maturation of tubers. With favorable growing conditions at the end of the season many tubers sprouted producing stolons and small potatoes. The late maturing varieties Kennebec and Netted Gem were mostly affected (R.J. Ledingham).

STEM END DISCOLORATION (non-parasitic) was seen in 30 bin lots in Que. affecting 1-3% of the tubers (B.B.).

MAGNESIUM DEFICIENCY was general in potato crops in the St. John's and Bonavista Bay districts of Nfld. (O.A.O.).

Little Leaf of Potato

D.B. Robinson

A disorder of potato, commonly called 'little leaf', has been observed in a few instances in potato fields in Prince Edward Island for several years past, but has become much more serious in the 1958 crop. It has been observed chiefly in the western part of the province and mostly in the variety Sebago, although it is occasionally reported in other varieties. Of the numerous fields in which outbreaks were recorded in 1958, 11 were affected to an extent of 0.1 % or more of the crop, and in one field 8% of the plants were affected.

'Little leaf' is so named because the chief characteristic of the disorder is the smaller than normal size of the leaves of affected plants. Also the foliage of such plants is generally somewhat lustreless, the flowers are smaller and the plants are slightly shorter. The tubers are normal in appearance but quite small. Preliminary observations indicate that the number of tubers formed is not affected but that total weight may be decreased by half. It has also been found that such tubers produce plants with typical little leaf symptoms the following season. Thus, the disorder may be spread very rapidly by the use of seed from an affected crop, and especially so because many of these smaller tubers are of acceptable seed size grade.

Elimination of 'little leaf' by rogueing is difficult because many cases have been observed in which the symptoms described above are not clear cut. In some instances this may be because of uneven fertility in the field, but in many others it seems apparent that the disorder is present in varying intensity so that some plants are slightly, and others severely, affected. This difficulty in diagnosis is increased when the crop is not grown in tuber units.

PUMPKIN

POWDERY MILDEW (Erysiphe cichoracearum) was quite general in the Okangan Valley towards the end of the growing season. (G.E. Woolliams).

RADISH

WHITE RUST (Albugo candida). Mod. infection occurred on a few plants of the variety Cherry Bell in a Foundation seed plot at the University of Manitoba (W.C. McDonald).

LEAF AND POD SPOT (Alternaria ? raphani) was mod. on a few plants at Winnipeg (W.C.McD.).

SOFT ROT (Erwinia carotovora) caused sev. damage to radish packed in polythene bags at Chicoutimi, Que. (D. Leblond).

BACTERIAL LEAF SPOT (Xanthomonas vesicatoria var. raphani). A 2-acre field at Sherrington, Que. was sev. affected (R. Crête).

RHUBARB

LEAF SPOT (Ascochyta rhei) was sev. at Ste Foy and La Gorgendiere, Que. (D. Leblond).

ANTHRACNOSE (Colletotrichum erumpens). A specimen recieved from a small market garden at Sackville, N.S. showed numerous lesions on some stalks (K.A. Harrison).

RED LEAF (cause unknown). A specimen was received from Saskatoon, Sask. (T.C. Vanterpool).

SQUASH

GRAY MOLD (Botrytis cinerea). A few Buttercup squash were rotted by this organism at Kentville, N.S. (K.A. Harrison).

SCAB (Cladosporium cucumerinum) affected about 10% of the variety Green Hubbard at Hall's Harbor, N.S. Scabs were typical of those on cucumber, though deeply sunken. When diseased material was placed in a moist chamber rot did not develop but the organism fruited (K.A.H.). This is the first report to the Survey of this disease on squash (D.W.C.).

STORAGE ROT (Colletotrichum atramentarium). Isolations from a few spots on 6 stored squash yielded C. atramentarium. These squash had been grown in an area of a garden at Kentville, N.S. where Keswick potatoes, susceptible to black dot, had been grown the previous season (K.A.H.). There are no previous reports to the Survey of this disease (D.W.C.).

POWDERY MILDEW (Erysiphe cichoracearum) was frequently found in Okanagan Valley, B.C. plantings towards the close of the growing season (G.E. Woolliams).

LEAF SPOT (Septoria cucurbitacearum). Specimens were received at Ottawa from Victoria, B.C. This is the first record of this disease in B.C. (D.W.C.). Buttercup squash at Kentville, N.S. was 100% infected with many lesions by mid-Sept. but damage to the crop was negligible (K.A.H.).

SWEDE TURNIP

LEAF SPOT (Phoma lingam) was observed on swedes, broccoli and Chinese cabbage at Ste. Foy, Que. (D. Leblond).

CLUB ROOT (Plasmodiophora brassicae). Specimens were received at Ottawa from a Montreal Island market garden (V.R. Wallen). Club root occurred at St. Ubald, Que. (D. Leblond). The disease is widely distributed in N.B. in both home gardens and commercial fields. In some cases crops grown on the same land for the second successive year were 100% infected. The varieties Ditmars and Laurentian were highly susceptible and Wilhelmsburger resistant. Cruciferous weeds in fields were also affected (J.L. Howatt, S.R. Colpitts). In P.E.I. infection was favored in swedes, cabbages and broccoli by heavy rains during June and July resulting in several sustained free soil moisture periods particularly favorable to the motile infective stage of the pathogen (G.W. Ayers). Club root development in Nfld. was generally less sev. than in 1957. Infections ranged from 1% at St. John's West to 30% at Bonavista Bay (O.A. Olsen).

HOLLOW HEART (excess water) was seen at Ste Foy, Que. (D.L.).

STORAGE ROTS (Rhizoctonia solani and others). At Grand Falls, N.B. a dry rot caused 5-8% loss to swedes in a damp storage house (S.R.C.). Well developed Rhizoctonia lesions were seen on 2% of the roots of 1 lot at Grand Pre, N.S. (K.A. Harrison).

BLACK ROT (Xanthomonas campestris) affected 10-20% of the crop in several swede fields in P.E.I. Infection is believed to have originated in the stecklings on which the seed was produced. This disease may be eliminated by the hot water seed treatment but none of the seed sold locally had been so treated (G.W.A.).

SWEET CORN

RUST (Puccinia sorghi). At St. Jean, Que. most of the leaves in a 10-acre field were covered with rust pustules. Many leaves dried up and died (R. Crête). Mod. infections occurred at Ste. Foy, Que. (D. Leblond).

TOMATO

Diseases of Greenhouse Tomatoes in Essex County, Ontario in 1958

R.W. Walsh

Approximately 15 acres of greenhouse space in Essex Co., Ont. is devoted to tomato production between 1 Jan. and 15 July. From August to about 15 Dec. about 45 acres are planted to tomatoes. This report is a summary of disease conditions in the spring and fall crops respectively in 1958.

Spring Crop

Damping-off caused by Rhizoctonia sp. and Pythium sp. was common in late Feb. and early March. The increase in the incidence of this disease seemed to stem chiefly from the practice of overwatering and over feeding during a period when light intensity and temperatures were low.

Stem rot, caused by Sclerotinia sclerotiorum, that developed in a few crops was traced to inoculum carried on mulching materials. The most serious outbreak of this disease occurred at Harrow on a 4600-plant crop where sunflower seed hulls were used for mulch. Lesions usually appeared on the plant at the base of a petiole that was covered by infected hulls. More than 10% of the plants in the crop were killed before the first fruit was picked. Spread of the disease was checked by removing hulls from contact with plant stems and also by dusting or spraying with zineb. Based on the average yield and returns that the grower received from this crop, his losses from stem rot exceeded $200.00.

The few scattered light infections of early blight Alternaria solani and Septoria leaf spot, Septoria lycopersici, seen throughout the area in late April were readily controlled by spraying with maneb at 4 lb/100 gal. of water.

Gray mold, Botrytis cinerea, caused stem and fruit rot in a few crops where temperatures were too low and ventilation was inadequate. Ferbam or thiram sprays and a reduction in the relative humidity arrested the disease.

A fruit rot caused by Trichothecium roseum was found at Harrow and Leamington in early May on the Michigan-Ohio Hybrid tomato. The organism appeared to invade the fruit through the blossom end by first attacking the necrotic remnant of the style. From this point the lesion radiated uniformly through the host without seriously changing the outward conformation of the fruit. Invasion by secondary organisms often occurred resulting in a rapid breakdown of the fruit.

In the most heavily damaged crop, half of the fruit in one set was infected resulting in a loss to the grower of about $100.00. Additional heat to improve ventilation and reduce humidity controlled these outbreaks. Maneb sprays or dusts also give satisfactory control.

Several outbreaks of leaf mold, Cladosporium fulvum, appeared in late May and spread slowly until checked by increased heat and improved ventilation which reduced the relative humidity of the air surrounding the plants. The Michigan-Ohio Hybrid tomato, which constitutes over 90% of the spring crop, is not resistant to the disease.

Fusarium wilt, Fusarium oxysporum f. lycopersici, killed 5% of the plants in a small crop of tomatoes planted in unsterilized soil. This disease is present in many crops but usually only one or two plants in every 1000 show serious symptoms, and crop losses are very slight. The Michigan-Ohio Hybrid tomato is reported to have inherited resistance to this disease from one of its parents, Ohio W.R. Globe.

Tobacco mosaic virus could be found in all crops in the area but in only a few were the severe fern leaf type of symptoms evident. In only one instance was there evidence of a marked reduction in yield from the disease.

Light outbreaks of blossom end rot were seen in many crops. A more serious loss of approximately one pound of fruit per plant was experienced by a grower at Kingsville in his 2000-plant crop. This apparently resulted from an inadequate water supply in the sub soil. Examination of the soil showed that the upper 6 inches of soil had

considerable moisture but below that depth the soil was "powdery dry". Normally this grower floods his greenhouse soils to leach out excess salts but being pressed for time he did not flood the soil in this house. The crops in his adjacent greenhouses, planted on ground that had been flooded, had a good even supply of moisture in the soil and were free of blossom end rot.

M agnesium deficiency became evident in some of the more heavily laden plants just before all the fruit on the first truss had been picked. At this time the fruit load on the plants is greatest as is, apparently, the need for magnesium. The condition was corrected by spraying the foliage with a solution of one pound of magnesium sulphate in 12.5 gallons water.

Fall Crop

Light infections of late blight, Phytophthora infestans, were general in the fall crop and most were readily controlled by reducing the relative humidity and by the thorough application of maneb 4 lb./100 gal.

Leaf mold caused by Cladosporium fulvum appeared in a few crops planted to varieties not resistant to the disease. More than 95% of the fall crop in Essex County is planted to the leaf mold resistant variety Vinequeen. At Kingsville heavy leaf mold infection was found in a crop reported to be Vinequeen. Pathogenicity tests, with samples of the organism from this crop, were performed by members of the Botany Department, University of Toronto, and these failed to produce lesions on plants known to be Vinequeen.

Fusarium wilt caused by Fusarium oxysporum f. lycopersici was troublesome in more crops this year than at any other time during the past 5 years. In several crops from 5-10% of the plants were killed by this disease.

Virus diseases were of especial importance in the crop this past fall. Tobacco mosaic virus, for example, was of widespread occurrence and caused symptoms that ranged from a mild mottle to the severe fern leaf type. In one establishment an appreciable quantity of fruit was rejected because of gray wall or blotchy ripening caused by tobacco mosaic virus infections. Virus streak has destroyed up to 10% of the plants in some greenhouses.

A few growers experienced considerable crop loss from heavy infestations of root knot nematodes, Meloidogyne sp. In an 8,000-foot house nearly all plants were attacked, some of them so severely that 40% were dead by 1 Oct. The balance of the crop was abandoned.

Other

EARLY BLIGHT (Alternaria solani) was tr. in 2 plots at Lethbridge, Alta. (J.E. Moffatt). Only where inadequate protective measures were used was early blight a problem in s.w. Ont. (R.W. Walsh). Sev. infections occurred at La Gorgendiere, Que. (D. Leblond). It was widespread in N.B. but there was little damage to fruit (S.R. Colpitts). In Kings Co., N.S. early blight causes annually 25-75% defoliation. The new variety Scotia is quite susceptible. Maneb sprays, where applied, gave satisfactory control (K.A. Harrison).

GRAY MOLD (Botrytis cinerea) attacked all varieties in greenhouses at Kingston and Falmouth, N.S. Spots developed where floral parts were caught on leaves and in axils next to the stem. Stem infections developed killing 1-2% of the plants in the most sev. infected greenhouses. Infections in different houses ranged from 10-100%. Dull, rainy weather through the spring season contributed to the severity of the disease. With the return of sunny weather and the application of Thylate sprays the outbreak was checked (K.A.H.).

LEAF MOLD (Cladosporium fulvum) was observed at Saanichton, B.C. in 1 field where overhead sprinkler irrigation was used (W.R. Orchard). Specimens were received from a commercial greenhouse at Haney, B.C. Basal leaves only were attacked (H.N.W. Toms). Sev. infections on several susceptible varieties were observed at Kingston, N.S. following the dull, cold spring weather (K.A.H.).

ANTHRACNOSE (Colletotrichum spp.). In s.w. Ont. anthracnose was a problem only where sev. virus infections had limited foliage development or where protective measures were inadequate (R.W.W.). Fruit from the Leamington, Ont. area was 100% infected when examined on the market at Ottawa (D.S. MacLachlan). At Kentville, N.S. anthracnose was sev. on a crop grown on land that had borne infected crops in previous years. No infections were found on land planted to tomatoes for the first time (K.A.H.). (For a discussion of the organisms involved in the anthracnose complex in Canada see P.D.S. 37:85-86. 1957). (D.W.C.).

BACTERIAL CANKER (Corynebacterium michiganense) caused stem necrosis which killed plants throughout the season in Mersa Twp., Ont. The variety Bounty was principally involved. Mature fruit in some cases were too badly marked to be marketed and one 4-acre crop was a complete loss (R.W.W.). A sev. infection was recorded in Roberval Co., Que. (L.J. Coulombe).

FUSARIUM WILT (F. oxysporum f. lycopersici) caused sev. stunting and wilting of plants in one part of a field at Stamford, Ont. (G.C. Chamberlain.)

LATE BLIGHT (Phytophthora infestans) did not appear in the Vancouver, B.C. district until after the fruit was harvested (H.N.W.T.). Outbreaks were observed in canning crops in Essex Co., Ont. after 15 Aug. They occurred chiefly in the southern portion of the county, supporting the theory that the inoculum was wind-borne from infected areas in Ohio. None of the infected fields had received regular protective sprays (R.W.W.). It was sl. at Normandin, Que. in Aug. (L.J.C.). At Ste. Anne de la Pocatiere, Que. late blight was first observed early in Sept. and become sev. later in the month. It was reported that the tomato crop throughout Que. was seriously affected (H. Genereux). Slight infections were observed in Aug. at Gagetown and Oromocto, N.B. (S.R. Colpitts). In P.E.I. there was considerable late blight in most market and home gardens causing losses of 10-80% (J.E. Campbell). Losses were light in sprayed fields in Kings Co., N.S. One unsprayed field was defoliated by 25 Sept. and the fruit a total loss (K.A.H.). Infection was light at St. John's West, Nfld. (O.A. Olsen).

SOIL ROT (Rhizoctonia solani). Trace infections were seen at Kentville, N.S. (R.G. Ross).

SEPTORIA LEAF SPOT (S. lycopersici) was of minor importance in Essex Co., Ont. in 1958. Light infections occurred on some unsprayed crops (R.W.W.).

STEM ROT (Sclerotinia sclerotiorum). At New Minas, N.S. the high humidity under hot caps favored stem rot. About 1% of the plants were girdled at the collar and damped off (K.A.H.). Scattered infections were seen at Waterville, N.S. in a field which had previously been planted to cabbage (J.F. Hockey). The 1958 season was the worst on record for this disease in Kings Co., N.S. Most fields had at least tr. infections and several where weeds had become a problem had up to 25% of the plants infected (K.A.H.).

VERTICILLIUM WILT (V. albo-atrum) occurred generally in both field and greenhouse plantings in the Okanagan and Thompson Valleys of B.C. (G.E. Woolliams). At Ottawa, Ont. the organism was isolated from 2 mature wilted plants in a greenhouse. The vascular tissue was only slightly discolored (D.S. MacL.).

BACTERIAL SPOT (Xanthomonas vesicatoria). Six fields involving about 30 acres in the Harrow, Ont. area were infected in late July. The heavy initial infection caused sev. damage to new growth. Coalescing lesions caused necrosis of terminals while many older leaves dropped. The disease was checked by the use of copper fungicides and more favorable weather. At harvest few spotted fruits were seen (R.W.W.).

BLOTCHY RIPENING (virus). About 10% of the fruit from a 4-acre field of Moreton Hybrid near Kingsville, Ont. were affected. Many plants showed symptoms of TMV infection (R.W.W.). At Falmouth, N.S. all the fruits from the first 2 trusses in a greenhouse crop were severely affected. The foliage was badly deformed and showed virus symptoms (K.A.H.).

BROWN WALL (virus) was prevalent in several greenhouse and field crops in Essex Co., Ont. The plants bearing affected fruit were usually, but not always, infected with TMV. No virus could be detected in 60% of the plants in 1 field where the first harvested fruit showed blotchy ripening and brown wall (C.D. McKeen).

MOSAIC (virus) occurred throughout the Okanagan and Thompson Valleys of B.C. in both field and greenhouse crops (G.E.W.). In Essex Co., Ont. tobacco-etch, cucumber mosaic, and potato Y viruses were isolated from canning crops. Different types of mottle and mosaic symptoms were exhibited. A high percentage of the fall greenhouse crop was infected with TMV (C.D. McK.). A sev. infection was seen in a greenhouse at Hampstead, N.B. (S.R.C.).

PURPLE TOP (Aster yellows virus). Infection was more than 50% in an 8-acre field at Kingsville, Ont. Yield was greatly reduced (R.W.W.).

STREAK (virus) was found in a dozen or more fields in the Harrow-Leamington area and caused mod. losses. A higher than usual percentage of plants infected with TMV was observed in canning crops 2-3 weeks after field setting. Later, aphids migrated into some of these fields transmitting potato virus Y. Potato virus X was transmitted

mechanically on machinery used for cultivating, and perhaps by other means. Soon after the introduction of virus X, the second component of the streak complex, necrosis of stems and foliage developed. Shock symptoms created the impression that the crop might be totally destroyed, but a week to 10 days later affected plants began to recover. However, losses as high as 30-50% were seen (C.D. McK.).

BLOSSOM-END ROT (physiological) was troublesome in Sask. in 1958. Weather conditions were favorable to the disorder (R.J. Ledingham). An affected field at Gosfield South, Ont. had very low calcium levels and a pH of 4.6. After the application of 300 lb./acre of calcium nitrate with irrigation and foliar sprays of 12 lb. calcium nitrate/100 gal. the crop improved greatly and no further incidence of blossom-end rot was seen (R.W.W.). At St. Catharines, Ont. much of the early fruit of both staked and field tomatoes was affected (G.C. Chamberlain). Early ripening fruit of Scotia was affected in a number of fields in Kings Co., N.S. (K.A.H.).

CATFACE. This condition was general throughout Essex Co., Ont. especially on the varieties Clark Special and Camdown. Some fields of the latter variety had 15-20% of the fruit affected (R.W.W.).

CHEMICAL INJURY. Foliage on 5 acres of canning tomatoes in Colchester South, Ont. was moderately burned by the application of liquid fertilizer. Six acres of newly planted tomatoes at Dresden, Ont. were sev. damaged by drift from a 2,4-D and 2,4,5-T spray applied to the roadside. The field was disced under. Several other fields in Essex and Kent counties were injured by drift from herbicidal chemicals (R.W.W.).

FROST. The latest spring frost on record injured tomato plants in Kings Co., N.S. Killing frosts during the first 10 days of June caused considerable damage to tomatoes and other plants. Early fall frosts also killed tomato crops before the maturation of the fruit (J.L. Howatt). Immediate damage was sev. but all but about 10% of the plants recovered and produced a late crop (K.A.H.).

GROWTH CRACKS. Ripe fruit was mod. affected following showery weather at Oromocto, N.B. (S.R.C.).

LIGHTENING INJURY. A field near Kingsville, Ont. had the plants killed in an area about 50 ft. in diameter (R.W.W.).

MAGNESIUM DEFICIENCY. Sev. magnesium deficiency symptoms were seen in a half-acre section of a 5-acre field in Essex Co., Ont. Foliar applications of Mg SO4 corrected the condition (R.W.W.).