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CANADIAN PLANT DISEASE SURVEY

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RESEARCH BRANCH CANADA DEPARTMENT OF AGRICULTURE

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CONTENTS

"The Canadian Plant Disease Survey is a periodical of information and record on the occurrence and severity of plant diseases in Canada. It will also accept other original information such as the development of methods of investigation and control, including the evaluation of new materials. Review papers and compilations of practical value to phytopathologists will be included from time to time. It will not accept results of original research suitable for publication in more formal scientific journals".

NEW AND NOTEWORTHY DISEASES

Leaf rust of wheat (Puccinia recondita) was severe in much of the wheat growing area of Western Canada. Losses in susceptible varieties and in late maturing 'Selkirk' were estimated at 20 percent. Race 15 constituted 90 percent of the isolates in the Prairie Provinces. The resistance to stem rust (P. graminis f. sp. tritici) possessed by the predominant wheat varieties grown in the west again prevented widespread and severe losses. Susceptible varieties were severely attacked in both Eastern and Western Canada. Oat stem rust (P. g. f. sp. avenae) caused losses in late fields in Manitoba. Race C10 continued to increase in the west and race C9 predominated in Ontario and Quebec. Both can attack all commercial oat varieties. Races of crown rust (P. coronata) virulent on 'Landhafer' and 'Santa Fe' made up more than half the population in Western Canada in 1965.

Common root rot (Bipolaris sorokiniana, Fusarium spp.) was less severe in both wheat and barley than in 1964. Some browning root rot (Pythium graminicola) of wheat occurred in Alberta. Late maturing wheat crops in Ontario were heavily infected with powdery mildew (Erysiphe graminis). Take-all (Gaeumannomyces graminis) caused some damage to wheat in Alberta and Saskatchewan. Speckled leaf blotch (Septoria avenae f. sp. triticea) and glume blotch (S. nodorum) of wheat were generally distributed throughout Saskatchewan. Speckled leaf blotch of oats (S. avenae f. sp. avenae) and of barley (S. passerinii) were common and sometimes severe in Ontario and Manitoba respectively.

Leaf blotch (Drechslera avenacea) of oats caused damage in Newfoundland and barley was affected by spot blotch (Bipolaris sorokiniana) throughout Manitoba. Few barley fields in north and central Alberta were free of net blotch (Pyrenophora teres) and scald (Rhynchosporium secalis).

Loose smut (Ustilago tritici) was common in durum wheats in Saskatchewan and Manitoba and loose smut of barley (U. nuda) was sometimes severe in north and central Alberta. Stem smut of rye (Urocystis occulata), rarely encountered in Canada, was seen in south Alberta. Considerable amounts of bacterial black chaff (Xanthomonas translucens) occurred in wheat fields in central Alberta. Some late crops of oats and barley in Western Canada were severely infected with barley yellow dwarf virus. A previously unrecognized, mechanically transmissible virus disease of oats caused stunting, blasting of florets and foliar necrosis in oats in Manitoba.

Alsike clover in eastern Quebec suffered damage from root rot caused by species of Fusarium and crown rot (Sclerotinia trifoliorum) caused heavy losses in clovers in Prince Edward Island. Bean yellow mosaic virus and pea streak virus were found to be widely distributed in red clover in Alberta.

Pasmo (Septoria linicola) caused heavy losses in flax in localized areas of Manitoba and stem rot (Sclerotinia sclerotiorum) was prevalent and destructive in rape fields in the same province. The oat-cyst nematode (Heterodera avenae) caused appreciable damage in some corn fields in west-central Ontario. This appears to be a new host record for North America. Black root rot (Thielaviopsis basicola) was responsible for considerable losses in flue-cured and burley tobacco fields in Ontario. Tobacco veinal necrosis virus was found, for the first time in Canada, in southwestern Ontario.

Root rots, caused by species of Fusarium and Rhizoctonia solani, were responsible for losses in snap bean crops in British Columbia and in field beans in western Ontario. The Ontario crop was further reduced by a high incidence of wilt and stem rot (Sclerotinia sclerotiorum). Bacterial blights, caused mainly by Xanthomonas phaseoli var. fuscans, were found in half the bean fields surveyed in Ontario. Broccoli crops in British Columbia and New Brunswick were affected by boron deficiency.

Losses in cabbage crops from bottom rot (Rhizoctonia solani) were high in some parts of Nova Scotia. Unsprayed celery in Nova Scotia was severely damaged by leaf spot (Cercospora apiicola). Cucumber crops suffered heavy damage from leaf spot (Alternaria cucumerina) in British Columbia and Nova Scotia and from scab (Cladosporium cucumerinum) throughout Eastern Canada. Mosaic was prevalent on cucumbers in western Ontario and in Quebec. Neck rot (Botrytis allii) caused losses in stored onions in British Columbia, Quebec and Nova Scotia and fusarium basal rot (Fusarium oxysporum f. cepae) was responsible for heavy losses in spring planted onions in the British Columbia interior. The area of infestation by white rot (Sclerotium cepivorum) in Quebec was greatly extended.

Wilt (Verticillium dahliae) continued to be a problem on eggplant, pepper and tomato in the British Columbia interior and in western Ontario. The rutabaga cultivar 'York' proved highly resistant to club root (Plasmodiophora brassicae) in Quebec and the Maritime Provinces. Losses from downy mildew

(Peronospora farinosa) were heavy in spinach crops in British Columbia. Early blight (Alternaria solani) of tomato was a problem in British Columbia, Quebec and the Maritime Provinces and gray mold (Botrytis cinerea) was more prevalent than usual in fall greenhouse crops in western Ontario. Leaf mold (Cladosporium fulvum) has become serious, since the introduction of susceptible cultivars, in greenhouse tomato crops in Ontario and Nova Scotia. Losses from tomato bacterial canker (Corynebacterium michiganense) were heavier than in 20 years in Ontario greenhouses. Injury from manganese toxicity was frequently encountered in tomato crops in western Ontario.

Bacterial ring rot of potatoes (Corynebacterium sepedonicum) increased in incidence in Prince Edward Island and was widespread and destructive in Newfoundland whereas the incidence of blackleg (Erwinia atroseptica) decreased in most areas. The golden nematode (Heterodera rostochiensis) was found infesting about 100 acres of potato land on Vancouver Island, British Columbia. None was found on the mainland. Leak (Pythium ultimum) caused some losses in Quebec and Prince Edward Island. Losses from wart (Synchytrium endobioticum) were unusually high in Newfoundland.

Superficial molds, mainly Alternaria spp. and Aureobasidium pullulans caused losses through reduction in grade in stored apples in British Columbia and Quebec. Perennial canker (Neofabraea perennans) caused more than the usual amount of damage in British Columbia orchards but scab (Venturia inaequalis) caused no significant losses in any of the major apple producing districts in Canada. Low spring temperatures in British Columbia, Ontario and the Maritime Provinces were responsible for apple fruit deformities. The infestation of trellis rust (Gymnosporangium fuscum) of pears on the mainland of British Columbia appears to have been eradicated.

Bacterial canker (Pseudomonas mors-prunorum) of stone fruits was found, for the first time in North America, on sweet cherry trees in Nova Scotia. Necrotic ring spot virus continues to spread rapidly in sour cherry orchards in Ontario. Both crown and cane galls (Agrobacterium tumefaciens and A. rubi) increased in severity in highbush blueberry crops in British Columbia and crown gall was occasionally severe in British Columbia vineyards. Roesleria hypogaea was reported, for the first time in Canada, as the cause of a stem and root girdling of grapevines in Ontario. Fanleaf virus occurred in grapes in both British Columbia and Ontario.

Ascochyta chrysanthemi and Pectobacterium carotovorum f. sp. chrysanthemi were recognized as causing damage in chrysanthemum propagating beds in Ontario. Both are new to Canada. Curvularia trifolii f. sp. gladioli was responsible for heavy losses in some gladiolus plantings in western Ontario.

Blight (Endothia parasitica) was severe on sweet chestnut trees in western Ontario. Needle blight (Dothiostroma pini) damaged exotic pine species on Vancouver Island, British Columbia and brown spot needle blight (Scirrhia acicicola) was severe on pines in Manitoba. Anthracnose (Gloeosporium nervisequum) caused heavy defoliation of sycamore trees on Vancouver Island. Canker (Septoria musiva) was widespread on poplars in Alberta. Willow blight (Pollacia saliciperda) continues to be severe in many parts of the Maritime Provinces. Canker (Leucostoma massariana) was reported, for the first time in Canada, on mountain ash from Quebec. Phytophthora citricola caused a shoot blight of lilacs in Alberta. The known distribution of Dutch elm disease was extended in both Ontario and New Brunswick.

THE WEATHER AND ITS INFLUENCE ON PLANT DISEASE

H. N. W. Toms reports that temperatures fell suddenly to an unusual 0°F accompanied by 30 mph winds in mid-December, 1964 in some districts on the British Columbia coast and in the lower Fraser valley. Snow fell early and the total recorded fall for December was 35 inches compared to the normal average of 3.3 inches. As much as 35 inches of snow had accumulated by the end of January in the coastal area.

These low temperatures in December were responsible for heavy losses in strawberry fields and a large acreage had to be replanted. Raspberry plantings also suffered some damage. Forage crops such as the ryegrasses, ladino clover and, to a lesser extent, red clover suffered damage. Damage was severe to many ornamental shrubs and cherry laurel hedges, many species of cotoneaster and climbing roses were killed to the ground. Fruit trees in home gardens were severely affected and over 600 acres of sugar beet stecklings were killed outright.

Spring was drier than usual and by May nearly ideal conditions prevailed for land preparation and seeding. The last general frost occurred early in May though a late frost in June damaged fruit of some highbush blueberry cultivars in low-lying peat bogs.

The growing months, May to August, were remarkable for the amount of sunshine and for the high mean monthly temperatures in July and August. The 1965 season was notable for the absence or extremely low incidence of diseases such as early and late blight of potato and tomato, gray mold and sclerotinia blight of pole beans and downy mildews of onion and canning peas, all diseases typical of the wet, cool growing season of 1964. With the exception of clubroot of crucifers and sclerotinia drop of early-planted lettuce, the diseases observed during the summer of 1965 were of minor economic importance.

The relatively dry summer favored the occurrence of root rots in shallow-rooted crops. The combination of winter damage and low moisture availability produced premature senility in older portions of ornamental and native conifers. The first killing frost in the inland areas was recorded on 29 September but no heavy frost had occurred in the coastal area by the beginning of November.

According to M. F. Welsh the two most significant weather experiences of the year in the Okanagan and neighboring valleys of British Columbia were a sudden drop to subzero temperatures in mid-December, 1964, and a sharp temperature drop in late March. Strong north winds on December 15 rapidly dropped temperatures nearly 40 degrees to subzero levels with an ultimate minimum of -15°F at Summerland on the 16th. These were the first subzero temperatures ever recorded in December and the wind chill factor reached -53°F in more exposed locations.

This combined experience resulted in the killing of many fruit trees with the heaviest losses occurring in peaches but also considerable killing or injury in cherry, and lower losses in pear, apricot and the more tender varieties of apple. There were no commercial peach or apricot crops in 1965; other stone fruits and 'Bartlett' pears bore commercial crops only in favored locations in the southernmost districts. The apple crop was reduced by several million bushels. Tree damage and crop reduction were most severe on the north sides of trees in exposed locations.

All tree injury has been attributed to the December experience. There was evidence that much of the crop loss resulted from the effect of spring frosts on trees already weakened in December. Apple fruits suffered several types of deformation that appeared to be the direct result of spring frost injury and an assortment of breakdown conditions that have been assessed as secondary results of the December low temperature injury to trees. Many roses and other ornamentals exposed to north winds were severely injured or killed. In the Kootenay valleys the December temperature drop was less serious.

The loss of vines in Okanagan Valley vineyards was low, except for those planted in 1964. Many mature vines were killed to ground level but, as almost all plantings are self-rooted, they were renewed by growth from the uninjured roots. 1965 crops were eliminated or seriously reduced, the extent varying with the variety and location.

The incidence of several diseases was influenced by the winter experience of the trees. Weakened apple bark tissue proved to be unusually susceptible to invasion by Gloeosporium perennans so that canker extension was much greater than normal. The incidence of powdery mildew was much lower than in the last few years although the depression of this disease was not as great as in 1950 and 1956 following previous severe winters. The complete loss of peach and apricot crops and the loss of cherry crops in most districts provided no opportunity for the occurrence of brown rot and rhizopus rot. There is some hope that the increase in brown rot incidence evident in the last several years may be arrested by the lack of overwintering mummies. The vigorous replacement growth from the roots of winter injured grape vines displayed unusually distinct symptoms of fanleaf and other virus diseases.

February and March were unusually dry, with only 0.33 inches of rain. Two brief but heavy rains in April induced a high incidence of peach leaf curl. There were several extended wet periods in May and June and inadequately sprayed apple orchards developed varying amounts of early season foliage and fruit scab. These rains also permitted moderate fire blight levels on pear to be maintained in the two districts where the disease had occurred in 1964 but other districts remained relatively free.

Fruit symptoms of McIntosh pucker were generally moderate but were severe at Summerland; those of Newtown ring russeting were very mild at Summerland and moderate to severe in southern districts. Examination of blossoming dates for the two varieties, in the two areas, discloses that the six days following full bloom of the mildly-affected 'Newtown' at Summerland provided over 1400 heat units whereas full bloom of the more severely-affected 'McIntosh' at Summerland and 'Newtown' in southern districts was followed by a 6-day period providing only 350 heat units.

Summer conditions were excellent for field tomatoes, but a mid-September frost in northern districts shortened the cropping season. A hailstorm in mid-August injured many fruits and is believed to have increased incidence of rots by providing entry points for the causal fungi.

L. J. Piening reports that the spring and early summer in central Alberta were cool and wet, probably facilitating the infection of cereal plants by fungal and bacterial plant pathogens. The weather was warmer in mid-July and encouraged the development of abundant vegetative growth providing ample infection courts and favorable microclimates for considerable disease development. According to J. B. Lebeau, similar early-season conditions prevailed in southern Alberta. Daily sunshine in June averaged only 7.72 hours at Lethbridge and the mean maximum temperature was 68.8°F. These conditions favored the development of foliage diseases, particularly on cereals.

B. J. Sallans reports from Saskatoon that moisture conditions were generally favorable for seeding cereal crops in Saskatchewan during early May despite below-normal rainfall in western and northern crop areas. By mid-May 35% of the wheat and 15% of the coarse grains were seeded. Snow and rain then delayed seeding particularly in the southern and east central districts. However, by 1 June some 90% of the wheat and 60% of the coarse grains had been seeded. Several degrees of frost occurred on a number of nights during May but little significant injury occurred as most seeded grains had not emerged.

Spring rains continued well above normal throughout June and by 13 July all crop districts had excellent moisture conditions. Cool weather following late seeding, however, delayed development some 10 days later than usual. Leaf rust became epidemic on most bread wheats during a period of frequent though generally light rains. A period of high temperatures then hastened maturity; bread wheats were largely defoliated by leaf rust and some areas suffered considerable crop damage due to heat and insufficient moisture. Prospects were still good on 9 Aug. for an estimated average wheat crop of 28 bushels per acre.

Swathing of crops was general by the end of August when heavy to light rains halted harvesting operations. Rain and snow continued at intervals through most of September and harvesting was not resumed until about the end of the month. The wet weather resulted in an estimated loss of 8% of the crop and the quality of wheat was reduced by 1-3 grades. Some frost damage occurred in the late-maturing cereal crops.

In addition to widespread occurrence of and damage by leaf rust of wheat, stem rust was severe on susceptible durum varieties and caused appreciable injury to late fields of 'Thatcher'. The moist growing season favored speckled leaf blotch (Septoria spp.) of wheat and barley and glume blotch (Septoria nodorum) of wheat. Net blotch (Pyrenophora teres) was also fairly common on barley. Common root rot of cereals was not suppressed as much as usual by wet weather. Ergot was more common in wheat than normal although infections were not usually more than trace amounts.

According to W. J. Cherewick, temperatures in Manitoba were near normal in May and June but heavy rains delayed seeding considerably. Crops seeded before the wet weather matured about four weeks earlier than those seeded later. Leaf rust of wheat and stem and crown rusts of oats were severe on the later-sown cereals. Lack of snow cover in the early winter of 1964 appeared to have reduced the populations of overwintering stages of the six-spotted leafhopper and wet weather in the spring of 1965 further hindered a build-up. Consequently, transmission of aster yellows by local sources of leafhoppers was minimal and the incidence of the disease was light in 1965. Cold, rainy weather in early September prevented harvesting of cereals and much of the crop lay in the swath for about two weeks. Seed discoloration by species of Alternaria and other organisms was severe in samples of weathered grain.

The growing season in southwestern Ontario, as reported by C. D. McKeen, was characterized as being cool over the entire period. Abnormally low night temperatures were recorded several times in June, July, August and September. In much of southwestern Ontario precipitation was extremely light until the end of July. Normal to above-normal precipitation was reported for many areas in August and September with more than the usual amount of overcast skies and high humidities for much of the period.

The cool dry weather in June and July induced a high incidence of fusarium root rot in dry beans in Kent, Lambton and Huron counties. Late season rains and high humidities led to considerable infec-

tion by Sclerotinia sclerotiorum in white bean fields in the same counties. The cloudy, humid conditions favored outbreaks of botrytis stem mold in many fall greenhouse tomato crops in Essex County.

Winter killing caused severe damage to forage legumes and to strawberry plantings in the Lower St. Lawrence area of Quebec, according to H. Généreux. The crop season was delayed due to cold soil conditions and wet weather between 8 and 23 May. Dry weather prevailed in June and July and soil moisture content was 50% lower than normal from 20 June to the end of July. These conditions were not favorable for the initiation of apple scab and orchards were also free from fire blight and rust. Leaf spots of forage legumes were at a low level of incidence. Green petal of strawberry and clover phyllody were virtually absent in the area and in the Lake St. John district.

Conditions in August and September were not favorable for late blight development. Traces only were observed on potato foliage in Kamouraska and Témiscouata counties at the beginning of September. Elsewhere in the province the disease was observed in August and September in a few scattered fields. Striking symptoms of bacterial ring rot were evident on foliage and tubers. A frost in late September and a severe one in early October arrested late blight development but also caused severe damage to the potato crop.

Excessively cold weather in February and March with little snow cover in New Brunswick resulted in severe winter killing in strawberry and raspberry plantings, according to S. R. Colpitts. Cool weather prevailed through May to early July and extended the bloom period of apples and strawberries. Rainfall was well spaced and the first apple scab ascospore discharge was on 12 May with scab first found in early June. The disease did not develop extensively and scab was not a problem in 1965.

July and August were extremely dry except in the northern areas. Rainfall was about one-half of the 10-year average in most southern districts. Yields of most crops were greatly reduced but diseases, as a rule, were not serious. Fruit size in apples was greatly reduced and symptoms of deficiency of magnesium and possibly of zinc were evident. There was an early dropping of fruit in September; the crop was further reduced by early fall frosts. Temperatures fell as low as 14°F on 7 October and apples in storage later showed severe browning as a result of the frost.

Some gray mold rot developed in irrigated strawberry plantings but where irrigation was not used the severe drought reduced the picking season to 10 to 14 days and rots were not a problem. Leaf spots, usually serious in some strawberry varieties, were of no importance in 1965. Beans for processing were severely affected by gray mold in the northern areas. Showery, cool weather in August made cucumber scab a serious problem in all parts of the province.

Late blight, for the second successive year, was virtually absent. Although adequate rainfall for an epidemic was recorded in the northern potato growing area, cool temperatures prevented outbreaks. Excessive drought in the southern districts was a factor in controlling the disease. Early blight was serious on tomato but of minor importance on potato.

R. G. Ross reports that although the winter of 1964-65 did not seem severe there was serious winter killing of peach trees in Nova Scotia and most peach orchards failed to set fruit. Raspberries wintered well and good yields were obtained when irrigation was used. New canes did not grow as well as normal but they were relatively free of cane disease.

Average temperatures during April and May were below normal and the development of apple scab perithecia and apple buds were retarded. No ascospores could be found in perithecia examined on 22 April and only a few colored ascospores were present on 4 May. The first spore discharge was recorded on 10 May and the first infection period was on 18 May. Apple buds developed very slowly with bloom about a week later than normal. Warm weather beginning on 6 June brought all varieties into bloom at about the same time. About ten infection periods occurred during the spray season but the remainder of the growing season was relatively free of infection periods so that there was little significant spread of scab. Growers, with few exceptions, had no difficulty in obtaining complete control of apple and pear scab. The apple crop, following an excellent bloom and set, suffered from below-normal rainfall and fruit were small in many orchards.

Rainfall from May to September at Kentville was 9.83 inches as compared with a 50-year average of 15.17 inches although June rainfall was normal giving crops a good start. This lack of total rainfall along with above-normal hours of sunshine and a high evaporation rate affected the development and spread of diseases on all crops. Diseases dependent on rainfall for distribution and high humidity for infection were absent or present in small amounts only; powdery mildews were active. Late blight of potatoes was not found in any of the main potato-growing areas either in cull piles or in the growing crop. There was a 10-day period in August that provided conditions favorable for late blight but low humidity returned before blight could develop. One specimen only, from Cape Breton, was seen.

As in the other Maritime Provinces, abnormally low rainfall characterized the growing season in Prince Edward Island, according to G. W. Ayers. Precipitation from June to September inclusive was the lowest on record. Under the conditions of low rainfall and humidity foliar diseases developed little, if at all, though powdery mildews were prevalent on forage legumes and ornamentals. Only a trace of late blight was present in potato fields and unsprayed tomatoes remained blight-free until harvest. Crops were little affected by diseases although they suffered yield reductions due to the lack of rainfall.

DISEASES OF CEREAL CROPS

WHEAT

HEAD DISCOLORATION (Alternaria spp.) was observed in 8/11 fields examined. Severity was variable between and within fields. The maximum severity observed was 96% of the heads bearing a trace to 30% of the glume area discolored. Specimens received of grain weathered because of delayed harvest showed a high incidence of infection by Alternaria spp. (W. A. F. H.). *

LEAF SPOT (Ascochyta sorghi). Trace amounts were observed in 2 fields in s. Sask. Specimens were received from Yorkton and Melfort (R. D. T.).

SPOT BLOTCH (Bipolaris sorokiniana) was sl. in 1/228 fields in Sask. The infection was in the s. e. part of the province (R. D. T.).

COMMON ROOT ROT (Bipolaris sorokiniana, Fusarium spp.). Damage was extensive on 'Winalta' winter wheat at Vulcan; specimens were also received from Kinsella, Bruce, St. Paul and Granum in n. Alta. (A. W. H.). It was rated 5-tr. 2-sl./24 spring wheat and 1-sl./8 winter wheat fields in s. Alta. (J. S. H., T. G. A.). Field surveys indicated that common root rot was somewhat less severe in Sask. than in 1964, the average rating being 10.4 compared with 13.5. The 1965 ratings for crop districts 1 to 9 were, respectively: 9.6, 10.4, 13.9, 12.1, 9.1, 12.1, 9.0, 8.9 and 8.9. (B. J. S.). It was rated 1-tr. 4-sl./8 fields examined nr. St. Catharines, Ont. (T. R. D.).

ERGOT (Claviceps purpurea). Trace amounts were recorded in c. Alta. (L. J. P.) and it was rated 1-tr./24 spring wheat fields in s. Alta. (J. S. H., T. G. A.). Ergot was widely distributed throughout Sask. although it was not serious. Ratings were 34-tr. 2-sl./211 fields examined (R. D. T.).

ANTHRACNOSE (Colletotrichum graminicola). Specimens were received from Vulcan and High Prairie, Alta. (A. W. H.).

GLUME SPOT (Epicoccum nigrum). This saprophyte was isolated in s. Alta. from glumes and kernels of 3 samples of spring wheat that exhibited considerable sterility. The organism was determined by Mary E. Elliott, Plant Research Institute, Ottawa (T. G. A.).

POWDERY MILDEW (Erysiphe graminis). 'Gaines' fall wheat was 50% infected and damage was moderate in a 1-acre plot at Abbotsford, B. C. Infection was present on leaves and heads and even on beard hairs. Nearby 'Ridit' wheat was not infected (H. N. W. T.). Trace amounts only were recorded in c. Alta. (L. J. P.) while infection ratings in s. Alta. were 2-sev./24 spring wheat and 1-sev./8 winter wheat fields (J. S. H., T. G. A.). It was rated 2-tr./8 fields nr. St. Catharines, Ont. (T. R. D.). Infections were moderate at Harrow and mod.-sev. on late-maturing crops at Ridgetown, Guelph and Ottawa, Ont. (R. V. C.).

MOLDY GRAIN (Fusarium spp.). Wheat seed received from Wolseley, Sask. was bright red in color due to growth of Fusarium spp. during storage under damp conditions (R.D.T.).

TAKE-ALL (Ophiobolus graminis) caused extensive damage at Rich Lake and was reported from Beauvallon, Alta. (A. W. H.). It was observed in a few fields north and east of Lacombe (L. J. P.) and was 1-mod. 1-sev./8 winter wheat fields surveyed in s. Alta. (J. S. H., T. G. A.). Slight infection occurred in plots at Regina, Sask. where stubble from a previous crop of grass was present. A specimen was also received from Tisdale (B. J. S.). It has been pointed out (Trans. Brit. Mycol. Soc. 35: 29-33, 1952) that the proper binomial for this fungus is Gaeumannomyces graminis (Sacc.) v. Arx & Oliver (D. W. Creelman).

BASAL GLUME ROT (Pseudomonas atrofaciens) was severe in 1 field and trace in 2 in s. Sask. (R.D.T.).

STEM RUST (Puccinia graminis). Damage was severe on 'Garnet' at St. Paul. It was also recorded on 'Garnet' at Legal, 'Canthatch' at Brooks and Clandonald, winter wheat at Edmonton and hybrid wheat at Edmonton and Ranfurley, Alta. (A. W. H.). It occurred in two-thirds of the fields examined north and east of Edmonton with $\frac{1}{2}$ of these fields scoring severe. It was seen on 'Garnet', 'Cypress', 'Chinook', 'Thatcher' and 'Red Bobs' at the Lacombe Experimental Farm and was severe in the Ashmont, Alta. area (L. J. P.). Stem rust was rated 2-tr. 1-sev./24 spring wheat and 1-tr./8 winter wheat fields in s. Alta. (J. S. H., T. G. A.). Ratings were 80-tr. 32-sl. 14-mod. 6-sev./193 fields surveyed in Sask. Of the 6 severely infected fields, 3 were seeded to 'Lee'. Durum wheats were rated 4-tr. 1-mod. 6-sev./14.

* see Appendix "A" for list of contributors, their addresses and affiliation.

'Pelissier' and other susceptible varieties were severely affected in s.w. Sask. (B. J. S.). Infections were rated 1-tr. 1-sl. 1-mod./8 fields examined nr. St. Catharines, Ont. (T.R.D.) and was severe on susceptible varieties at Harrow. Stem rust appears to be a serious problem in w. Ont. since reports indicate the presence of new races for which resistance is not available. Infections were heavy at Guelph, Ridgetown and Ottawa, Ont. (R. V. C.).

LEAF RUST (Puccinia recondita). Infection was extensive at Athabaska and at St. Paul, Alta. on 'Garnet'. It was also reported from Winterburn, Vulcan and Clandonald (A. W. H.). Leaf rust was the major disease problem on wheat in c. Alta. where it occurred in severe proportions in 90% of the fields surveyed (L. J. P.). Ratings in s. Alta. were 2-tr. 1-sl. 9-mod. 3-sev./24 spring wheat and 1-tr./8 winter wheat fields. Infection was light on most late-maturing spring wheat crops but was heavy in a few fields of 'Red Bobs', 'Garnet' and soft white spring wheat (J. S. H., T. G. A.). Leaf rust in Sask. was generally present in slight amounts by 15 July. By 31 July infections were mod.-sev. and by 9 August a large proportion of the fields were defoliated. Fields surveyed 9-24 August were rated 7-sl. 38-mod. 142-sev./187. Ratings on durum wheat were 2-tr. 1-mod./15 (B. J. S.). Traces of leaf rust were present in Man. by 14 July and by 3 Aug. infection ranged as high as 100% on the flag leaves in c. Man. (W. A. F. H.). It was rated 2-tr./8 fields surveyed nr. St. Catharines, Ont. (T. R. D.). Moderate to severe infections were recorded at Harrow, Guelph, Ridgetown and Ottawa, Ont., especially on late crops (R. V. C.).

STRIPE RUST (Puccinia striiformis). Infections were rated 1-tr. 1-sev./24 spring wheat and 1-tr./8 winter wheat fields in s. Alta. (J. S. H., T. G. A.).

BROWNING ROOT ROT (Pythium graminicola). Specimens were received from Standard and Brownvale, Alta. where the disease was reported to be prevalent (A. W. H.). Specimens were also received from Leader, Sask. (R. D. T.).

SPECKLED LEAF BLOTCH (Septoria avenae f. sp. triticea). Trace amounts were observed in c. Alta. (L. J. P.). The disease was generally distributed throughout Sask. and was rated 2-tr. 10-sl. 8-mod./198 fields surveyed. Specimens were also received from Swift Current and Melfort (R. D. T.). Moderate infections were seen at Harrow and Ridgetown, Ont. (R. V. C.).

GLUME BLOTCH (Septoria nodorum) was observed at Athabaska, Bawlf, Grand Prairie, High Prairie, La Crete, St. Paul, Vegreville, Vulcan and Wetaskiwin, Alta. It was severe on 'Park' wheat at Wetaskiwin (A. W. H.). It was widely distributed in Sask. Infections were rated 19-tr. 24-sl. 9-mod./207 fields surveyed. Specimens were received from Canora, Davidson, Hudson Bay, Norquay and Paddockwood (R. D. T.). Infections were trace to slight at Harrow and Ridgetown, Ont. (R. V. C.).

LOOSE SMUT (Ustilago tritici). Five percent of the heads of 'Canthatch' wheat were smutted at Willingdon, Alta. (A. W. H.). It was found in Sask. only in durum wheats and in the bread wheat 'Lee'. Infections in durum were rated 3-tr./16 fields and in 'Lee' 2-sl./4. No infections were seen in 190 fields of other bread wheats (B. J. S.). In a survey of 77 fields in Sask. a 4% infection was seen in 1 field of 'Lee' and 1 infected head in each of 4 fields of the varieties 'Pembina' or 'Selkirk'. Of durum fields examined, 8/10 showed infection ranging from tr.-5% with the mean at 1.7%. In Man., 5/47 fields of bread wheat showed infection. Two fields of 'Lee' had 2 and 5% smutted heads and 3 fields of 'Pembina' or 'Selkirk' had 1 smutted head each. Infections in durum in Man. ranged from tr.-6% with the mean at 1.2% in 16/22 fields (J. J. N.). In another Man. survey of 14 fields, 1 field with 'Lee' as an admixture had 6% infection (W. A. F. H.). It was rated 1-tr./8 fields surveyed nr. St. Catharines, Ont. (T. R. D.).

BACTERIAL BLACK CHAFF (Xanthomonas translucens) was reported from Brightview, Clandonald, Elk Point, Ponoka, St. Paul, Stettler, Waskatenan and Westlock, Alta. (A. W. H.). Considerable amounts were observed in the Lacombe and Ponoka areas of Alta. (L. J. P.). A trace infection was seen in 1 field in s.w. Sask. (B. J. S.). The organism was isolated from leaf samples of 'Manitou' wheat from 2 farms at Domain, Man. and from heads of the durum line 'D. T. 184' from Regina, Sask. All isolates were pathogenic to wheat seedlings (W.A.F.H.).

BARLEY YELLOW DWARF (barley yellow dwarf virus). Trace infections were found in 7/10 fields examined in Man. and e. Sask. (C. C. G.).

WHEAT STREAK MOSAIC (wheat streak mosaic virus). It was rated 2-mod. 4-sev./24 spring wheat and 1-sl./8 winter wheat fields surveyed in s. Alta. (J. S. H., T. G. A.). Severe damage in s. Alta. occurred only in spring wheat and was restricted to the Warner-Skiff-New Dayton area s.e. of Lethbridge. Inoculum almost invariably originated in overwintered volunteer winter wheat (T. G. A.).

WHEAT STRIATE MOSAIC (wheat striate mosaic virus) was observed as a trace in 1 field nr. Morden, Man. No infection was found in 17 other fields examined in Man. and e. Sask. (C. C. G.).

LEAF BLOTCH (physiological). A previously unreported leaf blotch occurred on 'Winalta' but not on other commercial varieties of winter wheat throughout the winter wheat area of s. Alta. The bleached, necrotic blotches were most prevalent and extensive on that portion of the blade exposed to the direct rays of the sun. Damage was confined to the flag leaf and attempts to isolate a causal organism failed. Weather records before and at the time of the appearance of the condition suggest that it may have an etiology similar to that reported for a non-parasitic spot of oats (Plant Disease Reptr. 43: 337-342. 1950) (T. G. A., M. N. G.).

SPLOTCH (physiological). Damage was sl. in 1/24 spring wheat fields surveyed in s. Alta. (J.S.H., T. G. A.). It was rated 3-sl. 1-mod./16 fields of durum examined in s. w. Sask. (R. D. T.).

CHEMICAL INJURY (2,4-D injury). Slight to severe stunting, ragged growth and death of some plants were observed in several fields in s. w. Sask. These had been sprayed with mixtures of herbicides and earlier or later than the recommended time (R. D. T., B. J. S.).

WINTER KILLING was rated 4-tr. 6-mod. 7-sev./17 winter wheat fields surveyed in Alta. (J.B.L.).

OATS

LEAF BLOTCH (Drechslera avenacea) was prevalent in a seedling stand on sandy soil at Willingdon and specimens were received from Ponoka, Alta. (A. W. H.). Trace to slight infections were observed in the Lacombe, Alta. district (L. J. P.). It was moderate to severe on 'Fundy' oats on the Experimental Farm, St. John's West, Nfld. (G. A. N.).

POWDERY MILDEW (Erysiphe graminis). Infections were rated 1-tr. 1-sl./4 fields surveyed nr. St. Catharines, Ont. (T. R. D.).

ROOT ROT (Fusarium graminearum). Ten-20% infection caused slight to moderate damage in Queens Co., P. E. I. in 2 fields that were particularly low in fertility and were seeded deeply (C. B. W.).

OAT-CYST NEMATODE (Heterodera avenae). Heavy infestations were recorded in 2 fields nr. Bowmanville, 2 nr. Stoufville, 2 nr. Clinton, 1 nr. Uxbridge and 1 near. Mount Forest, Ont. (S. G. F.).

HALO BLIGHT (Pseudomonas coronofaciens) was noticeable in experimental plots at Lacombe, Alta. but little was seen in farmers' fields (L. J. P.). Slight infections were observed in 3/22 fields surveyed in Sask. (R. D. T.). Trace infections of the non-toxin type were seen in 2/6 fields observed in Man. Natural infections in experimental plots involved as much as 50% of the leaf area (W. A. F. H.). It was rated 1-tr. 1-sl. 1-mod./4 fields surveyed nr. St. Catharines, Ont. (T. R. D.).

CROWN RUST (Puccinia coronata) was rated 2-tr. 6-sl. 3-mod./21 fields surveyed in Sask. (B.J.S.) and 1-tr./6 fields on 9 Aug. in Man. (W. A. F. H.). Traces were found in 1/4 fields examined nr. St. Catharines (T. R. D.) and it was late in appearing but severe on late crops in e. Ont. (R. V. C.). Slight to moderate infections occurred in Quebec Seed Board test plots at La Pocatière and Riviere Ouelle, Kamouraska Co., Que. but no rust or only traces were seen at 19 other locations (D. L.).

STEM RUST (Puccinia graminis). Infection was rated 5% on 'Eagle' and 'Victory' oats in plots at Oyster River, B. C. (H. N. W. T.). Ratings in Sask. were 2-tr. 2-sl. 2-mod./21 fields surveyed (B. J. S.). It was not seen in a survey of 6 fields in Man. in early August (W. A. F. H.). Infection was severe on late-maturing crops in e. Ont. (R. V. C.). Infections were moderate at 7/21 test plot locations in Que. (D. L.).

SPECKLED LEAF BLOTCH AND BLACK STEM (Septoria avenae f. sp. avenae) was rated 1-tr. 2-sl./22 fields surveyed in s. Sask. (R. D. T.). It was as severe as has been seen in e. Ont. in recent years although infections appeared late (R. V. C.). Infection was severe at Riviere Bleue, Témiscouata Co., Que. (C. A.).

LOOSE SMUT (Ustilago avenae) was not found in 73 fields surveyed in Man. and Sask. (B.J.S., J.J.N.).

COVERED SMUT (Ustilago kolleri) was found in 1/14 fields in Sask. Infection was rated 6% (J. J. N.). None was found in another survey of 21 fields in Sask. (B. J. S.) or one of 38 fields in Man. (J. J. N.).

RED LEAF (barley yellow dwarf virus). Traces were seen in a field at Regina, Sask. (R. D. T.). The disease incidence was very light to negligible in Man. and Sask. except in the area between Dauphin and Neepawa, Man. Late-sown oats in this area were heavily infested with aphids and virus infection was severe. Individual ratings were 22-tr. 6-sl. 4-mod. 2-sev./39 fields examined (C. C. G.). Incidence was heavy in certain districts in e. Ont. (R. V. C.).

BLAST (physiological). Damage ranged from trace to severe in about half the fields examined in c. Alta. (L. J. P.) and was trace to slight in most oat fields visited in Sask. (R. D. T.). Moderate damage was seen at Riviere Bleue, Témiscouata Co., Que. (C. A.).

BARLEY

BLACK POINT (Alternaria tenuis, Bipolaris sorokiniana) was prevalent in the Red River Valley of Man. (W. C. McD.).

SPOT BLOTCH (Bipolaris sorokiniana) infection was rated 1-sl./13 fields in s. Alta. (J.S.H., T.G.A.) and 1-tr. 3-sl. 1-mod./31 fields surveyed in s. e. Sask. (R. D. T.). Moderate to severe infections were general in all areas of Man. (W. C. McD.).

COMMON ROOT ROT (Bipolaris sorokiniana, Fusarium spp.). Specimens were received from Big Valley, Brightview, Didsbury, Legal and Olds, Alta. (A. W. H.). It was encountered more frequently in fields west and north of Lacombe than in other areas surveyed in c. Alta. (L.J.P.). Ratings in s. Alta. were 1-tr. 4-sl. 2-mod./13 fields (J.S.H., T.G.A.). The average rating in 25 fields in Sask. was 11.8, considerably lower than in 1964 (B. J. S.). Two diseased fields were observed nr. Stony Mountain, Man. (W. A. F. H.). Infection was 20-30% in a field of 'Herta' and one of 'Charlottetown 80' in Queens Co., P. E. I. (C. B. W.).

ERGOT (Claviceps purpurea). A trace was seen in 1/13 fields examined in s. Alta. (J. S. H., T.G.A.) and trace amounts occurred in 6/31 fields observed in Sask. (R. D. T.).

ANTHRACNOSE (Colletotrichum graminicola) affected several acres at Didsbury, Alta. (A. W. H.).

STRIPE (Drechslera graminea) was trace in 1/13 fields surveyed in s. Alta. (J. S. H., T. G. A.).

POWDERY MILDEW (Erysiphe graminis) was observed in trace to slight amounts, late in the season, in e. Ont. (R. V. C.).

SPIKELET INFECTION (Fusarium sporotrichoides) occurred on 5% of the heads of one field in Man. (W. A. F. H., W. C. McD.).

STEM RUST (Puccinia graminis) was recorded on the varieties 'Olli', 'Wolfe', 'Gateway', 'Gateway 63', 'Cornpana', 'Parkland' and 'Palliser' in plots at Lacombe. Infection was severe in several commercial fields in the Ashmont, Alta. area (L. J. P.). It was rated 1-tr./13 fields examined in s. Alta. (J.S.H., T. G. A.) and 6-tr. 4-sl. 2-mod./21 fields in Sask. (B. J. S.). Stem rust was light on winter barley in w. Ont. and was more prevalent than usual in some areas of e. Ont. (R. V. C.). It was moderate to severe at 16/21 Quebec Seed Board testing stations in Que. (D. L.).

LEAF RUST (Puccinia hordei) was rated 1-tr./13 fields in s. Alta. (J. S.H., T.G.A.). A trace was observed in 1/2 fields examined nr. St. Catharines (T. R. D.) and trace to slight amounts were recorded in e. Ont. late in the season (R. V. C.).

NET BLOTCH (Pyrenophora teres). Specimens were received from Didsbury and Big Valley, Alta. (A. W. H.). Ratings of fields examined in the Peace River district of n. Alta. in late July were 36%-tr. 27%-sl. 18%-mod. (B. B.). Few barley fields east and north of Lacombe, Alta. were free of net blotch. Severe infections were, however, more common southeast of Lacombe (L. J. P.). It was rated 2-tr. 3-sl. 4-mod. 1-sev./10 fields examined in s. Alta. (J. S. H., T. G. A.). Net blotch was generally distributed in Sask. Ratings were 1-tr. 5-sl. 6-mod. 9-sev./31 fields surveyed (R. D. T.). Slight to moderate infections occurred in the area north of the Assiniboine River in Man. (W. C. McD.). It was trace in 1 field nr. St. Catharines, Ont. (T. R. D.).

SCALD (Rhynchosporium secalis). Specimens were received from Big Valley, Calgary, Didsbury, Olds, Stony Plain and Vegreville, Alta. (A. W. H.). Ratings of fields surveyed in n. Alta. in late July were: 18%-tr. 18%-sl. 27%-mod. 18%-sev. (B. B.). Scald was found in all areas surveyed in c. Alta. It was least prevalent northeast of Edmonton and most prevalent west of Lacombe. There were more severe infections northeast of Lacombe than in the other areas (L. J. P.). It was rated 2-tr. 2-sl. 4-mod./8 fields in s. Alta. (J. S. H., T. G. A.). Infections were slight in 4 fields in n. w. Sask. and moderate in 2 in s. w. Sask. out of 31 surveyed in the province (R. D. T.). Scald was prevalent in experimental plots in the Roblin-Russell area of Man. and was trace to slight in farmers' fields (W. C. McD.). It was observed in a few lines under test at Ridgetown (R. V. C.) and was trace in a field nr. St. Catharines, Ont. (T. R. D.).

SPECKLED LEAF BLOTCH (Septoria passerinii) was observed at Didsbury, Alta. (A. W. H.). Its occurrence was general in c. Alta., particularly in areas close to Lacombe. It caused little apparent damage (L. J. P.). Ratings were 3-tr. 3-sl./31 fields examined in Sask. All affected fields were in s. e. Sask. (R. D. T.). It was much more prevalent in Man. than in the last 5 years. Moderate infections were general throughout the province (W. C. McD.).

COVERED SMUT (Ustilago hordei). Specimens were received from Calgary and Claresholm (A. W. H.); a 10% infection was seen in 1 field in c. Alta. (L. J. P.) and it was mod. in 1/13 fields surveyed in s. Alta. (J.S.H., T.G.A.). It was rated 2-tr. 2-sl./24 fields examined in Sask. (B. J. S.) and 1-tr. 1-3%/29 fields in Man. (J. J. N.).

FALSE LOOSE SMUT (Ustilago nigra) was found in 2/20 fields in Sask. and in 3/29 fields examined in Man. (J. J. N.).

LOOSE SMUT (Ustilago nuda). Specimens were received from Berwyn, Dixonville, Spirit River, Mayerthorpe where infection was 10% and Keg River, Alta. where infection was rated 40% or more (A. W. H.). Trace to moderate infections were found in 50% of the fields examined southeast and west of Lacombe and in 60% of the fields east and north of Lacombe, Alta. Only 25% of the fields northeast of Edmonton were affected. One field had 10% infection (L. J. P.). Ratings were 3-tr./24 fields examined in Sask. (B. J. S.). Another survey in Sask. revealed 12/20 fields with trace to 6% infections. The mean infection ranged from tr.-4% with the mean at 0.7% in 9/29 fields in Man. (J. J. N.).

BACTERIAL BLIGHT (Xanthomonas translucens) caused damage in a wet, sheltered portion of a field at Stony Plain, Alta. (A. W. H.) and was abundant on 'Olli' and 'Gateway' at the Lacombe Experimental Farm but was not recorded elsewhere in c. Alta. (L. J. P.). Slight amounts were observed in 3 fields at Regina, Sask. (R. D. T.).

ASTER YELLOWS (aster yellows virus). Trace infections were found in 5/45 fields surveyed in Man. and e. Sask. (C. C. G.).

STRIPE MOSAIC (barley stripe mosaic virus) was present in experimental plots at Winnipeg and Portage la Prairie, Man. but was not found in 21 commercial fields examined (C. C. G.).

BARLEY YELLOW DWARF (barley yellow dwarf virus). Incidence was very light in Man. and e. Sask. except in the area between Dauphin and Neepawa where infection was heavy on late-sown crops. Ratings were 17-tr. 2-mod. 1-sev./21 fields surveyed (C. C. G.). Symptoms resembling yellow dwarf were observed in experimental plots at Regina, Sask. Aphids were numerous but the symptoms observed may have been a manifestation of mite damage (R. D. T.).

FROST BANDING was observed on seedlings at Wembley, Alta. in June (A. W. H.).

LEAF SPOT (physiological). This condition was observed in 2/13 fields examined in s. Alta. (J.S.H., T. G. A.).

WINTER KILLING. Winter barley was completely killed out at Ottawa and considerable killing was encountered at Guelph, Ridgetown and Harrow, Ont. (R. V. C.).

RYE

COMMON ROOT ROT (Bipolaris sorokiniana, Fusarium spp.) was slight in 1/2 fields examined nr. St. Catharines, Ont. (T. R. D.).

ERGOT (Claviceps purpurea) was found sparingly in hybrid 'Sangate' x 'Dakold' rye in plots at Edmonton (A. W. H.) and considerable amounts were observed, late in the season, at Lacombe, Alta. (L. J. P.). In s.w. Sask. ratings were 7-tr. 1-sl./9 fields surveyed (R.D.T.). Fifty percent of the heads of 'Tetra Petkus' had 2-8 ergots per head at St. John's West, Nfld. (O. A. O.).

STEM RUST (Puccinia graminis). Infection was moderate at Edmonton (A. W. H.) and was trace in 6 fields examined in c. Alta. (L. J. P.). Slight infections occurred on fall rye at widely distributed points in Sask. (B. J. S.).

SCALD (Rhynchosporium secalis). Trace infections were recorded in 6 fields examined in c. Alta. (L. J. P.).

SPECKLED LEAF BLOTCH (Septoria secalis). Infection was rated slight in 4/9 fields surveyed in s. w. Sask. (R. D. T.).

STEM SMUT (Urocystis occulata). This rarely-encountered smut was present in 1 field and was observed on volunteer plants in another instance in s. Alta. (T. G. A., M. N. G.). It was last reported to the Survey in 1955 (C. P. D. S. 35: 16. 1956) (D. W. Creelman)..

DISEASES OF FORAGE AND FIELD CROPS
A. Forage Legumes

ALFALFA

BLACK STEM (Ascochyta medicaginis). A high incidence of black stem was reported at High Prairie and specimens were received from Feisy and Edmonton, Alta. (A. W. H.).

WINTER CROWN ROT (low-temperature basidiomycete) caused damage to crops in the Edmonton, Alta. district (A. W. H.).

BACTERIAL WILT (Corynebacterium insidiosum) was rated 22-tr.-sl. 40-tr.-mod. 31-tr.-sev./93 irrigated fields in s. Alta. (E.J.H.). In another Alta. survey it was rated 2-tr./5 fields (J. B. L.).

DODDER (Cuscuta sp.) occurred in several alfalfa fields in the northern parts of the Okanagan Valley, B. C. (G. E. W.).

STEM NEMATODE (Ditylenchus dipsaci). Slight-severe infestations were found in 10/93 irrigated fields surveyed in s. Alta. (E. J. H.).

CROWN BUD ROT (Fusarium spp., Rhizoctonia solani, Ascochyta imperfecta). Ratings in irrigated fields in s. Alta. were 3-tr.-sl. 67-tr.-mod. 23-tr.-sev./93 (E. J. H.). Damage was 1-tr. 2-sl. 1-mod. 1-sev./5 other Alta. fields examined (J. B. L.).

YELLOW LEAF BLOTCH (Leptotrochila medicaginis). Minor damage was recorded in 1/5 fields surveyed in c. Alta. (B. B.).

DOWNY MILDEW (Peronospora aestivalis). Infection was rated 1-sl./5 fields examined in c. Alta. (B. B.).

COMMON LEAF SPOT (Pseudopeziza trifolii f. sp. medicaginis-sativae) was prevalent at High Prairie and it was also reported from Cherry Point and Edmonton, Alta. (A.W.H.). It was rated 3-sl./5 fields in c. Alta. (B.B.) and 2-tr./5 fields in s. Alta. (J.B.L.). Infections were general and mostly light on 'Vernal' in P.E.I. Moderate damage occurred in some crops where cutting was delayed (C. B. W.).

ROOT ROT (various organisms). Severe damage was general throughout P. E. I. (C. B. W.).

POTASSIUM DEFICIENCY. Slight symptoms were observed at La Pocatière, Que. (C. A.).

WHITE SPOT (physiological). Symptoms were observed at Edmonton, Peavine and Wetaskiwin, Alta. (A. W. H.).

COMMON CLOVER

BLACK STEM (Ascochyta imperfecta). Infections were rated 1-sl. 3-mod./7 fields of alsike in the Peace River district of B. C. and Alta. and 2-mod./13 alsike fields in c. Alta. On red clover it was rated 3-tr. 2-mod./12 fields in c. Alta. and 2-mod./6 fields in the Rimby-Blufton area (B. B.).

SOOTY BLOTCH (Cymadothea trifolii). Traces were seen in 1/7 alsike fields in the Peace River district and ratings were 1-tr. 2-mod./13 fields in c. Alta. (B. B.). Infections ranged from 75-100% and damage was moderate on alsike throughout P. E. I. (C. B. W.).

POWDERY MILDEW (Erysiphe polygoni) was rated 2-tr. 1-mod./7 alsike fields in the Peace River district of B. C. and Alta. and 3-sl. 1-mod./13 fields in c. Alta. Infections on red clover were 3-tr./11 fields in the Peace River district, 1-sl. 1-mod./12 in c. Alta. and 3-mod./6 in Rimby-Blufton area (B. B.). Infections of 20-40% were general on alsike, red and white clovers in P. E. I. They were particularly heavy on alsike. Average damage was slight (C. B. W.).

ROOT ROT (Fusarium spp.). Alsike clover in mixed stands was affected in the Lower St. Lawrence and Lake St. John areas of Que. F. oxysporum was the species most frequently isolated but F. avenaceum proved to be the most pathogenic to alsike. F. culmorum was intermediate as to frequency of occurrence and pathogenicity (C. A.).

NORTHERN ANTHRACNOSE (Kabatiella caulivora). Infections were 3-sl. 1-sev./11 red clover fields in the Peace River district of B. C. and Alta. In c. Alta. it was rated 3-sl. 5-mod./12 and in the Rimby-Blufton district it was rated 2-sl. 1-mod./6 fields (B. B.).

COMMON LEAF SPOT (Pseudopeziza trifolii f. sp. trifolii-pratensis). Infections ranged from 0-40% on red clover throughout P. E. I. and the average damage was slight (C. B. W.).

CROWN ROT (Sclerotinia trifoliorum) caused up to 50% mortality in stands of 'La Salle' red clover in P.E.I. Losses were heavy in some localities (C.B.W.).

GRAY LEAF SPOT (Stagonospora meliloti). Extensive infections were recorded at Derwent, Alta. (A. W. H.).

RUST (Uromyces trifolii). Infections were rated 3-sl. 5-mod./13 fields of alsike surveyed in c. Alta. (B. B.). It caused slight to moderate damage to alsike, red and white clovers in P. E. I. where infections ranged up to 25% (C. B. W.).

ROOT ROT (various organisms) was general and caused severe damage to alsike, red and white clovers in P. E. I. (C. B. W.).

PHYLLODY (Clover phyllody virus). Light, general infections were observed in a number of clover fields in Kings Co., N. S. (A. A. MacN., C. L. L.). Infections of up to 5% were general in alsike, red and white clover fields in P. E. I. (C. B. W.).

OTHER VIRUSES. Bean yellow mosaic virus and pea streak virus were tentatively identified and shown to be widely distributed throughout c. Alta. (B. B.).

WINTER KILLING. Ladino clover was severely injured by freezing temperatures in December in coastal B. C. Red clover was affected to a lesser extent (H. N. W. T.).

SWEET CLOVER

ROOT ROT (Phytophthora cactorum, Fusarium culmorum, F. oxysporum f. redolens) caused slight to moderate damage in 1/4 irrigated stands examined in s. Alta. (E. J. H.).

B. Oil-seed Crops

FLAX

WILT (Fusarium oxysporum f. lini) killed about 60% of the plants of an unknown variety in a field nr. Regina, Sask. (J. A. H.).

RUST (Melampsora lini). Traces were found at Regina but none was observed at 5 other locations in Sask. (B. J. S.). Rust, mainly race 300, was widespread throughout Man. but was of less frequent occurrence in Sask. east of the line Saskatoon-Regina. One field, nr. Regina, suffered severe rust damage (J. A. H.).

SEEDLING BLIGHT (Rhizoctonia spp., Pythium spp.) caused severe damage in 2/3 fields surveyed in s. Alta. (J. S. H., T. G. A.). It was general in the Red River valley of Man. and caused appreciable damage (J. A. H.).

PASMO (Septoria linicola). Specimens were received from Dauphin, Man. where the loss was reported to be over 50%. Most bolls were empty or contained shrunken seeds (W. C. McD.).

ASTER YELLOWS (aster yellows virus). Trace amounts were observed in plots at Saskatoon, Sask. (B. J. S.).

FROST CANKER. At Oak River, Man., 5% of the plants in a field were dead or showed a typical stem canker believed to be caused by frost 10 days earlier (W. C. McD.).

MUSTARD

WHITE RUST (Albugo cruciferarum) occurred on mustard at Vulcan, Alta. (A. W. H.).

POWDERY MILDEW (Erysiphe polygoni) was observed, often in association with white rust at Vulcan, Alta. (A. W. H.).

RAPE

WHITE RUST (Albugo cruciferarum) was observed in Sask. most frequently in the northeast region of the province. Infections were rated 10-tr. 10-sl. 4-mod. 2-sev./40 fields surveyed (G. A. P., T. C. V.).

WHITE RUST-DOWNY MILDEW COMPLEX (A. cruciferarum, Peronospora parasitica) was moderate to severe at Smokey Lake, St. Paul and Vegreville and moderate at Fabyan and 100 miles north of Edmonton. It was also reported from Legal, Fairview, Westlock, Morinville, Stony Plain, Ponoka and Sedgewick, Alta. (A. W. H.).

STEM AND POD SPOT (Alternaria spp.). Incidence was surprisingly low in 1965 (G.A.P., T.C.V.).

RING SPOT AND BLACK BLIGHT (Mycosphaerella brassicae) was rated 4-sev./7 fields examined in c. Alta. Early-maturing stands were severely infected with stems almost completely covered with fruiting bodies but later crops were clean. It appeared to cause little yield reduction (B. B.). In Sask. it was rated 4-tr. 5-sl. 14-mod. 3-sev./40 fields surveyed. It was present in 80% of the fields in the Meadow Lake area (G. A. P., T. C. V.).

DAMPING-OFF (Pellicularia praticola) was moderate to severe in a field nr. North Battleford and in one at Melfort, Sask. in June (G. A. P., T. C. V.).

DOWNY MILDEW (Peronospora parasitica). Trace infections were seen in 1/5 fields examined in the Peace River district and it was rated 5-sl./7 fields in c. Alta. In the latter area almost all the distortions of the seed heads were overgrown with an Alternaria sp. that was not found elsewhere on the plant or on plants unaffected by downy mildew (B. B.). In Sask. it was observed most frequently in the northeastern part of the province. Infections were strikingly severe in a few fields nr. Melfort and Nipawin. Ratings in the province were 1-tr. 1-sl. 2-sev./40 fields examined (G. A. P., T. C. V.).

BLACKLEG (Phoma lingam) is becoming more widespread in the east-central rape-growing area of Sask. (G. A. P., T. C. V.).

STEM ROT (Sclerotinia sclerotiorum) was seen scattered in many fields nr. Melfort and Nipawin, Sask. It was rated 5-tr. 2-sl. 2-mod. 2-sev./40 fields surveyed (G. A. P., T. C. V.). The disease was prevalent and caused some concern in Man. where losses of up to 10% occurred in individual fields (W. C. McD.).

ASTER YELLOWS (aster yellows virus). Infections were uniformly distributed throughout Sask. where ratings were 10-tr. 2-sl. 1-mod./40 fields examined. Affected plants were taller and were a darker green than were healthy ones (G. A. P., T. C. V.).

CHEMICAL INJURY. Damage from drift of the herbicide 2,4-D was observed in 6/40 fields surveyed in Sask. (G. A. P., T. C. V.).

ROOT ROT (cause undetermined). Specimens were received from Peace River, Sexsmith and Spirit River, Alta. (A. W. H.).

SOYBEAN

BROWN STEM ROT (Cephalosporium gregatum) was observed, though rarely, in s. w. Ont. (J. H. H.).

BACTERIAL BLIGHT (Pseudomonas glycinea) was seen in mid-season in all fields surveyed in s. w. Ont. (J. H. H.).

DAMPING-OFF (Rhizoctonia solani). Post-emergence damping-off occurred in scattered locations in s. w. Ont. (J. H. H.).

STEM ROT (Sclerotinia sclerotiorum) was present in a few fields in s. w. Ont. (J. H. H.).

LEAF SPOT (Septoria glycines) occurred in all fields examined but its effect on yield was minimal. Infection was restricted to the primary leaves (J. H. H.).

SUNFLOWER

HEAD ROT (Botrytis cinerea) was severe at Deschambault, Que. (D. L.).

RUST (Puccinia helianthi) was extremely scarce in Man. and caused no significant damage (J. A. H.).

LEAF MOTTLE (Verticillium albo-atrum) was of minor importance in Man. due partly to the inherent tolerance of 'Perodovik', currently the most widely planted variety (J. A. H.).

C. Root Crops

SUGAR BEET

BLACKLEG (Phoma betae). Damage was estimated at 5% in a 20-acre field at St. Barnabe and the disease was also seen at Ste. Rosalie, Que. (L. J. C.).

BLACK ROOT (Rhizoctonia solani). A field at St. Hughes, Que. suffered 80% damage in the seedling stage. A few plants continued to die during the season and the remaining ones were poorly developed (L. J. C.).

WINTER KILLING. As a result of sub-zero temperatures in Dec., 1964 in the lower Fraser Valley, B. C., over 600 acres of sugar beet stecklings were killed outright (H. N. W. T.).

D. Miscellaneous Crops

FIELD CORN

PINK EAR ROT (Fusarium graminearum) was more severe than usual in s.w. Ont. with damage ranging up to 15% in some crops. Most hybrids were affected. There were some reported cases of live-stock poisoning due to feeding moldy grain (R.E.W.).

ROOT AND STALK ROT (Fusarium graminearum). Although stalk rot was less severe in s.w. Ont. in 1965 than in previous years, root damage and stalk breakage due to other causes ranged from 5-30% (R. E. W.).

KERNEL ROT (Fusarium moniliforme). The hybrid 'Seneca 285' suffered about 15% loss at Adelaide, Middlesex Co., Ont. This hybrid has upright ears that contribute to poor drying of the grain. Kernel rot was occasionally observed in other areas of s.w. Ont. (R. E. W.).

OAT-CYST NEMATODE (Heterodera avenae) caused appreciable damage, mainly by retarding crop development by about 3 weeks, nr. Bowmanville, Ont. This appears to be a new host record for North America (S. G. F.). For a more complete account of this occurrence see Can. Plant Dis. Surv. 45: 105-106. 1965 (D. W. Creelman).

MOSAIC AND STUNTING (wheat streak mosaic virus) was observed in several hybrids in Essex and Kent Counties, Ont. Incidence was very low and only the occasional plant in weedy, border areas of the fields was affected although one field in Sandwich West Twp., Essex Co. had nearly 10% of the plants infected (Y. C. P., R. E. W.).

RED-STRIPED PERICARP (cause unknown) was more intense and more widespread in s. Ont. than in 1964 (R. E. W.).

HOP

HOP-CYST NEMATODE (Heterodera humuli) was found in hop roots from Sardis, B. C. (M. W.)

TOBACCO

LEAF SPOTS (Alternaria spp.) increased significantly in flue-cured tobacco in Ont. in 1965 probably because of favorable weather conditions. They were more severe in poorly drained fields (S. K. G.). They were observed, along with some spots of unknown origin, in several burley fields in Essex and Kent Counties, Ont. Some reduction in the quality of cured leaf was expected (C. D. McK.).

DAMPING-OFF (Pythium spp., Rhizoctonia solani, Fusarium spp.) was the most common seedbed disease of flue-cured tobacco in Ont. in 1965. Plant losses were estimated at 2% and it occurred in patches in beds during the later stages of growth. It is attributed to the recolonization of sterilized soil by the damping-off organisms (S. K. G.). It was also common in burley seedbeds in s.w. Ont. but overall damage was slight (C. D. McK.).

SORE SHIN (Rhizoctonia solani) was reported in a few flue-cured crops but it was generally not serious (S. K. G.).

POLE ROT (Rhizopus spp.). Rotting of leaves during curing was frequently encountered in Ont. Humid weather conditions and overcrowding of leaves in the kilns favored its development (S. K. G.).

BLACK ROOT ROT (Thielaviopsis basicola) caused an estimated 1% loss in seedbeds of the flue-cured crop due to improper sterilization. It was severe in the field on poorly drained soils in all tobacco growing areas of Ont. The overall financial loss was estimated at 5% with some individual growers having up to 30% losses. Relatively cool weather during the growing season favored the disease (S.K.G.). It was found in many burley fields in Essex and Kent Counties, Ont. Plants of the variety 'Green Briar' in plots at Harrow showed a remarkable growth response following a fumigation treatment with Vorlex (C. D. McK.).

TOBACCO VEINAL NECROSIS VIRUS was found in tobacco growing adjacent to an affected potato crop nr. Delhi. It had apparently been transmitted by aphids from the potatoes and had spread to a neighboring farm by the end of the season (S.K.G.). This is the first report of the occurrence of this virus in Canada (D. W. Creelman).

OTHER VIRUS DISEASES. Mosaic, ringspot and streak virus were observed in the flue-cured crop in Ont. though their incidence was negligible (S. K. G.). Tobacco etch developed in burley crops in s.w. Ont. late in the season and was found in only 2 fields. Tobacco mosaic, streak, ringspot, alfalfa mosaic and potato Y viruses were observed in trace amounts (C. D. McK.).

CHEMICAL INJURY. Improper application of agricultural chemicals, either in the greenhouse or in the field, caused considerable losses in the flue-cured tobacco crop on individual farms in Ont. (S.K.G.).

WEATHER FLECK (atmospheric pollution). Losses in flue-cured tobacco in Ont. were estimated at 1-2% and occurred mostly in areas bordering Lake Erie (S. K. G.).

E. Cultivated and Other Grasses

AGROPYRON - Wheatgrass

ERGOT (Claviceps purpurea). An occasional head of A. desertorum in an isolation plot in native prairie at Beaver Creek, Sask. was heavily infected. Ergot also caused slight damage in A. cristatum at Saskatoon (J. D. S.).

POWDERY MILDEW (Erysiphe graminis) was seen on A. cristatum in plots at Saskatoon and caused trace to moderate damage in A. trachycaulum in plots at Scott, Sask. At Scott, strains '1679', '1269', '1179' and '1556' were moderately affected (J. D. S.). A. repens was 100% infected at St. John's West, Nfld. (O. A. O.).

SLIME MOLD (Physarum sp. (prob. cinerea). An affected specimen of A. cristatum was received from Moose Jaw, Sask. (J. D. S.).

BASAL ROT (Rhizoctonia solani, Fusarium sp.) caused moderate to severe damage to a few spaced plants of A. intermedium in a breeding nursery at Saskatoon, Sask. (J. D. S.).

DOWNY MILDEW (Sclerophthora macrospora). A specimen of infected A. repens collected at Winnipeg, Man. was received from Dr. G. Semeniuk of Brookings, South Dakota. He also reports collecting it on A. cristatum at Lang, Sask. in 1962. See under Bromus (D. W. C.).

CHAR SPOT (Septogloeum oxysporum) was moderate on strain '1227' of A. trachycaulum on plots at Scott, Sask. Strains '1188', '1258', '1673' and '1697' showed trace infections (J. D. S.).

STEM SMUT (Ustilago spegazzinii) was general on A. repens nr. Summerland, B. C. Ten-25% of the plants showed distinct symptoms (G. E. W.).

WHITE HEADS (physiological). Five % of the heads of the variety 'Summit 62' of A. desertorum were affected in a field at Indian Head, Sask. (J.D.S.).

BRITTLE DWARF (aphid injury) was severe on the occasional spaced plant in plots at Saskatoon, Sask. (J. D. S.).

BROMUS - Bromegrass

ERGOT (Claviceps purpurea). A severe infection of B. inermis was recorded at Vilna, northeast of Edmonton, Alta. Other grasses also were heavily infected in a 5-10 mile area along the highway (B.B.).

LEAF BLOTCH (Drechslera bromi). Infection on B. inermis was heavy at Willingdon and specimens were received from Cherhill and Hughenden, Alta. (A. W. H.). It was rated 1-tr./4 fields in the Peace River district, 2-mod./2 in the Rimby-Blufton area and 1-sl./4 in c. Alta. (B. B.). Ratings were 11-tr. 26-sl. 12-mod. 2-sev./89 stands of B. inermis in Sask. (J. D. S.). *

POWDERY MILDEW (Erysiphe graminis) caused severe damage to B. inermis growing as a weed in a wheat crop at Big River, Sask. (J. D. S.).

SCALD (Rhynchosporium secalis). Trace infections were recorded in 2/4 fields of B. inermis in the Peace River district of Alta. (B.B.). Slight infections were seen at Saskatoon and Wierdale, Sask. (J.D.S.).

DOWNY MILDEW (Sclerophthora macrospora). Specimens of infected B. inermis from Cardston, Alta. and Winnipeg, Man. were received from Dr. G. Semeniuk, Plant Pathology Department, South Dakota State University, Brookings, S. D. He also reported collecting it nr. North Battleford, Sask. where he had previously collected it in 1963. Other collections of this pathogen on B. inermis in Western Canada cited by Dr. Semeniuk (G. Semeniuk and C. J. Martin. Phytopathology 54: 409-416. 1964) are: at Fort Saskatchewan, Alta., at Moosomin and nr. Lang, Sask. and at Brandon, Man., all in 1963 (D. W. C.).

LEAF SPOT (Selenophoma bromigena) was present in all fields of B. inermis examined in c. Alta. between May and Sept. It appeared early and maintained a limited infection throughout the season (B.B.). Ratings in Sask. were 31-tr. 25-sl. 12-mod. 11-sev./89 fields surveyed (J. D. S.).

LEAF SPOT (Septoria bromigena). This pathogen was isolated from B. inermis from 11 of the 89 localities surveyed in Sask. Infection was never severe (J. D. S.).

LEAF SPOT (Sporotrichum sp.). An undetermined species of Sporotrichum was associated with linear, gray leaf lesions on B. inermis at Saskatoon, Sask. in Sept. (J. D. S.).

ROOT ROT (pathogen undetermined). White rhizomorphs of an unidentified fungus were found in two nurseries and roadside B. inermis nr. Saskatoon, Sask. Affected plants were low in vigor and seed yields were low. One small fruiting body, associated, indicated that the fungus was a basidiomycete (J.D.S.).

ELYMUS - Wild rye

LEAF BLOTCH (Drechslera erythrospila (Drechs.) Shoem.) affected 75% of the plants of the variety 'Sawki' at Swift Current and lesser infections were observed at Regina, Saskatoon and Indian Head, Sask. D. erythrospila, as determined by R. A. Shoemaker, was isolated from lesions on plants at Saskatoon (J. D. S.). According to Dr. Shoemaker, this fungus has not been previously recorded on Elymus (D.W.C.).

HEAD SMUT (Ustilago bullata). Trace infections were seen on 'Sawki' at Regina, Sask. (J. D. S.).

FESTUCA - Fescue

NET BLOTCH (Drechslera dictyoides) caused slight damage to F. arundinacea, variety 'S62-5244' at Saskatoon, Sask. (J. D. S.).

* For a complete account of diseases of bromegrass in Saskatchewan in 1965, see Smith, J. D. Can. Plant Dis. Surv. 45: 118-119. 1965.

HORDEUM

FLAG SMUT (Urocystis agropyri). Specimens of H. jubatum bearing a trace infection were collected by A. Fuchs at God's Lake, Man. (J. J. N.).

LOLIUM - Ryegrass

WINTER KILLING was extensive in Lolium spp. in coastal B.C. and the lower Fraser Valley following the mid-December freeze of 1964 (H. N. W. T.).

PHALARIS - Canarygrass

LEAF SPOT (cause undetermined). The variety 'S-5573' of P. arundinacea in breeders' plots at Melfort, Sask. was 90% affected with infections ranging from trace to severe. A "Helminthosporium", possibly H. leucostylum Drechsl. and a species of Septoria were present. The Septoria was not S. bromi var. phalaricola (J. D. S.).

PHLEUM - Timothy

ERGOT (Claviceps purpurea). Infections were rated 2-tr. 1-mod./6 stands in the Peace River district, 2-mod./3 fields in the Rimby - Blufton area and 2-mod. 1-sev./5 stands in c. Alta. (B. B.).

EYE SPOT (Heterosporium phlei). Slight infections were seen in 2/5 fields examined in c. Alta. (B. B.).

DOWNY MILDEW (Sclerophthora macrospora) was collected on P. pratense at Bremner, Alta. by G. Semeniuk in 1962. See Bromus (D. W. C.).

SETARIA - Foxtail

DOWNY MILDEW (Sclerophthora macrospora) was collected in 1963 at Portage la Prairie, Man. by G. Semeniuk. See Bromus (D. W. C.).

LAWNS AND TURF

NEMATODES (Aphelenchoides sacchari Hooper) were found in association with Bipolaris sorokiniana in a lawn at Lethbridge, Alta. (E. J. H.).

SNOW MOLD (low-temperature basidiomycete). Damage was rated 4-tr. 3-mod. 2-sev./14 lawns examined in Alta. (J. B. L.).

MELTING-OUT (Bipolaris sorokiniana) was observed in a lawn at Lethbridge, Alta. (E. J. H.).

RED THREAD (Corticium fuciforme) affected Festuca rubra in lawns and golf courses in widely separated areas of Alta. High air temperatures combined with high relative humidity favored the disease (W. P. S.). F. rubra was moderately to severely damaged in a bowling green at Saskatoon, Sask. Small stromata of the pathogen were present (J. D. S.).

NET BLOTCH (Drechslera dictyoides) caused a moderate killing-out of Festuca rubra in a fescue-bluegrass lawn at Saskatoon, Sask. (J. D. S.).

LEAF BLOTCH (Drechslera poae) caused slight damage in several bluegrass lawns at Lacombe, Alta. (B. B.). Leaf lesions caused by this fungus were seen in every one of 30 lawns and turfgrass plots containing Poa pratensis that were closely examined in Sask. Leaf spotting was most apparent in August and September at Saskatoon, later than usual. Damage was slight to moderate (J.D.S.). Infection was 100% on 'Merion' bluegrass at St. John's, Nfld. Little damage was apparent (O. A. O.).

POWDERY MILDEW (Erysiphe graminis). Damage from mildew was moderate to severe on bluegrasses in turf plots at Saskatoon, Sask. It was more severe on 'Kentucky' than on 'Merion' and 'Park', Chains of conidia were still present on specimens from Saskatoon in early November (J. D. S.).

SNOW MOLD (Fusarium nivale) caused moderate damage in 2/14 lawns examined in Alta. (J. B. L.).

FAIRY RING (Marasmius oreades). Damage was rated 1-sl. 10-mod. 3-sev./14 lawns examined in Alta. (J. B. L.).

SLIME MOLD (Physarum cinereum). Several specimens were received from lawns from Saskatoon, Sask. (J. S. D.).

LEAF BLIGHT (Pleospora sp.). An undetermined species of Pleospora was recovered several times from leaves of Poa pratensis in lawns at Saskatoon and North Battleford, Sask. and in a bowling green at Saskatoon. Perithecia were first noted in April and last observed in the inflorescence of Poa annua in September (J. D. S.).

SNOW MOLD (Typhula itoana) was severe on much of the fine turf consisting of Poa pratensis, Festuca rubra and Agrostis spp. in Saskatoon, Sask. and in other parts of the province. In the 10 cases investigated in Saskatoon, sclerotia typical of T. itoana were recovered. The resulting turf damage was still apparent in July and August in Saskatoon (J.D.S.).

DISEASES OF VEGETABLE CROPS

BEAN

LEAF SPOT (Ascochyta? bolthauseri) was severe in a planting of kidney beans at Ste. Foy, Que. (D. L.). The occurrence of this pathogen has not been previously reported to the Survey although its presence in B. C. has been recorded elsewhere (D. W. C.).

GRAY MOLD (Botrytis cinerea) affected 30% of the crop in 7 fields at Florenceville, N.B. at harvest. Almost all infections originated from floral parts which had fallen and adhered to the pods. Light blossoming fields and late plantings had only a trace of infection (S. R. C.).

ANTHRACNOSE (Colletotrichum lindemuthianum). Trace to 7% infections were seen in 7/14 fields in the Florenceville and Gagetown districts of N. B. The higher infections were in small plantings and home gardens (S. R. C.).

ROOT ROT (Fusarium spp., Rhizoctonia solani). What may have been a moderate attack by the fungus complex at Cloverdale, B. C. was intensified by drought and failure of the remaining roots to supply adequate water. Symptoms on pole beans were severe by early August (H. N. W. T.). Infection by F. solani was severe throughout southwestern Ont. and especially so in Lambton and Middlesex Counties. Affected plants appeared to recover somewhat by late season and the main effect of the disease was to cause late flowering and maturity (J. H. H.). A survey in August in s.w. Ont. showed 11/61 fields to be affected by root rot, usually in patches in the fields. Severity was generally slight but some plants were severely infected and yields in certain fields would be reduced. It was observed in 'Seaway' and 'Sanilac' but not in 'Saginaw' or 'Michilite' (V.R.W., M.D.S.). Root rot caused by R. solani affected bean plantings in home gardens in P. E. I. to a moderate degree. Cold, backward spring weather favored its development (J. E. C.).

HALO BLIGHT (Pseudomonas phaseolicola) was moderate in 3 fields grown for processing nr. Taber, Alta. (F. R. H.). Infection ranged up to 60% in 11/14 small plantings examined in N. B. No damage was observed in 2300 acres grown for processing (S.R.C.).

SCLEROTINIA WILT (Sclerotinia sclerotiorum). Trace amounts were reported on young pole beans in the lower Fraser Valley of B. C. (H. N. W. T.). It caused losses, late in the season, in Huron, Perth, Elgin and Kent Counties, Ont. Its severity in Lambton and Middlesex Counties was mitigated by the reduced growth of plants as the result of drought and root rot (J. H. H.). Wilt was observed in s.w. Ont. in 10/30 fields of 'Sanilac' and 13/26 fields of 'Seaway' surveyed. Infection in individual fields ranged from a few to 50% of the plants. Yields were expected to be considerably reduced. This was the most important disease encountered in the bean crop in 1965 (V. R. W., M. D. S.). Specimens were received from Nipissing, Ont. with the observation that most of a home planting was lost (J. B. J.). Trace infections were seen in 2/7 crops examined at Florenceville, N. B. (S. R. C.) and it was trace on 'Tendercrop' in a garden at Kentville, N. S. (K. A. H.).

RUST (Uromyces phaseoli). Trace amounts were seen in pole beans in late August at Cloverdale and Queensborough, B. C. A light, late infection is usual in dry summers on the B. C. coast (H. N. W. T.). It was prevalent throughout a field of several acres at Vernon, B. C. The foliage and, to a lesser extent, the pods were affected (G. E. W.).

COMMON BLIGHT (Xanthomonas phaseoli). Specimens were received from Calgary, Stettler and Edmonton, Alta. (A. W. H.). It was rarely encountered in early-season surveys in s.w. Ont. but was more prevalent by mid-season, particularly in Essex and Kent Counties (J. H. H.). An August survey of fields in s.w. Ont. revealed bacterial blights in 27/61 fields. Infection ranged from trace amounts to 100% of the plants. Yields in totally-infected fields could be reduced 50%. X. phaseoli var. fuscans was the organism most frequently isolated followed by X. phaseoli and Ps. phaseolicola in that order. Only 3/24 fields sown with Michigan-grown seed were infected in contrast to 24/37 fields from Ontario-grown seed (V.R.W., M. D. S.).

CURLY TOP (beet curly top virus) affected the young terminal leaves of most of the plants in a commercial crop of several acres of 'Bluelake' at Vernon, B. C. Infection occurred late in the season (G. E. W.).

COMMON MOSAIC (bean mosaic virus) was observed in commercial fields of bush beans in the Vernon, B. C. area (G. E. W.).

BEAN YELLOW MOSAIC (bean yellow mosaic virus) was found in bush beans in the Vernon, B. C. area (G. E. W.).

CHEMICAL INJURY. Drift of the herbicide atrazine from an adjacent corn field killed all the bean plants in a field at Jemseg, N. B. (S. R. C.).

SUNSCALD affected several acres of snap beans for processing at Laprairie, Que. (R. C., L. J. C.). About 10% damage to upper foliage was seen in 3/7 fields examined at Florenceville, N. B. (S. R. C.).

BEET

LEAF SPOT (Cercospora beticola) was observed in a 5-acre field of beets at Port Williams, N. S. (A. A. MacN.).

SCAB (Streptomyces scabies). Trace amounts were seen on 'Detroit Dark Red' in a garden planting at Kentville, N. S. (K. A. H.).

BROCCOLI

BORON DEFICIENCY. Injury was severe in a planting at Chilliwack, B. C. Flower heads, stems and leaf petioles were covered with light-brown, corky lesions. Some splitting of the outside of petioles occurred but no internal splitting, which is usual with boron deficiency, was observed (H.N.W.T.). It was observed in 3 crops at Florenceville, N.B. where the condition was followed by soft rot (S. R. C.).

BRUSSELS SPROUTS

WHIPTAIL (molybdenum deficiency) was observed in trace amounts in 2/11 fields examined at Rogersville, N. B. (S. R. C.).

CABBAGE

DOWNY MILDEW (Peronospora parasitica). Infection was 70% in one field at Cole Harbour, Halifax Co., N.S. Traces were seen in other fields at Cole Harbour and at Addington Forks, Antigonish Co. and Second Peninsula, Lunenburg Co., N.S. (A.A.MacN.).

BLACKLEG (Phoma lingam). Several cultivars at St. John's West, Nfld. were slightly damaged by a 10% infection (O. A. O.).

CLUB ROOT (Plasmodiophora brassicae). Infection ranged from trace to 75% in 4/11 fields examined at Oromocto, N. B. (S. R. C.). Trace infections were seen at River Hebert, Cumberland Co. and at Brentwood, Colchester Co., N. S. Infections of 75-100% were recorded at Bras d'Or, Cape Breton Co. and at Heatherton and Addington Forks, Antigonish Co., N.S. (A.A.MacN.). Infections were generally light in eastern Nfld. (O. A. O.).

WIRE STEM AND BOTTOM ROT (Rhizoctonia solani). Severe infections caused heavy losses in seedbeds at Cole Harbour, Halifax Co. Losses from bottom rot were about 5% in the field at Falmouth, Hants Co., N. S. (A. A. MacN.).

BLACK ROT (Xanthomonas campestris). One row of an unknown variety was 100% infected at Heatherton, Antigonish Co., N.S. The main variety in the field was unaffected (A. A. MacN.).

CARROT

LEAF BLIGHT (Alternaria dauci). Infection was rated 6-tr./13 fields surveyed in s.w. Que. (T. S., R. C.) and was 30% in 1/9 fields at Oromocto, N.B. (S.R.C.). A. dauci along with Cercospora carotae affected up to 100% of the plants in crops at 4 locations in Cape Breton Co., N. S. where no protective fungicides had been used. Trace infections only were seen in Kings Co. where protective fungicides had been applied (A.A.MacN., K.A.H., C.O.G.).

LEAF BLIGHT (Cercospora carotae). Trace infections were seen in 5/13 fields examined in s.w. Que. (T. S., R. C.).

ROOT-KNOT NEMATODE (Meloidogyne hapla). Damage, in a plot known to be heavily infested at Ste. Clothilde, Que., was only slight in both 1964 and 1965 (T. S., R. C.).

STORAGE ROT (Sclerotinia sclerotiorum). Specimens were received from Plamondon, Fort Saskatchewan, Edmonton and Winterburn, Alta. in November (D. S.). This rot, in conjunction with gray mold and bacteria caused an 8% loss at Oromocto, N. B. (S.R.C.) and very slight losses in washed carrots at Grand Pré, N. S. (A. A. MacN.).

ASTER YELLOWS (aster yellows virus) caused slight damage in a 60-acre planting at Rosemary, Alta. (F. R. H.). Damage was estimated at 10-35% in 9 fields examined at Oromocto, N. B. (S. R. C.). Infection was rated trace at Harbour Center, Antigonish Co. and at Cole Harbour, Halifax Co.; 5% at Old Barns, Colchester Co. and Minudie, Cumberland Co.; slight at Berwick, Kings Co. and severe at River Hebert, Cumberland Co., N. S. (A. A. MacN., K. A. H.). Infection was 45% on 'Touchon' and damage was severe at O'Leary, P. E. I. (G. W. A.).

CAULIFLOWER

DOWNY MILDEW (Peronospora parasitica). Trace infections were seen at Cole Harbour, N.S. (A.A. MacN.).

CLUB ROOT (Plasmodiophora brassicae). Moderate to severe injury occurred in a field nr. Windsor, Ont. (J.R.R.) and infection was trace at Brentwood, Colchester Co., N. S. (A. A. MacN.).

WIRE STEM (Rhizoctonia solani). Plants at Spirit River, Alta. were heavily infected (A. W. H.).

DAMPING-OFF (Rhizoctonia solani) caused the loss of 80% of the seedlings in hot frames at Yarmouth, N. S. (A. A. MacN.).

BLACK ROT (Xanthomonas campestris) caused 3% loss in 1/11 fields examined at Oromocto, N. B. (S.R.C.).

BORON DEFICIENCY, followed by a breakdown of head tissues was responsible for trace-30% losses in 7/11 fields examined at Oromocto, N.B. (S.R.C.).

CELERY

LEAF SPOT (Cercospora apiicola). An extremely heavy infection of the cultivar 'Utah 5270' in a 2-acre field at Cole Harbour, N. S. caused a 50% reduction in yield. Eight % of the plants were affected on 23 July and by harvest in mid-Sept. all plants bore heavy infections; the outer leaves were completely dead and the outer petioles bore many lesions. No protective fungicides were used (A. A. MacN.).

BACTERIAL BLIGHT (Pseudomonas apii). Infection was rated 3-tr./10 fields examined in s.w. Que. In experimental plots at Ste. Clothilde it was trace on 'Utah D-5' and 'Utah 5270' and slight on 'Utah 10-B' and 'Utah 1611' (T.S., R.C.).

PINK ROT (Sclerotinia sclerotiorum). Traces were seen in 3/10 fields surveyed in s.w. Que. (T.S., R.C.).

ASTER YELLOWS (aster yellows virus). One of ten fields examined in s.w. Que. had a trace of infection (T.S., R.C.).

MOSAIC (cucumber mosaic virus). Infections were rated 2-tr./10 fields in s.w. Que. (T.S., R.C.).

CHICORY

ROOT ROT (Sclerotinia sclerotiorum). Lesions were prevalent on chicory roots for forcing in Gosfield South Twp., Essex Co., Ont. Loss was estimated at 10-12% (J.R.C., C.D.McK.).

CUCUMBER

LEAF BLIGHT (Alternaria cucumerina) was severe on 'Ashley Hybrid' at Ladner, B.C. by mid-Sept. 50% of the plants in 900 feet of row were dying, This is the first report from coastal B.C. of real damage caused by this pathogen. A. tenuis has occasionally been a nuisance in smaller plantings. The pathogen was determined by J.W. Groves (H.N.W.T.). The season was very favorable for the disease in N.S. and foliage of the cultivars 'Marketer', 'Armour', 'Highmoor' and 'Burpee Hybrid' was destroyed early in Kings, Antigonish and Cape Breton Counties (A.A.MacN., K.A.H., C.O.G.). It was also heavy, affecting 50% of the leaves, in a greenhouse crop at Horton, N.S. (A.A.MacN.).

GRAY MOLD (Botrytis cinerea). Specimens of rotted fruit were received from Edmonton, Alta. (A.W.H.). Gray mold was prevalent in greenhouse crops in s.w. Ont. Damage was difficult to estimate since blossom infection reduced the set in many houses (J.R.R.). Trace infections were seen in 23/31 fields examined in the Sheffield area, N.B. (S.R.C.).

SCAB (Cladosporium cucumerinum) was reported on pickling cucumbers on Lulu Island and from home gardens in the Vancouver, B.C. area (H.N.W.T.). Infection was heavy on 'Saticoy Hybrid' in a 2-acre planting nr. Burlington, Ont. Forty % of the fruits were scabbed by 23 July (C.B.K.). A severely scabbed fruit was received from Ottawa, Ont. (D.W.C.) and it was severe at Lotbiniere, Que. where stems and leaves as well as fruit bore heavy infections (D.L.). It was especially troublesome in all parts of N.B. in 1965 and 36/40 fields examined had trace-100% infections (S.R.C.). Up to 50% of the fruits of 'Straight 8' and 'Marketer' were affected in N.S. 'Highmoor' was affected only at Addington Forks, Antigonish Co. Resistant cultivars stood up well and no scab was seen on either 'Highmoor' or 'Armour' until they were defoliated by leaf blight (A.A.MacN., K.A.H.).

POWDERY MILDEW (Erysiphe cichoracearum) was prevalent and difficult to control in both field and greenhouse crops in s.w. Ont. Maneb sprays or dusts gave some degree of control but it was far from satisfactory (J.R.R.).

ROOT ROT (Fusarium sp.). Specimens were received from several small plantings on Lulu Island, B.C. It was intensified by a relatively dry summer (H.N.W.T.).

ANGULAR LEAF SPOT (Pseudomonas lachrymans) was reported from Edmonton (A.W.H.) and caused moderate damage in a planting at Coaldale, Alta. (F.R.H.). Trace infections were seen on leaves and fruit at Saskatoon (R.J.L.) and it was found affecting 50% or more of the plants in 38/40 fields examined in N.B. (S.R.C.).

ROOT ROT (Rhizoctonia solani) caused moderate damage in a planting at New London, P.E.I. (J.E.C.).

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was observed in commercial greenhouse crops at Summerland, B.C. (G.E.W.) and caused 3% loss in 1/3 fields examined at Oromocto, N.B. (S.R.C.).

LEAF SPOT (Septoria cucurbitacearum) affected the old leaves on all plants in a garden at Yarmouth, N.S. (A.A.MacN.). This is the first report, to the Survey, of this pathogen on cucumbers (D.W.C.).

MOSAIC (cucumber mosaic virus) was reported from Edmonton, Alta. (A.W.H.). A few fields of the slicing cucumber 'Marketer' nr. Chatham, Ont. suffered some damage. Large aphid populations were observed in the affected fields (J.R.R.). Infections were general and severe throughout Que. Its high incidence seemed to be related to unusually cool nights. Specimens were received from Neuville, Beauport, St. Isidore, St. Elphege and La Tuque (D.L.).

DIE-BACK (physiological) caused 50-90% damage in 6/6 fields examined on Ile Jesu, Que. Tissues at the leaf margins dried out and in many cases runners did not form. Low temperatures, drought and strong winds seemed responsible (L.J.C.).

EGGPLANT

WILT (Verticillium dahliae) occurred in all commercial plantings of 'Black Beauty' in the Vernon district, B.C. (G.E.W.). In 2 fields at Harrow, Ont. 80-90% of the plants were infected at the time of first harvest (C.D.McK.).

LETTUCE

GRAY MOLD (Botrytis cinerea) was recorded, usually in trace amounts, in 7/11 fields examined in 3 N.S. counties. Infection was significant only at Abercrombie, Pictou Co. where it reached 5% (A.A. MacN.).

DOWNY MILDEW (Bremia lactucae) was rated 3-tr. 1-sl./6 fields surveyed in s.w. Que. (T.S., R.C.). It appeared early at Cole Harbour, N.S. and by mid-Sept. all plants in most fields were infected (A. A. MacN.).

MARGINAL LEAF BLIGHT (Pseudomonas marginalis) was found for the first time in s.w. Que. where trace infections were seen in 2/6 fields surveyed (T.S., R.C.). It has previously been reported from Ont. and Man. (D.W.C.).

BOTTOM ROT (Rhizoctonia solani) caused minor damage in 4/6 fields examined in s.w. Que. (T.S., R.C.).

DROP (Sclerotinia sclerotiorum). Five % of the plants of a green heading type lettuce were killed in early May in a market garden nr. Vancouver, B.C. The cause of death of another 6.5% could not be determined. In another area drop was responsible for 10.7% of 34% of the lettuce plants killed. Little rotation was practiced in either case (H.N.W.T.). Small amounts of drop were seen in 3/6 fields surveyed in s.w. Que. (T.S., R.C.). Damage was estimated at 1% in fields at Cole Harbour and Grand Pré, N.S. (A. A. MacN.).

ASTER YELLOWS (aster yellows virus). Infection in experimental plots in Man. ranged up to 50%. No survey was made of commercial fields (C.C.G.). Traces of infection were found in 4/6 fields examined in s.w. Que. (T.S., R.C.) and in 2/3 fields at Oromocto, N.B. (S.R.C.). No aster yellows was found in early-season surveys in N.S. but it increased with later plantings (A. A. MacN.). It caused severe damage in 'Great Lakes' at Charlottetown, P.E.I. (G.W.A.).

MOSAIC (lettuce mosaic virus). Traces were seen in 2/6 fields examined in s.w. Que. (T.S., R.C.).

TOBACCO NECROSIS (tobacco necrosis virus). Roots of 10 lettuce plants picked at random from 3 fields nr. Winnipeg, Man. were assayed on cowpea and common bean and all were found to be infected with TNV. This virus is known to be widespread but it usually causes little or no visible damage on lettuce. Some brown lesions caused by the virus were observed on some of the roots (C.C.G.).

TIP BURN (physiological) was observed in 12 fields surveyed in 5 N.S. counties. Damage ranged from trace-20%. It was usually light up to the harvest stage and severe on over-mature heads (A. A. MacN.).

MINT

RUST (Puccinia menthae). Infection was slight in a small planting nr. Abbotsford, B.C. (H.N.W.T.).

MUSKMELON

SUDDEN WILT (cause undetermined). Two 4-acre fields of Fusarium-resistant muskmelons at Leamington, Ont. showed a sudden wilting of the foliage about 10 days to 2 weeks before harvest. The condition is thought to be induced by low temperatures (C.D. McK.).

ONION

PURPLE BLOTCH (Alternaria porri) was rated 1-tr. 2-sl./24 fields examined in s.w. Que. (T.S., R.C.).

NECK ROT (Botrytis allii). Up to 30% of the large bulbs of a 120-ton crop from muck soil at Cloverdale were infected. The grower had not followed the recommended heat-curing program (H.N.W.T.). Some neck rot had developed on onions in storage in the Okanagan Valley, B.C. by November (G.E.W.). Infections of up to 20% were found in several bags of onions from the muck soil area of s.w. Que. Commercial storage firms reported losses ranging upwards to 40-60% from neck rot and bacterial soft rot (R.C.). Specimens were received from local market sources in Quebec City, Que. (D.L.). Losses averaging 25% were incurred in a commercial storage at Waterville, N.S. They varied from 5-50% in different parts of the storage. Some of the infection may have followed frost damage which was evident on a few of the bulbs at harvest (A. A. MacN.).

LEAF FLECK (Botrytis cinerea). Trace infections were seen in 2/24 fields examined in s.w. Que. (T.S., R.C.) and infection was severe in a field at Neuville, Portneuf Co., Que. (D.L.). Traces were seen in 1/3 fields observed at Maugerville, N.B. (S.R.C.), slight infections at Canning and Harbour Center and a severe infection at Cole Harbour, N.S. (A. A. MacN.).

LEAF BLIGHT (Botrytis squamosa). Infections were rated 8-tr. 2-sl./24 fields surveyed in s.w. Que. (T.S., R.C.).

SOFT ROT (Erwinia carotovora), combined with neck rot, Botrytis allii, was responsible for losses of up to 60% in commercial storages in s.w. Que. (R.C.).

BASAL ROT (Fusarium oxysporum f. cepae) caused heavy losses in spring-planted onions, especially to hybrid onions, in the Okanagan Valley, B.C. The hybrids have proven to be very susceptible to this organism in the B.C. Interior in contrast to the open-pollinated cultivars which exhibit much more resistance (G.E.W.). Damage was estimated at 10% in a 1-acre planting at Rougemont, Que. (R.C.).

DOWNY MILDEW (Peronospora destructor). Inadequately sprayed crops in the Okanagan Valley, B.C. suffered some losses (G.E.W.). It was also observed at Neuville, Que. (D.L.).

PINK ROOT (Pyrenochaeta terrestris) was rated 1-tr. 1-sl./24 fields surveyed in s.w. Que. (T.S., R.C.).

WHITE ROT (Sclerotium cepivorum) occurred on fall-planted onions at Oliver, B.C. (G. E. W.). This disease, not observed in the muck soil areas of s. w. Que. since 1962 was rated 2-tr. 4-sl. 3-mod./30 fields examined. No explanation can be offered of the means by which soils in this area have become infested since neither sets nor transplants are used in the muck soil areas (T. S., R. C.).

SMUT (Urocystis magica). Infection was 30% in bunching onions in a market garden nr. Vancouver, B.C. (H. N. W. T.). It occurred in most crops in the Kelowna, B.C. district but it was generally well controlled through seed treatments or the use of chemically-treated clay granules added to the seed furrows (G. E. W.). Smut was rated 1-tr. 1-sl./24 fields surveyed in s. w. Que. (T. S., R. C.).

LEAF DAMAGE (wind, hail, etc.) was moderate in 5/25 fields examined in s. w. Que. (T. S., R. C.).

PEA

ASCOCHYTA BLIGHT (Ascochyta pisi). Affected specimens were received from Edmonton, Ponoka and Maple Creek, Alta. (A. W. H.).

POWDERY MILDEW (Erysiphe polygoni). Specimens were received from Vegreville, Maple Creek, Lacombe, Queenstown and Ponoka, Alta. (A. W. H.). Infection was widespread in Sask. (R.J.L.) and slight on 10% of the plants in a field of 'Century' on the Experimental Farm, Ottawa, Ont. (V.R.W.). It was general in N. B. but not severe as it appeared late (S. R. C.) and was severe on old foliage at Minudie, Cumberland Co., N. S. (A.A.MacN.).

WILT (Fusarium oxysporum f. pisi) was absent or occurred in trace amounts only in wilt-susceptible and wilt-resistant cultivars in plots at Lethbridge, Taber and Scandia, Alta. (F. R. H.).

MYCOSPHAERELLA BLIGHT (Mycosphaerella pinodes). A few plants were infected in a 1-acre field of 'Century' at Ottawa, Ont. (V.R.W.).

SEEDLING BLIGHT (Pythium spp.). Emergence of plants from untreated seed in plots was 15% at Taber and 50% at Lethbridge, Alta. Emergence from seed treated with captan and other fungicides was 90-95% (F. R. H.)

ROOT ROT (Pythium spp., Fusarium spp., Rhizoctonia solani). Infection was trace to slight in a field nr. Chilliwack, B. C., especially in low-lying patches. The condition was intensified by dry weather (H. N. W. T.). It was moderate in test plots at Taber and Lethbridge and trace in a field nr. Vauxhall where peas had not previously been grown (F. R. H.). Rhizoctonia root rot affected pea plantings in home gardens in P.E.I. It was favored by cold, backward spring weather (J.E.C.).

LEAF SPOT (Septoria pisi). Infection was 3%, mostly on the lower leaves, in a 1-acre field of 'Century' at Ottawa, Ont. (V.R.W.).

RUST (Uromyces fabae). A few plants of 'Century' were infected at Ottawa, Ont. (V. R. W.). It is common on peas in N. S. but appears late and does little damage. A planting at Minudie, Cumberland Co. was 100% infected (A.A.MacN.).

ENATION MOSAIC (pea enation mosaic virus) affected a few plants in a 1-acre planting of 'Century' at Ottawa, Ont. (V.R.W.).

STREAK (pea streak virus) was seen on a few plants of field peas at Ottawa, Ont. (V.R.W.).

PEPPER

WILT (Verticillium dahliae). Infections ranging from trace to 10% of the plants occurred in a number of commercial plantings in the Okanagan Valley, B.C. (G.E.W.). All fields in the Harrow-Leamington area of Ont. had trace to slight infections. Virtually all the plants of 'Vinequeen', 'Lincoln Belle' and 'Staddon's Select' were infected in an 8-acre field at Harrow (C.D.McK.).

BLOSSOM-END ROT (physiological). Drought was responsible for an unusually high incidence of blossom-end rot at Kentville, N. S. (K.A.H.).

POTATO

EARLY BLIGHT (Alternaria solani) was more prevalent than usual in central B.C. and the Cariboo. Some crops of 'Warba' and 'Norland' were killed down before the end of August (N. M.). It was rated 15-sl. 2-mod./79 seed fields in n. Alta. and 26-sl.-mod. 4-sev./114 in s. Alta. (R. P. B., R. P. S.) and it was observed at Ponoka, High Prairie, Stony Plain, Drumheller and Calgary, Alta. (A.W.H.). Incidence was sl.-mod. in most potato fields in Sask. (R.J.L.) and slight infections only were seen in Man. and n.w. Ont. (D.J.P.). Ratings were 15-sl. 2-mod. 2-sev./47 fields inspected in e. Ont. (G.E.B.F.). It was more prevalent in Que. than in 1964, mainly in the Chicoutimi area and northwest of Montreal. Infection was rated 225-sl. 31-mod. 9-sev./858 seed fields (G. E.). The disease was particularly noticeable on the Fredericton seedlings F5317, F5636, F6112, F5858, F6130, F6133 and F6103 at Les Buissons, Saguenay Co., Que. (H.G.). Infection was heavy and defoliation occurred in the early potato growing areas of N. B. (S. R. C.). A few moderate infections were seen on 'Keswick' and 'Norland' in Kings Co. and on 'Irish Cobbler' in Cumberland Co., N. S. (R. C. L.). Slight to moderate infections were seen in a few fields in P. E. I. (G. C. R.) and in the Conception Bay area of Nfld. (O. A. O.).

GRAY MOLD (Botrytis cinerea) caused trace amounts of damage in a low, wet area of a field at Grand Falls, N. B. (S. R. C.).

BLACK DOT (Colletotrichum coccodes) was observed at Wainwright, Alta. (A. W. H.) and was severe in a fourth crop field of potatoes at Ste. Famille, Ile Orleans, Que. (D. L.). One field of 11 acres in Kings Co., N.S. was dead by 1 Sept. and damage from

black dot in the county in many instances reached 10%. It was most severe in 'Kennebec' and 'Netted Gem' with 'Green Mountain' also affected. In one instance 'Katahdin' growing adjacent to infected 'Netted Gem' was not affected (A.A.MacN., K.A.H., C.O.G.).

BACTERIAL RING ROT (Corynebacterium sepedonicum) occurred in only 3/193 seed fields in Alta. (R.P.B., R.P.S.) but ring rot was identified in table stock in Alta. as follows: 52 specimens from Lethbridge, 27 from Edmonton, 11 from Brooks and 4 from Calgary (A.W.H.). Four seed fields were rejected in Man. (D.J.P.) as were 98/858 in Que. (G.E.). Three seed fields of 'Arran Victory' were rejected in N.S. where 10 fields of table stock were also affected (R.C.L.). Incidence in P.E.I. increased over 1964 and 22/4,466 fields and 30 contact fields involving a total of 628 acres were rejected (G.C.R.). It was widespread in Nfld. with symptoms most severe in 'Arran Victory' (O.A.O.).

BLACKLEG (Erwinia atroseptica). Incidence decreased considerably from 1964 levels in all districts of B.C. (N.M.) but increased considerably in Alta. particularly on heavier soils (R.P.B., R.P.S.). Specimens were received from a number of Alta. districts (A.W.H.). Nine seed fields were rejected in Man. and 73% of the fields in n.w. Ont. showed trace infections (D.J.P.). More blackleg than usual was seen in the Guelph, Ont. district where 11 seed fields were rejected and 7 reduced to Certified grade (J.W.G.). Ratings were 19-tr./47 fields in e. Ont. (G.E.B.F.). Incidence increased slightly in Que. where 558/858 fields were affected. However, fewer than half as many fields were rejected as in 1964 (G.E.). Infection ranged from trace to 18% in 4/11 fields examined at Jemseg and Evendale, N.B. (S.R.C.) and was rated 47-tr./210 seed fields in N.S. (R.C.L.). Incidence dropped markedly from 1964 levels in P.E.I. where ratings were 1,312-sl. 930-mod. 49-sev./4,466 seed fields. There were 85 rejections compared with 271 in 1964 (G.C.R.). Infected plants could be found in practically all potato fields in e. Nfld. A green, soft rot of stems was also found but its connection with blackleg is uncertain (O.A.O.).

SOFT ROT (Erwinia carotovora). Reports of damage to 'Norland' were received throughout the shipping season in B.C. (E.F.).

DRY ROT (Fusarium spp.). Affected specimens were received from Edmonton, St. Lina and Vermillion, Alta. (A.W.H.). It was seen in a few lots, mostly in 'Keswick', at bin inspection in Que. (G.E.). F. sambucinum f. 6 caused slight damage in a field at Vernon River, P.E.I. (G.W.A.).

WILTS (Fusarium spp., Verticillium albo-atrum) were found in 16 fields, mostly in 'Kennebec', in the lower Fraser Valley, B.C. Five were rejected (E.F.). Ratings were 4-tr./79 seed fields in n. Alta. and 50-sl./114 in s. Alta. (R.P.B., R.P.S.) and 50% of the fields inspected in Man. showed traces of wilts (D.J.P.). Wilts were more prevalent than usual in the Guelph district (J.W.G.), specimens were received from home gardens in the Ottawa area (J.B.J.) and 3/47 seed fields in e. Ont. showed trace infections (G.E.B.F.). Verticillium wilt increased considerably over 1964 levels in Que. and was most prevalent in 'Kennebec' (G.E.). It was rated 35-tr.-sl./210 fields in N.S. with 3 fields rejected. The cultivars most affected were 'Kennebec', 'Sebago', 'Red Pontiac' and 'Irish Cobbler' (R.C.L.). Wilts were more prevalent than in 1964 in P.E.I. with ratings being 532-sl. 246-mod. 2-sev./4,466 fields inspected (G.C.R.).

GOLDEN NEMATODE (Heterodera rostochiensis) was found in June in a small planting of 'Warba' potatoes on the Saanich Peninsula of Vancouver Island, B.C. Subsequent surveys of approximately 10,000 acres showed about 100 acres to be infested, all in the immediate vicinity of the original infestation. No golden nematodes were found in areas of the mainland surveyed. Surveys are continuing, quarantine measures have been applied and steps to eradicate the nematode have been taken (W.R.O., W.P.C.).

RHIZOCTONIA (Pellicularia filamentosa). Ratings were 121-sl. 96-mod. 9-sev./263 seed fields in B.C. (E.F.). It increased in severity in n. Alta. where it was rated 28-sl. 11-mod./79 fields. In s. Alta. ratings were 91-sl.-mod./114 fields (R.P.B., R.P.S.). Slight infections were seen in 8% of the fields inspected in Man. (D.J.P.) and it was slight in 5/27 bin lots examined in e. Ont. (G.E.B.F.). Incidence increased over 1964 levels in Que. and infections were rated 220-sl. 26-mod. 5-sev./251 seed fields (G.E.). The seedling F5606, now licensed as the cultivar 'Grand Falls' was 90% infected and damage was severe in plots at Les Buissons, Que. (H.G.). Slight infections were noted in N.B. (S.R.C.) and a few severe infections were seen in N.S. (R.C.L.). The stem canker phase of the disease caused moderate yield losses in e. Nfld. (O.A.O.).

LATE BLIGHT (Phytophthora infestans) was seen in a few seed crops on Vancouver Island, B.C. (E.F.) and in 2/47 fields in e. Ont. where infection resulted in slight tuber infection (G.E.B.F.). In Que. it was rated 21-sl. 6-mod./858 fields but it was held in check by weather conditions and the use of top killers. Some tuber rot was found in bin inspections (G.E.). Scattered trace infections were seen in table stock fields throughout Que. (H.G.). It was not found in commercial fields in N.B. (S.R.C.) and incidence was the lowest in 39 years in N.S. where it occurred only in coastal areas (R.C.L., K.A.H.). Traces only were seen in Nfld. (O.A.O.).

BROWN ROT (Pseudomonas solanacearum E.F. Smith). An extensive shipment of potatoes from Bermuda was found to be breaking down on arrival at Halifax, N.S. Temperatures had been high on the wharf at Hamilton and had increased during shipment. Losses, estimated at 10%, were checked as soon as temperatures were reduced (K.A.H.).

LEAK (Pythium ultimum) caused an estimated 35% loss in a field that was wet in late summer at Compton, Que. (L.J.C.), was severe on 'Kennebec' in poorly drained fields at La Pocatière (C.A.) and was seen in 2 lots during bin inspection (G.E.). A

grower-shipper at Hunter River, P. E. I. sustained a considerable loss as a result of digging and grading during unseasonably warm weather. The crop required regrading (J. E. C.).

POWDERY SCAB (Spongospora subterranea). Slight to moderate infections were seen in 4 lots at bin inspection in Que. (G. E.) and slight infections occurred on 'Green Mountain' at La Pocatière (H.G.). Infection was 20% on 'Kennebec' and 7% on 'Avon' in a plot trial in N. S. (R.C.L.).

COMMON SCAB (Streptomyces scabies). Slight infections were seen on all cultivars in central B. C. and the Cariboo region (E.F.). Incidence was lower than usual in n. Alta. but most smooth-skinned cultivars bore slight infections in s. Alta. (R. P. B., R. P. S.). Damage was slight in 4/47 bins examined in e. Ont. (G. E. B. F.). Infection was rated 250-sl. 10-mod. 3-sev. in bin inspections in Que. with infections largely confined to the northeastern portion of the province (G.E.). In plots at La Pocatière, Que. where lime had been applied in previous years, 'Green Mountain', 'Teton', 'Urgenta' and 'Norgleam' had over 50% scab whereas 'Huron', 'Avon', 'Cherokee' and 'Norland' had less than 2% (H. G.). Infection was heavy in a 2-acre field at Jemseg, N.B. (S.R.C.) and at Harbour Center, N. S. (A. A. MacN.). It was generally more prevalent than in 1964 in N.S. (R.C.L.), P. E. I. (G. C. R.) and Nfld. (O. A. O.).

WART (Synchytrium endobioticum). Severe infections in infested soils caused moderate to heavy losses in c. and e. Nfld. June was wet and cool favoring severe infections on early-planted crops. The remainder of the growing season was dry but wart damage was unexpectedly heavy in all but fields planted at the end of June (O. A. O.).

LEAF ROLL (virus). Some current-season infection was seen in the B. C. interior and on Vancouver Island (E. F.). Ratings in Alta. were 61-tr. 9-sl. 2-mod. 3-sev./193 fields (R.P.B., R.P.S.). Infection was slight in 20/47 fields in e. Ont. (G.E.B.F.) and it was found in 197/858 fields in Que. Sixteen seed fields were rejected (G. E.). Leaf roll was the most important virus disease in N. S., affecting 93/210 fields (R. C. L.). Ratings in seed fields in P.E.I. were 304-sl. 13-mod. 72-sev./4,466 (G.C.R.).

MOSAIC (virus) was found in 12/47 fields inspected in e. Ont. (G. E. B. F.) and in 497/858 fields in Que. where it caused the rejection of 102 (G. E.). Trace to slight infections occurred in 77/210 fields in N. S. where 'Fundy' was the cultivar most affected (R. C. L.). Its incidence in P. E. I. was half the level reached in 1964. Ratings were 153-sl. 92-mod. 75-sev./4,466 fields and 43 fields were rejected (G. C. R.).

PURPLE TOP (aster yellows virus) was reported in a number of fields in N. S. (R. C. L.) and was trace-10% in a few fields in P. E. I. where 'Sebago' was more affected than other cultivars (G. C. R.).

SPINDLE TUBER (virus). Slight amounts were seen in 4 plantings of 'Netted Gem' in s. Alta. (R.P.S.). Five seed fields were rejected in Man. (D. J. P.) and one in e. Ont. (G. E. B. F.). It was recorded in 1 field and 3 bin lots in Que. (G.E.) and in 5/210 fields in N.S. (R.C.L.). It was rated 144-sl. 72-mod. 88-sev./4,466 fields in P.E.I. (G.C.R.).

STREAK MOSAIC (virus). The Fredericton seedling, F6151 was severely infected in plots throughout Que. Other seedlings, such as F6027, F6205 and F6223 were also affected and produced tubers with a surface necrosis (H. G.).

WITCHES BROOM (virus). Traces were found in 18/59 fields inspected in the Cariboo district of B. C. but it was virtually absent elsewhere in the province (E. F.). It was seen in 1 field of 'Warba' in s. Alta. (R. P. S.).

BLACK HEART (physiological). Specimens of affected P. E. I. tubers were received from Sydney, N. S. The damage is thought to have occurred in transit (K.A.H.).

FROST INJURY was slight in 12/27 bin lots examined in e. Ont. (G.E.B.F.). Injury was seen in 90% of the bin lots inspected in Que. Average damage was about 5% but was 40-50% in some lots. Most of the injury was the result of an early frost on 25 Sept. and a heavy frost on 6 Oct. The districts most seriously affected were the lower St. Lawrence and Lake St. John (G. E.). Frost injury in plots at La Pocatière, Que. ranged from 1-50% depending on the seedling or cultivar. 'Katahdin' and 'Kennebec' suffered the most injury and crops harvested after 7 Oct. averaged 50% damage (H.G.).

GIANT HILL (genetic) was slight in 5 fields of 'Netted Gem' in s. Alta. (R.P.S.) and was occasionally seen in N. S. (R.C.L.).

INTERNAL BLACK SPOT (physiological) was seen in 2 seed crops in the interior of B. C. (E. F.).

LIGHTNING INJURY killed plants in an oblong patch in a field at Centerville, N. S. (A. A. MacN., K. A. H.).

MAGNESIUM DEFICIENCY was seen in a few fields in Essex Co., Ont. 'Avon' seemed more susceptible to this disorder than did 'Irish Cobbler' or 'Cherokee' (J.R.R.).

STEM STREAK (manganese toxicity) was seen in a number of potato fields in P. E. I. Soil samples from affected fields usually gave a pH reading below 5.0, providing favorable conditions for manganese toxicity (J.E.C.).

SUNBURN. Damage was slight in 18/27 bins examined in e. Ont. (G. E. B. F.). Heavy fall rains in n.e. Que. washed soil from ridges and exposed tubers to light and air. Exposed tubers were damaged by both sunburn and early frost (D.L.).

PUMPKIN

POWDERY MILDEW (Erysiphe cichoracearum) was general on foliage, late in the season, in the Okanagan Valley, B. C. (G.E.W.).

RADISH

DOWNY MILDEW (Peronospora parasitica). Infections were rated 1-tr. 3-sl./7 fields examined in s.w. Que. This disease was first observed in 1962 in the area but had not been seen again until 1965 (T.S., R.C.).

ROOT ROT (Rhizoctonia solani). A trace was found in a field of early radish at Cole Harbour, N.S. (A.A.MacN.).

BACTERIAL LEAF SPOT (Xanthomonas vesicatoria var. raphani). Ratings were 1-tr. 2-sl./7 fields examined in s.w. Que. (T.S., R.C.).

RHUBARB

LEAF SPOT (Ascochyta rhei). Infection was moderate in a nursery at Merrickville, Ont. (A.E.S.). A heavily infected specimen was received from Amherst, N.S. (A.A.MacN.).

ANTHRACNOSE (Colletotrichum erumpens) was reported from Red Deer, Alta. (A.W.H.). A specimen, with reports of heavy infections, was received from Notre Dame du Nord, Temiscamingue Co., Que. (J.B.J.).

RED LEAF (cause unknown). Specimens were received from Castor, Didsbury, Heisler and Vermillion, Alta. At Castor, 25% of the plants were affected (A.W.H.).

RUTABAGA

DOWNY MILDEW (Peronospora parasitica) was severe in almost all fields in L'Islet Co. (D.L.) and moderate infections were seen in L'Islet and Kamouraska Counties, Que. (H.G.). Infection was slight at Berwick and Port Williams, N.S. (A.A.MacN.) and at St. John's West, Nfld. (O.A.O.).

CLUB ROOT (Plasmodiophora brassicae). In loamy soil at St. Eugene, Que., 'Laurentian' showed 40% infection, mostly of secondary roots whereas 'York' was free of disease (H.G.). 'York' showed high resistance in plots at Oromocto, N.B. Some other cultivars were 80% infected (S.R.C.). Club root is a problem in N.S. in areas where successive crops of susceptible plants are grown. Infection is escaped by using a 5-year rotation. 'York' and 'Chignecto' show resistance in most parts of the province although small clubs were found on all 'York' plants at the Research Station, Kentville (A.A.MacN., C.O.G.). 'Laurentian' was slightly affected at Argyle Shore, P.E.I. (G.W.A.).

SKIN SPOT (Rhizoctonia solani) was severe in 1/3 fields examined in Fredericton Junction, N.B. (S.R.C.). Both 'York' and 'Laurentian' had moderate infection at Kentville, N.S. (K.A.H.). The condition was present in most rutabaga fields in P.E.I. The lesions are mostly superficial but they will develop rapidly under poor storage conditions and render roots unsaleable (J.E.C.).

BROWN HEART (boron deficiency) caused severe losses in a 10-acre planting at Chicoutimi (D.L.) and caused slight to moderate damage to 'Laurentian', particularly in loamy soils, at La Pocatière, Que. (H.G.). All roots in a planting at Argyle Shore, P.E.I., in which no boron had been applied with the fertilizer, were severely affected by brown heart and water core (J.E.C.).

DROUGHT. Specimens received from Papineau Co., Que. showed marginal leaf necrosis and accompanying information indicated wilting and eventual death of half the plants in a 3-acre field. Drought conditions were severe at the time (D.W.C.).

SPINACH

DOWNY MILDEW (Peronospora farinosa (Fr.) Fr. = P. spinaciae Laub.). Loss was 40% in May in closely-planted early spinach in a market garden nr. Vancouver, B.C. The rate of infection was probably higher but some of the crop was saved by stripping older, lightly-infected leaves. Later plantings did not seem to be affected (H.N.W.T.). It affected half the plants in a fall-grown crop for processing at Vernon, B.C. (G.E.W.).

SQUASH

DRY ROT (Fusarium roseum). Losses of 'Buttercup' squash were 10% in 2 storages at Port Williams, N.S. 'Hubbard' was unaffected. Most infections originated at the stem-end of the fruit (A.A. MacN.).

LEAF SPOT (Septoria cucurbitacearum). Heavy infections were seen on 'Buttercup' squash in Kings and Lunenburg Counties, N.S. Some early foliage died but the overall crop was not seriously reduced (A.A.MacN., K.A.H.).

SWEET CORN

SMUT (Ustilago maydis). One specimen was received from Moose Jaw, Sask. (R.J.L.), one from L'Acadie, Que. (R.C.) and one from Cardigan, P.E.I. (J.E.C.).

BACTERIAL ROT (pathogen undetermined). A bacterial soft rot involving husks, ears and eventually the stalks was observed at Ladner and Matsqui, B.C. It seemed to be associated with overhead irrigation (H.N.W.T.).

TOMATO

EARLY BLIGHT (Alternaria solani) caused considerable damage to foliage in the Vernon, B.C. area and slight to moderate damage in the more southerly portions of the Okanagan Valley (G.E.W.). A heavily infected specimen was received from Nicolet, Que. (D.L.). It continues to be the most serious disease of tomato in N.B. where infections ranged from trace to 70% in 30/31 fields surveyed. Little fruit rot was found but heavy defoliation greatly reduced yields (S.R.C.). Infections were severe in several fields in Kings Co., N.S. following irrigation. They were moderate to severe on foliage and fruits of 'Quebec 5' and 'Fireball' in Pictou Co. Infections were also

seen in Cumberland, Colchester and Antigonish Counties (A.A.MacN., C.O.G.).

ALTERNARIA ROT (Alternaria tenuis) caused a considerable loss of fruit, especially during the latter part of the picking season, in the Vernon area of B.C. Infection usually took place through growth cracks (G.E.W.).

GRAY MOLD (Botrytis cinerea) was much more prevalent than usual in fall greenhouse crops in s.w. Ont. Damage was extensive where control measures were less than adequate (J.R.R.). Average damage was 5% in 7/13 fields surveyed in N.B. (S.R.C.). Canker caused by gray mold killed 2-5% of the plants in greenhouse plantings in Kings Co., N.S. Fruit losses in field crops were less than 2% (K.A.H., A.A.MacN.).

LEAF MOLD (Cladosporium fulvum) was responsible for some damage in commercial greenhouse crops in the Okanagan Valley, B.C. (G.E.W.). In s.w. Ont., 1965 was the worst year for leaf mold since the introduction of susceptible cultivars into the area. Nearly all fall greenhouse crops of the cultivars 'Ohio WR-7' and 'Ohio WR-25' had trace to severe infections (J.R.R.). Moderate to severe infections were seen in 6 greenhouses at Grand Pré, Falmouth and Clifton, N.S. Damage was difficult to assess but it was estimated losses in the late crop of 'Tuck Queen' were in the vicinity of 15% (A.A.MacN., K.A.H.).

ANTHRACNOSE (Colletotrichum coccodes). Losses from fruit rot were high, late in the season, in the Okanagan Valley, B.C. It occurred throughout the Valley but was more prevalent in the northern than in the southern area (G.E.W.). Dry weather in N.S. suppressed its development but fruit losses of 10 and 20% were recorded at Kentville (K.A.H.).

BACTERIAL CANKER (Corynebacterium michiganense). Breeding material at the Experimental Farm, Morden, Man. had 5% of the plants infected. The pathogen was probably seed-borne (J.A.H., R.Z.). It has been a problem in greenhouse crops in s.w. Ont. for a number of years and its intensity varies greatly from year to year. It was more widespread in 1965 than in the last 20 years, particularly on the 'Ohio' cultivars. A previously unobserved type of fruit symptom was in evidence. Losses of up to 20% were estimated in a few ranges. The source of the inoculum, whether seed or soil, was not determined (C.D.McK., J.R.R.).

LATE BLIGHT (Phytophthora infestans) was seen only as a trace infection in 1/31 fields examined in N.B. (S.R.C.) and none was seen or reported in the 1965 crop in N.S. (K.A.H.)

BUCKEYE ROT (Phytophthora parasitica) was seen in one fall greenhouse crop in s.w. Ont. There was strong evidence of soil splashed on the fruit (J.R.R.).

STEM ROT (Sclerotinia sclerotiorum) caused some damage in commercial greenhouses at Summerland, B.C. (G.E.W.) and trace amounts were seen at Kentville, N.S. (K.A.H.).

LEAF SPOT (Septoria lycopersici). Specimens, with information indicating a severe infection, were received from Taschereau, Abitibi Co., Que. (D.L.).

WILT (Verticillium spp.) occurred throughout the Okanagan Valley, B.C. on strains and cultivars of tomatoes susceptible to V. dahliae (G.E.W.). Traces were seen in a few spring greenhouse crops in s.w. Ont. (C.D.McK.). 'Stokesdale' was 100% infected with V. albo-atrum at the Research Station, Kentville, N.S. The crop was light but wilt symptoms were not too obvious until the stems were cut (K.A.H.).

DOUBLE STREAK (potato virus X and tobacco mosaic virus) was more prevalent than usual in field and greenhouse crops in s.w. Ont. (J.R.R.) and it occurred in a greenhouse crop at Bras d'Or West, N.S. (A.A.MacN., K.A.H.).

MOSAIC (tobacco mosaic virus) was observed in both field and greenhouse crops throughout the Okanagan Valley, B.C. (G.E.W.) and in spring and fall greenhouse crops in s.w. Ont. (J.R.R.). Infection was estimated at 2% in a 5-acre field at St. Cesaire, Que. (R.C.). It was present in all greenhouse crops examined at Grand Pré and Falmouth, N.S. and was responsible for an estimated 10% reduction in crop. Some fruits were also downgraded because of blotchy ripening (K.A.H., A.A.MacN.).

SHOESTRING (cucumber mosaic virus) was present in a few crops in s.w. Ont. (J.R.R.).

BLOSSOM-END ROT (physiological) was less prevalent than usual in Sask. Slight damage only was recorded (R.J.L.). Damage was rated trace-10% in 7/31 fields examined in N.B. (S.R.C.). Its incidence was high in greenhouses in N.S. in May. Reports and specimens from field crops in August indicated up to 20% losses. Some rain and cooler weather in late August checked its further development (K.A.H.). Dry conditions in P.E.I. favored incidence of blossom-end rot (J.E.C.).

BLOTCHY RIPENING (physiological) was quite common in fields in the Montreal, Que. area in 1965 (R.C.).

BORON DEFICIENCY. This deficiency was serious enough to affect the yield and fruit quality in 1 field and 2 greenhouse crops at Kentville and Falmouth, N.S. The diagnosis was confirmed by soil and tissue analyses (K.A.H.).

CHEMICAL INJURY (hormone-type symptoms). Twenty acres of processing tomatoes in s.w. Ont. sprayed from the same supply tank showed hormone injury. Loss of production in the early cultivars was slight but production of later ones, 'Roma' and 'ES-24' was substantially reduced. The mislabeling of a container of insecticide appeared to be to blame (J.R.R.).

GROWTH CRACKS, for the second consecutive year, were more prevalent than normal in s.w. Ont. Fruit, during much of the season, rotted on the vine if not picked within a short time of ripening (J.R.R.). Losses in some N.B. fields were heavy. Up to 40%

loss of marketable fruit occurred in some cases (S.R.C.).

MAGNESIUM DEFICIENCY. Mild symptoms were observed in 2 fall greenhouse crops in s.w. Ont. (C.D. (McK.).

MANGANESE TOXICITY. Moderate to severe injury due to excess manganese was frequently encountered in greenhouse crops in Essex Co., Ont. Tissues analyses showed manganese levels as high as 2500 ppm (J.R.R.).

SMOKE INJURY. Malfunction of the fan on the draft of a coal-fired boiler resulted in severe injury to half of a 1-acre greenhouse planting in s.w. Ont. Severe necrosis of the tops of plants resulted in the loss of 3 to 4 sets of fruit (J.R.R.).

TOP NECROSIS (genetic) occurred in a yield trial of 'Erie Cross BB' at Kentville, N.S. late in the season. This is a prominent necrosis that is easily recognized and it affects the late yield of this cultivar (K.A.H.).

DISEASES OF FRUIT CROPS

A. Pome Fruits

APPLE

COTTONY MOLD (Alternaria spp.). The term, cottony mold, refers to a superficial mold growth over fruit, containers and walls of cold storages where humidity is high. The main organisms involved are species of Alternaria. No damage is done to the fruit but cleaning is difficult and is impossible at the stem and blossom ends. The condition is present in many new cold storages and was observed in 1965 at Oliver and Osoyoos, B. C. (L.E.L.).

FRUIT SPOTTING (Alternaria sp.) caused heavy damage in 1 grower's crop in storage at Osoyoos, B.C. Lesions were black and about $\frac{1}{4}$ inch in diameter. A species of Alternaria could be recovered from the underside of skin lesions (L.E.L.).

BLACK MOLD (Aureobasidium pullulans (de Bary) Arn. = Pullularia pullulans (de Bary) Berkh.). Specimens received from St. Hilaire, Que. had a superficial black mold which was confined to the stem end of the fruit. At the stage when the fruit was examined there appeared to be no rotting of the fruit but the stems separated easily and the fruit was rendered unsightly. The fungus was determined by S.J. Hughes (P.K.B.).

FROG-EYE LEAF SPOT (Botryosphaeria obtusa) caused considerable spotting on 'Idared' in an orchard nr. Harrow, Ont. The orchard had been heavily damaged by fire blight in 1964 (C.D.McK.).

STORAGE ROT (Botrytis cinerea) was found affecting 'Red Delicious', 'McIntosh' and 'Newtown' in 3 packing houses at Kelowna, B. C. Most of the rot was centered around the blossom and stem ends but some fruits were completely rotted by the end of 1964. This condition has apparently been present for some years but since no surface mycelium or spores are produced the inspectors have been recording it as 'storage breakdown'. It was also seen in 'Delicious' from controlled atmosphere storage at Oliver, B. C. in May. Lenticel spotting was evident and some fruits were completely rotted. Incidence was low (L.E.L.).

CANKER (Cytospora sp.). Specimens were received from Two Hills and from Three Hills, Alta. (A.W.H.).

FIRE BLIGHT (Erwinia amylovora). Infections in current season's shoots and in blossoms were found in small numbers in several orchards in the Okanagan Valley, B. C. Damage in 1965 was negligible (D.L.McI.). It was prevalent in the Edmonton district and was reported from 17 other localities in Alta. (A.W.H.). Fire blight infections were general on apple and crabapple in Saskatoon, Sask. (R.J.L.) and its incidence in Man. was low, judging from the low number of specimens received for identification (W.A.F.H.). It developed rapidly in early June in Essex Co., Ont. but progressed slowly thereafter. Its incidence was much lower than in 1963 and 1964 (J.R.C.). Fire blight recurred in s.w. Que. in 1965. At Franklin Center, Huntingdon Co., it was found on 'Astrakhan', 'Lobo', 'Northern Spy', 'Cortland', 'Yellow Transparent' and 'McIntosh'. At St. Grégoire, Iberville Co., 200 young trees of 'Quinte' were severely affected (R.D.). Damage was severe in a small orchard at St. Hilarion, Charlevoix Co., Que. (D.L.).

STORAGE ROT (Gloeosporium spp.). G. perennans caused a blossom-end rot, early in the storage season, on 'Newtown' at Summerland, B.C. Typical bull's-eye rot symptoms developed later but incidence was much lower than usual (L.E.L.). Losses from storage rots in Dec. 1964 were 10% at Coldbrook, N.S. Gloeosporium album was responsible for 40% of the rots and G. malicorticis for 20% (C.L.L.).

CORAL CANKER (Nectria cinnabarina) was responsible for moderate die-back of new growth of 'Rome Beauty' at Morristown and 'Gano' at Sheffield Mills, N.S. The organism appeared to infect through the previous season's fruit scars (R.G.R.).

EUROPEAN CANKER (Nectria galligena) was severe at Westbank and Penticton, B. C. At Westbank, 40 trees, mostly 'McIntosh', had to be removed from one orchard (L.E.L.). Damage was light in 7/67 orchards visited in N. B. (S.R.C.).

PERENNIAL CANKER (Neofabraea perennans). Extension of existing cankers was 2-4 times normal in the Okanagan Valley, B. C. in 1965 and development persisted much later into the summer. Many cankers were treated too soon and spores were pro-

duced under the protective paint. At Kelowna there was a very heavy canker development in young 7-year-old 'Golden Delicious' trees. All infections originated at pruning stubs (L.E.L.).

COLLAR ROT (Phytophthora cactorum) caused the death of trees in several orchards in the Okanagan Valley, B. C. In a planting of 318 4 to 7-year old trees at Summerland, 30% were infected and 66 trees, or 21% had to be removed. The rootstocks infected were either 'E. M. II' or M. M. 104' (D.L.McI.).

POWDERY MILDEW (Podosphaera leucotricha) was moderate in home plantings in the Vancouver, B.C. area (H.N.W.T.). It was present on the foliage of susceptible cultivars throughout the interior of B.C. but infections were much less in evidence than in the past several years. Its low intensity is attributed to the reduction in inoculum following low winter temperatures (D.L.McI.). Infections were light but were a nuisance in several orchards in Essex Co., Ont. (J.R.C.). A specimen was received from St. Catharines, Ont. where it was reported to be heavy on McIntosh. Cleistothecia were abundant on the specimen (D.W.C.).

SCAB (Venturia inaequalis) was present in several B.C. fruit growing districts but was adequately controlled where appropriate control measures were applied (D.L.McI.). It was reported from St. Paul and the Edmonton area (A.W.H.) and was moderate on the crabapple 'Royalty' in a nursery at Calgary, Alta. (F.R.H.). There were scattered sepal infections on 'Red Delicious' in several orchards in Essex Co., Ont. Grade-out was no more than 3% in the orchards (J.R.C.). Despite unfavorable conditions for scab infection in s.w. Que., the lack of or poor timing of sprays resulted in the disease being more widespread than in 1964. By the end of June, leaf scab, and to a lesser extent, fruit scab, appeared in every district. Applications of dodine gave good control and by the end of the season most orchards were "commercially clean". Some orchards, however, around Farnham had 5-80% scabby fruits. Isolated cases of pin point scab were observed (R.D.). Traces of infection were found in 17/61 orchards visited in N.B. (S.R.C.) and the disease was well controlled in N.S. (R.G.R.).

FLAT LIMB (virus). In one orchard in Essex Co., Ont., 60-70 5-year-old trees of 'Idared' in 2 rows showed flat limb symptoms. Six-year-old trees of the same variety were not affected (J.R.C.).

LEAF PUCKER (virus). Foliage symptoms in 'McIntosh' were severe in all affected orchards in the Okanagan and Similkameen valleys in B.C. Fruit symptoms were moderate to severe at Summerland and mild at Cawston. Full bloom of 'McIntosh' was on 14 May and the heat units for the period 15-20 May at Summerland totalled 345 compared to the 23-year average of 900. This is further evidence that cool weather at this season intensified the severity of symptoms (M.F.W.).

RING RUSSETING (virus). In most seasons the severity of fruit symptoms on 'Newtown' has been comparable in all parts of the Okanagan Valley, B.C. In 1965 symptoms were moderate to severe from Penticton south and very mild to mild north of Penticton. Full bloom at Summerland was on 18 May and it was 4-6 days earlier in the southern districts. Heat units were low from 15-20 May and high between 21 and 26 May. The lower heat units during full bloom in the southern areas could have brought on the more severe symptom expression there (M.F.W.).

STEM PITTING (virus). In an experimental planting of 'Virginia Crab' trees on commercial apple seedling stocks at Summerland, B. C., a high proportion of the trees indexing 'Malling IX' displayed severe pitting of wood tissue in the rootstock portions of the trees. Most of these displayed stem pitting symptoms in the 'Virginia Crab' position also, but some trees had wood pitting of the rootstocks only. Most affected trees suffered severe loss of vigor (M.F.W.).

RUBBERY GROWTH (?virus). Typical symptoms of rubbery growth were observed in one large limb of a 'Delicious' tree at East Kelowna, B. C. Symptoms have not previously been found in commercial apple cultivars in B. C. and this may be an indication that severe strains of the virus can affect 'Delicious' (M.F.W.).

BITTER PIT (physiological) caused 10-25% losses in a 70-acre planting of 'Spartan' and 'Delicious' in the Okanagan Valley, B. C. The orchard suffers annually from the disorder and losses in 1965 were heavy, particularly in stored fruit. The portion of the orchard higher up on the "bench" was not affected so severely. Calcium sprays are to be used in an attempt to reduce the incidence of the disorder (J. M.W.).

BORON DEFICIENCY. In specimens received from Two Mountains Co., Que., drought spot and internal cork were moderate on 'Melba', 'Fameuse' and 'McIntosh' and severe on 'Duchess' and 'Yellow Transparent' (R.C.).

FRUIT DEFORMITY (low-temperature injury). There were many abnormalities in apple fruits of the 1965 crop in the Okanagan Valley, B. C., most of which can be attributed to tree damage sustained during subzero weather in December, 1964 and heavy spring frosts in March. At Salmon Arm, many 'Delicious' fruits were severely deformed at the calyx end with fluting extending toward the stem end. Milder fruit deformities occurred on 'Delicious' in other northern districts. In most parts of the region 'Delicious', 'Winesap', and occasionally other cultivars bore numerous tiny fruits with swollen stems. In districts from Summerland north, most cultivars bore many fruits that developed sunken, pigmented areas underlaid by necrotic flesh. This varied from symptoms indistinguishable from bitter pit to sunken rings encircling the fruits near the calyx ends. This symptom occurred on 'Spartan' in only one orchard,

at East Kelowna, and was confined to trees showing a bark cankering symptom suspected to have a virus etiology. In many orchards a large proportion of 'McIntosh' fruits were abnormally long, sometimes flattened on one side. In at least one orchard, at East Kelowna, this abnormal shape was accentuated on fruits from king blossoms (M.F.W.). Similar deformities were observed and described on a number of cultivars at Collingwood, Ont. They, too, were attributed to low-temperature effects. Fruit deformities were also reported from N. B. and N. S. (see Davidson, T. R. and W. R. Allen. Can. Plant Dis. Surv. 46: 7. 1966.) (D.W.C.).

CALYX-END ROT (cause undetermined) was seen in 3/11 orchards examined at Prince William and Gagetown, N. B. (S. R. C.). A calyx-end rot caused by Sclerotinia sclerotiorum has been frequently reported from N. S. (D.W.C.).

INTERNAL BROWNING (low-temperature injury). Low temperatures in Oct. caused discoloration and early breakdown of 'Cortland' apples from Prince William and Gagetown, N.B. Some fruits showed discoloration while still on the trees and losses in storage were considerable (S.R.C.).

IRON DEFICIENCY was responsible for chlorosis in crabapple trees in Sask. The application of iron chelates usually results in improved vigor in this area (R.J.L.).

MAGNESIUM DEFICIENCY. Dry conditions in 1965 accentuated this condition in N.B. Leaf scorch, reduction in fruit size and fruit drop were observed in 11/17 orchards visited (S.R.C.).

WINTER INJURY. There was considerable killing of the more tender cultivars following subzero temperatures in December, 1964 in the Okanagan Valley, B.C. The 1965 crop was reduced by one million bushels. A number of breakdown conditions in storage were assessed as secondary results of winter injury (M.F.W.). Severe injury was seen in a young orchard of 'Delicious' at Burton, N.B. Internal wood had turned brown and there was considerable die-back of twigs and leaders. Bark splitting was seen in an orchard at Prince William (S.R.C.).

SCALY BARK (cause undetermined) caused some damage on 'Red Delicious' in 3 orchards in Essex Co., Ont. Many trees that showed symptoms in 1964 appeared to be recovering in 1965 (S.R.C.).

PEAR

FIRE BLIGHT (Erwinia amylovora) reached moderate levels in districts of the Okanagan Valley, B.C. where it had occurred in 1964 but other districts were relatively free of the disease (M.F.W.). Specimens, with reports of heavy infection, were received from Peace River, Alta. (A.W.H.). Only scattered trees of 'Bartlett' were infected in a number of orchards in Essex Co., Ont. Incidence was much lower than in 1963 and 1964 (J.R.C.).

BULL'S-EYE ROT (Gloeosporium perennans) was severe on fruits from controlled atmosphere storage tests at Summerland. It was not encountered in pears held in common storage in the area (L.E.L.).

TRELLIS RUST (Gymnosporangium fuscum). The infestation at Chilliwack, B. C., the only one known on the mainland of Canada, appears to have been eradicated. On the other hand, the amount of infection in the Oak Bay district of Vancouver Island was nearly double that of 1964. It was also observed in the adjacent areas of Victoria, Esquimalt and Ten Mile Point (W.R.F.).

BLOSSOM AND TWIG BLIGHT (Monilinia laxa) was severe on 2/65 trees on the Experimental Farm, Saanichton, B. C. The pathogen was readily isolated from blossom peduncles, leaf petioles and fruit spurs (R.G.A.).

SCAB (Venturia pirina). Specimens bearing moderate infections were received from 2 Vancouver, B. C. gardens (H.N.W.T.). Infections were trace at Keswick, N. B. (S.R.C.).

FRECKLE PIT (virus). Moderate symptoms were observed on 'Anjou' pears in the Okanagan Valley, B. C. (J.M.W.).

STONY PIT (virus). Mild symptoms were observed on scattered trees of 'Anjou' and 'Bosc' throughout the Okanagan Valley, B.C. Fruit from infected trees is mostly unmarketable. Severity of symptoms varies from year to year in individual trees (J.M.W.).

ANJOU PIT (cause unknown) caused moderate damage where present in the Okanagan Valley, B. C. Because of the light crop many growers reduced the amount of irrigation water. This resulted in periodic dry periods in these orchards, a condition that seemed to be correlated with the incidence of Anjou pit. It also seemed to be favored by the larger fruits produced in 1965 (J.M.W.).

CHEMICAL INJURY (2,4-D or MCPA) was seen on 'Clapp's Favorite' at Blomidon, N.S. The sprayer had been used for weed control in grain and later in the orchard. Leaf petioles were twisted and new growth was stunted. The crop of 10 trees was lost (R.G.R.).

B. Stone Fruits

CHERRY

CROWN GALL (Agrobacterium tumefaciens). Large galls were found on old sweet cherry trees at various locations throughout the St. Catharines district, Ont. They did not appear to cause much damage as the trees were all 30-50 years old (T.R.D.).

BLACK KNOT (Apiosporina morbosa) was common on wild and cultivated cherry trees in Que. (D.L.). Twenty-four 'Montmorency' trees were infected in a nursery at Ste. Foy, Que. (J.R.).

LEAF SPOT (Higginsia hiemalis). A 10% infection was noted at Moncton, N. B. (S.R.C.).

POWDERY MILDEW (Podosphaera clandestina) was observed on terminal leaves of most of the new growth of a sour cherry tree at Summerland, B.C. It was probably general throughout the Okanagan Valley (G.E.W.).

BACTERIAL CANKER (Pseudomonas mors-prunorum). Slight infections were found on sweet cherry in an orchard at Kentville and in one at Avonport, N.S. The identity of the pathogen was confirmed by workers in Great Britain (C.O.G.). This is the first authentic record of the presence of P. mors-prunorum in North America (see Gourley, C.O. Can. Plant Dis. Surv. 45: 101-102. 1965.) (D.W.C.).

SHOT HOLE (Pseudomonas syringae) was found in trace amounts on sour cherry at Kentville, N. S. (C.O.G.).

CORYNEUM BLIGHT (Stigmina carpophila) affected a small percentage of sweet cherry fruits at Creston, B. C. (D.L.McI.).

LITTLE CHERRY (virus). Symptoms on all sweet cherry cultivars were severe in the Kootenay Valleys, B.C. Four seedlings showing some resistance have been selected from a breeding program for propagation and limited distribution (J.M.W.).

NECROTIC RING SPOT (virus) continues to spread very rapidly in the Niagara Peninsula, Ont. in sour cherry orchards that are over 4 years of age and that have 5-10% of the trees infected. The distance between new plantings and older diseased trees is all-important in the initial stage. Three sour cherry orchards have been studied in detail since they were planted in 1953. One of these, with old diseased trees along one side had 8% of the new trees infected by 1956 and, after 6 years of rapid virus spread, was 95% infected by 1962. This orchard had passed the initial stage of virus build-up by the time it was 3 years old. The other two orchards with isolation of 75 yards from older diseased trees did not reach this crucial stage until 1961, at 8 years of age. By 1965 infection in the two orchards was 85 and 68% with 37 and 33%, respectively, of the spread recorded in 1965 (T.R.D.).

YELLOWS (virus). Leaf drop caused by sour cherry yellows was less severe in the Niagara Peninsula, Ont. in 1965 than normal because of the cool, late spring. The peak drop occurred between 25-30 June, a week later than normal. In some orchards yellowed leaves were still seen as late as 22 July (T.R.D.).

WINTER INJURY was responsible for considerable injury to or killing of cherry trees in the Okanagan Valley, B.C. (M.F.W.). Many sweet cherry trees planted in 1963 and 1964 in the Niagara Peninsula, Ont. were severely damaged or killed by low temperatures during the winter of 1963-1964. The effects, gradual wilting and death of the trees, were not manifest until mid-July. In some cases, sunken areas under the bark were observed. These "cankers" often exuded gum through cracks in the bark. Roots were not affected. The greatest amount of injury occurred on the sunny side of the trunk and main branches and, as a rule, relatively few trees were affected in any given orchard. In one orchard of over 200 trees, however, the condition was accentuated by excessive fertilization and over one-third of the trees were dead and others were injured. The crop for at least 7 years prior to the planting of cherries was heavily fertilized. There is a danger that further extensive injury will occur in this orchard before the effects of heavy fertilization can be overcome (T.R.D.).

PEACH

CROWN GALL (Agrobacterium tumefaciens). Large galls were occasionally seen on old peach trees in the St. Catharines, Ont. district (T.R.D.).

BROWN ROT (Monilinia fructicola) was severe in a home garden in the Vancouver, B.C. area. Fruit loss was 90% but no protective sprays had been applied (H.N.W.T.).

LEAF CURL (Taphrina deformans). Frequent inquiries about this disease were received from home gardeners in the Vancouver, B.C. area (H.N.W.T.). Its incidence, induced by brief but heavy rains in April, was high in the Okanagan Valley, B. C. (M.F.W.). Trace infections were present on an unsprayed tree in a garden at Kentville, N. S. (K.A.H.).

WILT (Verticillium dahliae) was observed in a number of orchards in s. w. Ont. Incidence was 30% in a 3-acre block of 5-year-old 'Kelhaven'; it was 8% in a 4-year-old orchard of 'Elberta' and ranged from 1-19% in 4 varieties in a 4-year-old planting at Kingsville (C.D.McK.).

BACTERIAL SPOT (Xanthomonas pruni) caused slight damage on 'Kelhaven' in Essex Co., Ont. (J.R.C.) and trace infections were seen on peach foliage at Kentville, N. S. (C.O.G.).

WINTER INJURY caused a heavy loss of trees in the Okanagan Valley, B.C. There was no commercial crop in 1965 (M.F.W.). Trees were severely affected in Kings and Annapolis Counties, N.S. during the winter of 1964-65. Fruit buds were completely killed in all parts of Annapolis County and trees were 3 weeks later than normal in leafing out in most areas (C.O.G.).

PLUM

CROWN GALL (Agrobacterium tumefaciens). A number of old trees, 50-55 years old, at Queenston, Ont. had numerous galls on the lower trunk and upwards to 5 feet above the ground. Some galls were old and others obviously still growing (T.R.D.).

BLACK KNOT (Apiosporina morbosa) was present on many farms in the lower Fraser Valley, B.C. Little pruning is done and spraying for control is not practiced (H.N.W.T.). A specimen was received from St. Romuald, Que. (D.L.). It is very common and troublesome on home garden trees in N.B. Many

native Prunus trees are severely infected (S.R.C.). Black knot was general throughout N. S. on uncared for trees. Wild Prunus carried heavy infections in most areas (C.O.G.). Infection was slight on 'Mount Royal' plum at Charlottetown, P.E.I. Dry weather in both 1964 and 1965 kept levels of infection in the province low (G.W.A.). It was also light at Freetown, P.E.I. (J.E.C.).

BROWN ROT (Monilinia fructicola). Infection was heavy in a home garden at Vancouver, B. C. (H.N.W.T.).

POWDERY MILDEW (Podosphaera clandestina). A specimen was received from Giffard, Que. (D.L.).

PLUM POCKETS (Taphrina communis). Specimens showing a slight infection were received from Moose Jaw, Sask. (R.J.L.). The disease was very prevalent in the Interlake region of Man. (W.C.McD.). Specimens were received from Chicoutimi, Que. (D.L.) and all fruits of a Japanese plum tree at Bangs Falls, Queens Co., N.S. were affected (A.A.MacN.).

SHOT HOLE (Xanthomonas pruni). Trace infections were seen on plum foliage at Kentville, N. S. (C.O.G.)

C. Ribes Fruits

CURRANT

BLISTER RUST (Cronartium ribicola) was found on red and black currants in 8 nurseries in Que. Seventy-four infected plants were destroyed (J.R.). Infection was heavy on currants at Brown's Flats, N.B. (S.R.C.) and black currants at Port Blandford in the Bonavista Bay district of Nfld. were 100% infected (O.A.O.).

CLUSTER CUP RUST (Puccinia caricina) was recorded on black currants in a home garden at Gimli, Man. (W.C.McD.).

POWDERY MILDEW (Sphaerotheca mors-uvae). Specimens of black currant bearing cleistothecia were received from Penticton and it was observed on the same host at Summerland, B.C. (G.E.W.). Infected specimens of currants were received from Calgary, Flatbush, Ponoka, Castor and Red Deer, Alta. Those from the last two localities were 100% infected (A.W.H.).

D. Rubus Fruits

BLACKBERRY

CANE AND LEAF RUST (Kuehneola uredinis). Slight infections were seen on the cut-leaf trailing blackberry, Rubus laciniatus, at Royal Oak, B. C. (W.R.O.).

RASPBERRY

GRAY MOLD (Botrytis cinerea) was seen on raspberries at Bon Accord, Alta. (A.W.H.). Gray mold wilt caused damage in plantings at St. Raphael, Bellechasse Co. and at St. Antoine de Tilly and Fortierville, Lotbiniere Co., Que. (D.L.).

SPUR BLIGHT (Didymella applanata). Specimens were received from Lac la Biche, Rolling Hills, Winterburn, Ponoka, Ellerslie and Wetaskiwin, Alta. At Wetaskiwin one-half of the planting was affected (A.W.H.). Infection was rated 40% in 1/8 plantings examined at Perth, N. B. (S.R.C.).

ANTHRACNOSE (Elsinoë veneta) caused slight damage in a garden at St. Pie, Bagot Co., Que. (R.C.) and was troublesome in home garden plantings in N.B. (S.R.C.).

YELLOW RUST (Phragmidium rubi-idaei). A specimen was received from Lotbiniere, Que. (D.L.).

BACTERIAL TIP BLIGHT (? Pseudomonas syringae) occurred as a minor disease in 4 plantings at Peardonville, nr. Abbotsford, B.C. The tips and some young lateral growth were attacked and the symptoms resembled those caused by Ps. syringae on lilac. A similar condition was seen in the area in 1964 (H.S.P.).

POWDERY MILDEW (Sphaerotheca macularis) was observed at Crossfield, Alta. (A.W.H.) and was severe at Deschambault, Que. in Sept. (D.L.).

LEAF CURL (virus) affected 50% of a planting at Lac la Biche, Alta. (A.W.H.) and 8% of a planting at Sussex, N. B. (S.R.C.).

MOSAIC (virus) was reported from Byemoor, Alta. (A.W.H.) and infections ranged from tr. -40% in 7/8 plantings examined in N. B. (S. R. C.).

WINTER INJURY. Some damage to raspberries was caused by unusually low temperatures at the B.C. coast in December, 1964 (H.N.W.T.). Damage was heavy in all districts of N. B. (S.R.C.).

E. Other Fruits

BLUEBERRY

CROWN GALL AND CANE GALL (Agrobacterium tumefaciens, A. rubi). There was a sudden increase in the incidence of both diseases in B. C. following extreme low temperatures in December, 1964 (W.R.F.). Crown gall was severe in a large planting at Pitt Meadows, B. C. where the grower had neglected to prune out previously diseased canes. Nearly 30% of all canes had to be removed (H.S.P.).

RED LEAF (Exobasidium vaccinii). About 1% of the plants were infected in a lowbush field at Berwick, N.S. (C.L.L.). Heavy infections, damaging about 4% of the plants, occurred at the Blueberry Substation, Avondale, Nfld. Disease incidence was considerably greater than in 1964 (O. A. O.).

CANKER (Godronia cassandrae Pk. f. vaccinii Groves) (See Groves, J. W. Can. J. Bot. 43: 1195-1276. 1965). Canker was present in most highbush blueberry plantings in peat soils in the lower Fraser Valley, B.C. Fewer infected canes died than in 1964, probably reflecting a greater availability of moisture (H.N.W.T.). The amount of infection observed at Kentville, N. S. was as follows: on 'Johnson', 14%; 'Berkeley', 10%; 'Bluecrop', 3. 3%; 'Burlington', 10% and 'Coville', 1.6% (C.L.L.).

POWDERY MILDEW (Microsphaera penicillata var. vaccinii). Infection was rated at 5% in lowbush blueberries at Coldbrook, N. S. (C.L.L.).

BLOSSOM BLIGHT (Monilinia vaccinii-corymbosi) affected about 15% of the blossom trusses and the leaves thereon in a 3-acre planting of highbush blueberries at Pitt Meadows, B. C. (H.N.W.T.).

WITCHES' BROOM (Pucciniastrum goeppertianum). Infection was light on native blueberries at Avondale, Nfld. (O.A.O.).

FASCIATION (? genetic). One twisted highbush blueberry cane with typical striated, straplike appearance at its base was seen at Vancouver, B. C. Other bushes in the same planting were said to be normal (H. N. W. T.).

FROST DAMAGE. A mid-June frost damaged fruits of a certain size on early-maturing highbush cultivars at Pitt Meadows, B. C. By 7 July sectors of less than 180° of nearly ripe fruits were withered and had a tendency to drop when touched. Loss of fruit was about 10% (H.N.W.T.).

GRAPE

CROWN GALL (Agrobacterium tumefaciens) was locally severe in several vineyards in the Okanagan Valley, B.C. Infections of up to 35% were seen. Circumstantial evidence indicated that the preceding severe winter was responsible for the sudden increase in the number of affected vines and the amount of damage (A.J.H.). Two vines in an experimental planting at Gaspereaux, Kings Co., N. S. were killed by crown gall (C.O.G.).

ANTHRACNOSE (Elsinoë ampelina). Trace infections were seen at Gaspereaux, Kings Co., N. S. (C.O.G.).

STEM AND ROOT GIRDLING (Roesleria ?hypogaea Thüm & Pass.) was found in 3 vineyards in the Niagara Peninsula, Ont. Affected vines showed a gradual decline in vigor and a sudden collapse and death as a result of girdling of the underground stem or death of the larger roots. It was confined to spots in wet, heavy soils and there was evidence of spreading. A species of Roesleria was found fruiting on all dead stems and roots. Its pathogenicity is as yet untested (H.F.D.).

DAGGER NEMATODES (Xiphinema spp.). X. americanum Cobb was found in all soil samples examined from vineyards in the Niagara Peninsula, Ont. but X. index Thorne & Allen, the vector of soil-borne grape viruses, was not found (H.F.D.).

FANLEAF (virus). Growth from roots of winter-injured grapevines in the Okanagan Valley, B.C. showed unusually distinct symptoms of fanleaf and other viruses (M.F.W.). In the Niagara Peninsula, Ont., fanleaf-like symptoms were observed in some vines of 'Agawam', 'Delaware', 'Elvira', 'Pinot Chardonnay', 'Seibel 10878' and 'Seibel 14660'. Characteristic symptoms were also seen in some plants of the imported rootstock, Vitis riparia x rupestris '3309'. Fanleaf virus was recovered from 2/62 vines of '3309' but not from the other cultivars tested (H.F.C.).

OTHER VIRUS DISEASES. Leafroll symptoms were frequently observed in 'Veeport' in the Niagara Peninsula, Ont. but the extent of involvement of the leafroll virus is not yet known. No symptoms of Pierce's disease, yellow mosaic, yellow vein or corky bark were seen in the vineyards surveyed (H.F.D.).

WINTER INJURY. Many mature vines were killed to ground level in the Okanagan Valley, B.C. but, as most plantings were self-rooted, they regenerated. 1965 crops, however, were eliminated or greatly reduced (M.F.W.).

STRAWBERRY

GRAY MOLD (Botrytis cinerea) was found in 31/42 plantings examined in N. B. but in only 2 was it severe. Dry weather kept infections in check (S.R.C.). It was extremely rare in Kings Co., N.S. in 1965 and infection never exceeded 1% (C.O.G.).

LEAF SCORCH (Diplocarpon earliana). Infections ranged from 5-20% in plots at L'Assomption, Que. (R. C.). Traces were found in 3/30 fields examined at Gagetown, N. B. (S.R.C.) and no infections were seen in Kings Co., N. S. (C.O.G.).

LEAF BLOTCH (Gnomonia fructicola). Trace infections were seen on 'Redcoat' at Kentville, N. S. (C.O.G.).

LEAF SPOT (Mycosphaerella fragariae). Extensive infections occurred at Viking, Alta. (A.W.H.). Infection was general throughout N. B. and was severe on 'Cavalier'. Little infection was seen in May and June (S.R.C.). Dry weather in N. S. kept infection at a very low level (C.O.G.).

RED STELE (Phytophthora fragariae). Infections in B. C. plantings that survived the low winter temperatures were not significant (H.N.W.T.). Severe infections in spacing trials at Kentville, N.S. destroyed 40% of the plants of 'Redcoat' (C.L.L.).

POWDERY MILDEW (Sphaerotheca macularis). Specimens showing light infections were received from Pincher Creek, Alta. (P.E.B.). Powdery mildew was general in 4 nurseries surveyed in Kings Co., N. S. and in 2 nurseries 'Cavalier', 'Surecrop' and 'Grenadier' were severely infected (C. L. L., A. A. MacN.). It caused considerable damage to 'Senator Dunlop' at Mount Stewart, P. E. I. (G.W.A.).

WILT (Verticillium dahliae) caused minor damage in a planting at Gagetown, N.B. (S.R.C.). It was found in only 3 areas of Kings and Lunenburg Counties, N. S. Based on the season's observations 'Catskill' and 'Senga Sengana' were resistant to wilt; 'Sparkle', 'Talisman', 'Red Gauntlet', 'Surecrop' and 'Cavalier' were intermediate and 'Guardsman', 'Redcoat', 'Acadia' and 'Ozark Beauty' were susceptible (A.A.MacN., C.O.G.).

CRINKLE (virus). Trace infections were seen in 'Sparkle' at Cambridge, N.S. (C.L.L.).

GREEN PETAL (virus). A field at Ste. Louise, L'Islet Co., Que. had 15% of the plants infected. Damage was slight to moderate. Infection was severe in a 1-acre field in Bellechasse Co. (H.G.). Infections ranging from trace-50% were seen in 7/40 fields examined in N.B. (S.R.C.). A survey in N. S. of 8 commercial fields involving 24 acres revealed the presence of green petal as follows: 10% infection in 17 acres of 'Sparkle', 18.9% infection in 2.5 acres of 'Surecrop', 8% infection in 1.5 acres of 'Guardsman', 1% infection in 0.2 acres of 'Catskill' and no infection in 3.5 acres of 'Cavalier' (C.L.L., A.A.MacN.). Infections were general in 'Sparkle', 'Acadia', 'Catskill', 'Redcoat' and 'Senator Dunlop' throughout P.E.I. The heaviest infections were in 'Sparkle' (C.B.W.).

LEAF ROLL (virus). Infection averaged 0.6% in 17 acres of 'Sparkle' examined in N.S. in June. None was found in 7 acres of 4 other cultivars. In Oct. trace infections were seen in a 5-acre field of 'Sparkle' and 1% infection in a 2-acre field of 'Cavalier' in Kings Co. (C.L.L., A.A.MacN.).

WITCHES' BROOM (virus). Trace amounts were seen in 'Sparkle' at Morristown, N.S. (C.L.L., H.S.).

CHEMICAL INJURY. A slight yellow mottling of leaf margins at Digby Neck, N. S. was attributed to injury from the herbicide, simazine (A.A.MacN.).

POTASSIUM DEFICIENCY was responsible for a marginal necrosis on outer leaves in a field at Morristown, N. S. (A.A.MacN.).

WINTER INJURY. Extremely low temperatures in mid-December, 1964 caused heavy losses of plants at the B. C. coast and in the lower Fraser Valley. It was necessary to replant large acreages (H.N.W.T.). The absence of snow cover in Que. during the winter of 1964-65 resulted in the loss of nearly 2 million certified plants out of a total of $5\frac{1}{2}$ million produced in the provincial certification program. Fruit production in 1965 was reduced by 35-40% (J.R.).

STORAGE MOLD (various organisms) caused plant losses averaging 1.8% in 840,000 plants in 4 cold storages in N.S. In one storage, where temperatures fluctuated widely, the loss was 25% of 43,000 plants (C.L.L., A.A.MacN.). Breakdown was severe in one storage at Fredericton, N.B. (S.R.C.).

DISEASES OF TREES AND SHRUBS*

ACER - Maple

ANTHRACNOSE (Gloeosporium apocryptum) was severe on 225 maples in a nursery at Manotick, moderate on 40 trees of A. ginnala in a nursery at Osgood and was moderate, associated with drought injury on 3 trees in a home planting at L'Orignal, Ont. (A.E.S.). Affected specimens were received from St. Fabien, Rimouski Co., Que. (D.L.).

CORAL CANKER (Nectria cinnabarina). Twenty-five trees of a 90-tree consignment of A. saccharinum var. laciniata that entered Canada from Belgium in 1965 were dead or dying from canker infection in a nursery at Galt, Ont. (A.E.S.). Damage to A. rubrum was moderate to severe at Cornerbrook (J.H.) and 10% of the trees of A. platanoides on a property at St. John's, Nfld. were affected (O.A.O.).

LEAF SPOT (Phleospora platanoidis Petr.) affected all the foliage of a planting of young A. platanoides at Grand Pré Park, N.S. (C.O.G.).

TAR SPOT (Rhytisma spp.). R. punctatum affected maples at Ponoka, Alta. and R. acerinum caused slight infections on A. saccharinum in a nursery at Bromptonville, Richmond Co., Que. (J.R.).

DETERIORATION (adverse environmental conditions). This condition, caused by a number of factors, was generally less conspicuous in southern Ontario in 1965 than in recent years but the percentage of trees affected remains high, particularly along hard-surfaced roads (B.W.D.). Winter conditions and severe drought periods early in the season in Que. probably accounted for the rapid deterioration and death of maple trees along Route 2 from Trois Rivières to Quebec City and from Quebec City to Rivière du Loup as well as along Route 3 from Quebec City to Nicolet (G.B.O.). Sugar maples in L'Islet village were dying out but the cause is as yet undetermined (H.G.). A die-back of red and sugar maples was general throughout P.E.I. and was also observed in N.S. (J.E.C.).

FROST INJURY. Winter frosts were probably responsible for the root mortality observed on several dying maple trees at Charny and St. Nicholas, Lévis Co., Que. Late spring frosts also caused considerable injury to maple foliage in many districts. Other trees and shrubs, particularly Lombardy poplar, Japanese barberry and snowberry were severely injured. Root mortality also occurred in ornamental apple, oak and elm trees (G.B.O.).

LEAF SCORCH (cause unknown). This physiogenic condition was prevalent on shade and roadside trees, especially sugar maple, in most districts of southern Ontario. Other deciduous trees affected were elm, beech and basswood (B.W.D.). Leaf scorch was pronounced by midsummer on roadside maples in Quebec City and vicinity (G.B.O.).

AESCULUS - Horsechestnut

LEAF BLOTCH (Guignardia aesculi) was severe on A. hippocastanum at Pugwash and Wallace, Colchester Co. and moderate at Merigomish, Greenhill and Dufferin, Pictou Co., N.S. (L.P.M., G.A.V.S.).

AMELANCHIER

RUST (Gymnosporangium sp.) was observed on A. sp. at Three Hills, Alta. (A.W.H.).

BROWN ROT (Monilinia amelanchieris) affected cultivated Saskatoon berries and wild A. spp. at Whitelaw, Alta. where it has been present on trees transplanted from the wild for at least 3 years. It was also observed at Beaverlodge, Alta. and in the Dawson Creek, B.C. area (W.P.S., A.W.H.).

ARBUTUS - Madrona

FROST INJURY. Foliage of A. menziesii was badly browned in the Vancouver area and to a lesser extent on Vancouver Island, B.C. Early summer defoliation was about 30% (H.N.W.T.). Injury from frost and low winter temperatures was severe on ornamental trees and shrubs in many parts of B.C., particularly in the lower Fraser Valley. Broad-leaved evergreens were the most seriously affected (A.C.M.).

BERBERIS - Barberry

ROOT-KNOT NEMATODE (Meloidogyne hapla). Five/50 shrubs of the cultivar 'Sheridan Red' of B. vulgaris were visibly affected in a nursery at Islington, Ont. (A.E.S., M.W.).

BETULA - Birch

CANKER (Cytospora sp.) affected B. alba pendula at Edmonton, Alta. (A.W.H.).

TWIG BLIGHT (Melanconium bicolor) occurred on 10/40 trees of B. alba pendula in a nursery at Kabaska Falls in n.w. Ont. According to Mrs. R.H. Arnold, who confirmed the identification, this may be the conidial state of Melanconis stilbostroma (Fr.) Tul. (A.E.S.).

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* The diseases reported in this section are mainly those of shade trees and ornamental shrubs, although occasional reference is made to diseases of native forest trees. For a more comprehensive report of tree diseases in Canada the reader is referred to the Annual Reports of the Forest Insect and Disease Survey published by the Canada Department of Forestry, Ottawa, Ontario.

CASTANEA - Chestnut

CHESTNUT BLIGHT (Endothia parasitica) was severe on sweet chestnut trees, C. dentata, throughout the Lake Erie district, Ont. (B.W.D.).

CHAMAECYPARIS - Cypress

ROOT ROT (Phytophthora cinnamomi) caused the death of or severe injury to 41/45 Lawson cypress shrubs in a garden in Victoria, B. C. (R.G.A.).

CORNUS - Dogwood

LEAF SPOT (Septoria cornicola). Affected specimens were received from a nursery at Calgary, Alta. (F.R.H.).

COTONEASTER

SILVER LEAF (Peniophora cinerea (Fr.) Cooke) was observed in a shrub at Edmonton, Alta. The fruiting basidiomycete associated was determined by Dr. M. K. Nobles, Ottawa (A.W.H.).

WINTER KILLING was severe on C. spp. on the B. C. coast and in the lower Fraser Valley. Many shrubs were killed to the ground (H.N.W.T.).

CRATAEGUS - Hawthorn

LEAF SCALD (Fabraea maculata). Infection continues to be heavy on older trees in west and north Vancouver, B. C. The amount of defoliation is frequently over 50%. The lack of adequate spray equipment among home owners hinders any attempt at control (H. N. W. T.).

FORSYTHIA - Golden Bells

STEM GALL (Phomopsis sp.). Two twigs with 10 galls present were received from Chester, N. S. (K.A.H.).

FRAXINUS - Ash

ANTHRACNOSE (Gloeosporium aridum). Specimens of affected F. pensylvanicum were received from Montreal. One tree, among several planted as street trees, was affected (D. W. C.). Infection was severe on a few ash trees at Cheverie, Hants Co., N. S. (L.P.M., G.A.V.S.).

RUST (Puccinia sparganioides) caused moderate damage to several shade trees of F. americana at Wolfville, N. S. (L.P.M., G.A.V.S.).

SUNSCALD CANKERS affected 500 fast-growing, thin-barked saplings in a nursery at Ste. Thérèse, Que. White ash was only slightly affected but heavy damage occurred on the cultivar 'Marshall's Seedless' (A.E.S.).

HYDRANGEA

POWDERY MILDEW (Erysiphe polygoni) affected 60% of the foliage of a bush at Fredericton, N.B. (S.R.C.).

OEDEMA (excess water). Specimens were received from Roberval, Chicoutimi and Notre Dame du Lac, Que. (D.L.).

JUNIPERUS - Juniper

RUST (Gymnosporangium spp.). A single bush of J. scopulorum was infected by G. bethelii at Deep Cove on the Saanich Peninsula and about 50 plants of J. communis var. suecica, 3-4 feet in width, were severely infected by G. clavariaeforme at Pitt Meadows in the lower Fraser Valley, B. C. Both rusts were determined by W.G. Ziller (R.G.A.). Unidentified Juniperus species were found infected by G. juniperi-virginianae at Ottawa, Ont. and Montreal, Que. In both cases pycnia of a rust, presumably the same species, were found in the vicinity. According to J.A. Parmelee, both records represent extensions in the known geographic range of the rust (A.E.S.).

TWIG BLIGHT (Phomopsis juniperovora) occurred on J. chinensis var. pfitzeriana and J. sabina var. tamariscifolia at Whonock in the lower Fraser Valley, B. C. (R.G.A.).

LARIX - Larch

FROST INJURY. Both European and Siberian larch suffered frost damage at the Kananaskis Forest Experiment Station, Alta. (J.A.B.).

LONICERA - Honeysuckle

TWIG BLIGHT (Diplodia ? lonicerae). A Diplodia, possibly the above species, was found fruiting on branches of L. tatarica at Sillery, Que. (D.L.).

LEAF BLIGHT (Herpobasidium deformans) was abundant on honeysuckle shrubs in a nursery at St. Nicholas, Que. (G.B.O.). Infection was rated 4-sl. 9-mod. 2-sev. in nurseries inspected in Que. in 1965 (J.R.).

POWDERY MILDEW (Microsphaera penicillata) was observed on shaded honeysuckle hedges at Sillery (D.L.) and was rated 3-sl. 5-mod. in nurseries inspected in Que. (J. R.).

MALUS - Ornamental Crab

FIRE BLIGHT (Erwinia amylovora) was less general than in 1964 in the Lethbridge, Alta. area (F.R. H.). It has become widespread in Saskatoon, Sask. where many ornamental Malus spp. used in boulevard plantings have become affected (R.J.L.). Several trees were severely affected in Quebec City and vicinity (G.B.O.).

BRANCH CANKER (Botryosphaeria obtusa) affected young and old trees at St. Lambert, Que. (A.E.S.).

SCAB (Venturia inaequalis). Infection was severe on a large number of ornamental Malus trees in a nursery at St. Nicholas, Que. (G.B.O.). Heavy infections were seen at Fredericton, N.B. (S.R.C.).

PICEA - Spruce

NEEDLE RUST (Chrysomyxa weirii). Heavily infected specimens were received from Buck Lake, Leduc and Bluffton, Alta. (A.W.H.).

CANKER (Cytospora ?kunzei). Branch cankers were common on P. pungens in Quebec City, Que. (G.B.O.).

BUTT ROT (Polyporous tomentosus) was responsible for windthrow of white spruce, P. glauca, in windbreaks at several points in the Lake Simcoe district, Ont. (B.W.D.).

SALT DAMAGE. Crowns of roadside white spruce and most pine species were severely browned by salt spray in the Sault Ste. Marie, Cochrane, Swastika and Parry Sound districts of Ont. (B.W.D.).

PINUS - Pine

NEEDLE RUST (Coleosporium asterum). Light infections were seen on a specimen tree of P. resinosa in Ottawa, Ont. (A. E. S.) and specimens were received from Ste. Foy, Que. (D.L.).

BLISTER RUST. An infected branch was received from Ottawa, Ont. Infection apparently came from Ribes spp. in an abandoned nursery nearby (H.S.T.).

NEEDLE BLIGHT (Dothiostroma pini Hulbarry) continued to be the major problem in exotic pine plantations on Vancouver Island, B.C. (A.C.M.). Pinus sylvestris in the Kananaskis Valley, Alta. was severely affected (J.A.B.) and it caused slight damage to ornamental trees of Austrian pine, P. nigra in St. John's, Nfld. (J.H.).

ROOT ROT (Fomes annosus) was found, for the first time in s. e. Ont., in a 40-year-old mixed plantation of jackpine, P. banksiana, and red pine, P. resinosa, in the Northumberland County Forest (B. W.D.).

BROWN-SPOT NEEDLE BLIGHT (Scirrhia acicicola (Dearn.) Siggers) caused severe damage to jackpine and lodge pole pine, P. contorta var. latifolia in a plantation nr. Brandon, Man. (J. G. L.).

CHEMICAL INJURY (sulfur dioxide fumes). Damage, characteristic of that caused by SO_2, was observed in the vicinity of Marysville, south of Kimberly, B. C. Severe browning and light mortality of lodgepole pine, ponderosa pine and western larch occurred (A.C.M.). Damage was very light on all tree and shrub species examined in the vicinity of a smelter at Thompson, Man. except in a small area a few miles south of the smelter where moderate damage occurred to the foliage of jackpine and trembling aspen (J.G.L.).

WINTER DRYING occurred in scattered areas but was occasionally severe on most coniferous species throughout Ont. (B.W.D.). It was also severe on many ornamental conifers in Montreal, Drummondville, Quebec City, at numerous localities in the lower St. Lawrence district and at Caplan, Que. (G.B.O.). Severe winter drying was observed in a hedge of Pinus sylvestris at Amherst Point, N. S. (L.P.M., G.A.V.S.).

PLATANUS - Sycamore

ANTHRACNOSE (Gloeosporium nervisequum) is well established on sycamore in boulevard and park specimens in Saanich Municipality, B. C. Damage from defoliation and twig cankers was more severe in 1965 than previously seen (W.R.O.). It caused considerable defoliation on southern Vancouver Island early in the spring (W.R.F.).

POPULUS - Poplar

CANKER (Cytospora chrysosperma). A survey of the decline and death of aspen growing in bluffs in the parkland region of Alta. indicated that grazing combined with the 1962 drought had weakened and predisposed trees to attack by C. chrysosperma (J.A.B.). It was reported, in some cases as causing considerable damage, from Coronation, Morinville, Nanton, Ryley, Three Hills and Vauxhall, Alta. (A.W.H.).

CANKER (Dothichiza populea) caused an estimated 25% damage to P. nigra italica in a nursery at Spencerville and moderate damage to 1000 trees of the same species at Richmond Hill, Ont. (A.E.S.).

CANKER (Hypoxylon pruinatum) was common on aspen in the parkland region of Alta. (J.A.B.).

RUST (Melampsora medusae) was observed on poplars at Vulcan, Alta. (A.W.H.).

RUST (Melampsora occidentalis). Infections were moderate and widespread in shelterbelt and ornamental plantings in s.w. Alta. by mid-August (F.R.H.).

CANKER (Septoria musiva). Affected specimens were received from Jean Cote, Vulcan, Donalda, where 18% of the trees were affected and Smoky Lake, Alta. where 5% of the trees showed basal cankers (A.W.H.).

YELLOW LEAF BLISTER (Taphrina populina). Ornamental plantings of P. tremuloides were slightly infected at Bishop's Falls, Nfld. (J.H.).

PRUNUS - Native and Flowering Cherries

BLACK KNOT (Apiosporina morbosa (Schw.) Arx = Dibotryon morbosum (Schw.) Theiss. & Syd.). Collections were obtained on most Prunus species throughout Ont. In the Geraldton, White River, Lindsay and Sault Ste. Marie districts, up to 80% of P. pensylvanica trees were infected in many localities. It also caused significant damage in a domestic plum orchard on St. Joseph Island in the Sault Ste. Marie district (B.W.D.). A heavy infection was seen on P. serotina at La Patrie, Compton Co. (G.B.O.) as well as on P. virginiana in a nursery at Ste. Thérèse, Terrebonne Co., Que. Infections were common, but light, on P. pensylvanica throughout the Maritime Provinces (L.P.M., G.A.V.S.) and were heavy on native Prunus spp. in the St. John's area, Nfld. (O.A.O.).

WITCHES' BROOM (Taphrina weisnerii (Rathay) Mix = T. cerasi (Fckl.) Sadeb.). Up to 12 brooms per tree were seen on 50% of P. serotina trees over a half-acre block at Sackville, N.B. (L.P.M., G.A.V.S.).

WINTER KILLING. Many hedges of Prunus laurocerasus were killed to the ground in coastal B.C. and the lower Fraser Valley by the extreme low temperatures prevailing in December, 1964 (H.N.W.T.).

PSEUDOTSUGA - Douglas Fir

NEEDLE CAST (Rhabdocline pseudotsugae) caused considerable damage to Christmas tree stands of P. taxifolia in the East Kootenay region of B.C. (A.C.M.).

QUERCUS - Oak

ANTHRACNOSE (Gloeosporium quercinum) caused slight to moderate browning on newly-planted trees of Q. borealis in Queen's Co., N.B. and in Annapolis and Kings Counties, N.S. (L.P.M., G.A.V.S.).

RHAMNUS - Buckthorn

CROWN RUST (Puccinia coronata). Infection was slight on 10 trees in a nursery at Waterdown and on one on the Experimental Farm, Ottawa, Ont. (A.E.S.).

RHODODENDRON

GRAY MOLD (Botrytis cinerea). Trace infections were seen on the foliage of an unknown cultivar at Kentville, N.S. (C.O.G.).

LEAF SPOT (Diplodina eurhododendri) affected 5% of the foliage of a young planting at Grand Pré, N.S. (C.O.G.).

LIME-INDUCED CHLOROSIS caused the loss of $500 worth of rhododendrons on one property at Victoria, B.C. The lime content of the soil was very high and all the leaves of some of the plants were yellow (W.R.F.).

RIBES - Flowering Currant

ANTHRACNOSE (Drepanopeziza variabilis) appeared in August in a 150-foot hedge of R. alpinum in Ottawa, Ont. Infection was generally trace to slight but was severe in one section of the hedge near a coniferous tree where humidity was high. Specimens for identification were also received from the Ottawa area (D.W.C.). Infections were rated 6-sl. 5-mod. 3-sev. on alpine currant in nurseries in Que. (J.R.).

ROSA - Rose

CROWN GALL (Agrobacterium tumefaciens) occurred on 12/90 bushes in a garden in Vancouver, B.C. where none had appeared before. Infection may have followed winter injury (H.N.W.T.).

CANKER (Coniothyrium fuckelii) affected 15% of the plants of Rosa multiflora in a 1-acre block being grown for understock at Hornby, Ont. It progressed rapidly during hot weather in July (A.E.S.).

CANKER (Cytospora ambiens) was severe on roses at Ste. Foy, Que. (D.L.).

BLACK SPOT (Diplocarpon rosae). A heavy infection was seen at St. Andrews, N.B. (S.R.C.) and another in a nursery at Yarmouth, N.S. (A.A.MacN.). It developed later and was less severe in P.E.I. than in 1964 but certain floribunda cultivars suffered moderate damage (G.W.A.).

RUST (Phragmidium sp.) was observed at St. Albert, Alta. (A.W.H.).

POWDERY MILDEW (Sphaerotheca pannosa) which had been severe on garden roses in 1963 and 1964 and difficult to control on susceptible cultivars was not apparent, even on unsprayed roses, in the Okanagan Valley, B.C., until early September, 1965. Severe sub-zero weather in December, 1964 had killed all bushes to ground level (M.F.W.).

WINTER KILLING. Climbing roses were killed to the ground by extremely low temperatures in December, 1964 in coastal B.C. and the lower Fraser Valley (H.N.W.T.).

SALIX - Willow

CROWN GALL (Agrobacterium tumefaciens). A specimen bearing large galls was received for diagnosis from Montreal, Que. (D.W.C.). One of six trees in a lawn at Duberger, Que. was killed and three others badly affected but still alive (D.L.).

CANKER (Cytospora chrysosperma) affected a tree of S. laurifolia at Leduc, Alta. (A.W.H.) and 20/40 trees of the same species at St. Laurent, Que. Another tree at Drummondville, Que. was killed by the disease (A.E.S.).

TWIG BLIGHT AND CANKER (Diplodina salicis West.). An infected specimen was received from Notre Dame du Lac, Que. with fruiting bodies of a Diplodina, probably D. salicis (D.L.). It is generally considered that D. salicis West. belongs to the same life cycle as Discella carbonacea Berk. & Br. According to H. Butin (Phytopath. Z. 32: 339-415. 1958.) the perfect state of D. carbonacea is Cryptodiaporthe salicella (Fr.) Petrak which equals C. salicina (Curr.) Wehm. (D.W.C.).

WILLOW BLIGHT (Pollacia saliciperda). In N.B., leaf browning was severe in a hedge at Ste. Anne, Madawaska Co. and moderate at several locations in Madawaska, Northumberland, Victoria and Sunbury Counties. In N.S., the disease was severe at West River, Antigonish Co. and moderate in parts of Inverness, Antigonish, Guysborough, Pictou, Hants and Kings Counties. In P.E.I. browning was moderate nr. Tignish, Prince Co. (L.P.M., G.A.V.S.).

SAMBUCUS - Elder

CROWN ROT (Pythium sp.). Affected specimens were received from Carstairs, Edmonton, Leduc and St. Paul, Alta. A phycomycete previously isolated from Sambucus showing similar symptoms (Can. Plant Dis. Surv. 45: 75. 1965.) appears to be a species of Pythium, according to D.L. McIntosh (A.W.H.).

LEAF SPOT (Septoria sambucina) was observed on Sambucus sp. at Sexsmith, Alta. (A.W.H.).

SORBUS - Mountain Ash

FIRE BLIGHT (Erwinia amylovora). Affected specimens were received from Claresholm, Edmonton and St. Paul, Alta. (A.W.H.) and from Winnipeg, Man. (W.A.F.H.).

DIE-BACK AND CANKER (Leucostoma massariana (de Not.) Höhn. (Valsa m. de Not.). Specimens were received from Val d'Or, Que. The amount of

damage to S. americana was stated to be extensive although it is suspected that prior winter injury was a factor. Both perfect and imperfect states of the fungus were in good fruit. Although this is the first report to the Survey, Mrs. R. H. Arnold states that Kern (Phytopath. Z. 40: 303-314. 1966.) refers to collections on Sorbus from Percé and Anse Pleureuse, Que. The organism is close to Valsa cincta but is considered separate on the basis of host affinities (D.W.C.). The same organism caused slight damage to 100 trees of S. aucuparia in a nursery at Fabreville, Que. (A.E.S.).

CORAL CANKER (Nectria cinnabarina) caused a shoot blight of mountain ash at Nevon, Alta. (A.W.H.).

SPIRAEA

CORAL CANKER (Nectria cinnabarina) caused a die-back of spiraeas at Ste. Foy, Que. The affected twigs were covered with a black mold, Fumago sp. (D.L.).

SYMPHORICARPOS - Snowberry

POWDERY MILDEW (Microsphaera diffusa). Specimens on S. albus were received from Chateau Richer, Montmorency Co., Que. (D.L.).

SYRINGA - Lilac

POWDERY MILDEW (Microsphaera penicillata). White lilacs were heavily infected in a garden in Ottawa, Ont. Standard purple cultivars in the same garden were less seriously affected (D.W.C.). Infection was rated 2-sl. 3-mod. 1-sev. in nurseries inspected in Que. (J.R.).

SHOOT BLIGHT (Phytophthora citricola Sawda.) was observed at Athabaska, Brooks, Edmonton, Rosebud and Sundre, Alta. The pathogen was determined by D. L. McIntosh (A.W.H.). Phytophthora syringae (Kleb.) Kleb. was reported (Can. Plant Dis. Surv. Ann. Rept. 20: 98. 1941) from La Pocatière, Que. by R.O. Lachance. According to Waterhouse (C. M. I. Misc. Publ. No. 12. pp. 1-120. 1956.), these two species are distinct (D.W.C.).

BACTERIAL BLIGHT (Pseudomonas syringae). Specimens were received from Didsbury and Red Deer (A.W.H.) and it was found in 2 garden plantings at Lethbridge, Alta. (F.R.H.).

ULMUS - Elm

DUTCH ELM DISEASE (Ceratocystis ulmi). The known distribution in Ont. was extended to the Sudbury district. Infected trees were found as far west as Spanish on the mainland and on Manitoulin Island (B.W.D.). Known distribution in N.B. did not change greatly in 1965. Its occurrence at St. Andrews, 15 miles from the nearest known infection at Milltown, represents the greatest extension (L.P.M., G.A.V.S.).

DIE-BACK (Cytospora sp.) affected 2/25 trees of U. parvifolia at Fort William, Ont. Infection was probably secondary following undetermined injury (A.E.S.).

LEAF SPOT (Gnomonea ulmea) caused slight damage to U. parvifolia in a nursery at Campbell's Bay, Ont. (A.E.S.).

CORAL CANKER (Nectria cinnabarina) was responsible for moderate to severe damage to U. pumila at Cornerbrook, Nfld. (J.H.).

TWIG BLIGHT (Tubercularia ulmea). Affected specimens were received from Loretteville, Que. (D.L.).

CHEMICAL INJURY. Spray drift of 2,4-D caused moderate to severe injury to several young elm trees at Ste. Foy, Que. (G.B.O.).

DISEASES OF HERBACEOUS ORNAMENTALS

ALTHAEA - Hollyhock

RUST (Puccinia malvacearum) was observed in the Okanagan Valley, B. C. (G.E.W.) and at Edmonton and Sangudo, Alta. (A. W. H.). Affected specimens were received from East Angus, Que. (D.L.).

AQUILEGIA - Columbine

POWDERY MILDEW (Erysiphe polygoni) occurred generally throughout the Okanagan Valley, B. C. late in the summer (G.E.W.).

BEGONIA

POWDERY MILDEW (Erysiphe cichoracearum). Specimens were received from Levis, Que. (D.L.).

BACTERIAL LEAF SPOT (Xanthomonas begoniae). Infected leaves were received from Ormiston, Sask. in October (D.W.C.).

SPOTTED WILT (virus) affected 5% of the begonias in a greenhouse at Yarmouth, N.S. All leaves of affected plants showed ringspot symptoms (A.A. MacN.).

CALENDULA

SMUT (Entyloma polysporum). All plants in a planting at Wolfville, N.S. were infected. Infections in early June will cause death before fall. Later infections disfigure the foliage but plants will continue to flower (K.A.H.).

CALLISTEPHUS - China aster

WILT (Fusarium oxysporum f. callistephi). Infected specimens were received from Edmonton and Stony Plain, Alta. (A.W.H.).

ASTER YELLOWS (aster yellows virus). Infection was rated 25% in a home garden at Port Morien, N. S. (A.A. MacN.).

CHRYSANTHEMUM

VASCULAR DISCOLORATION (Ascochyta chrysanthemi Stev.). Most plants in a propagator's greenhouse at Leamington, Ont. had reddish-brown discolored vascular tissues at the stem bases. A. chrysanthemi was isolated, often in association with Pectobacterium carotovorum var. chrysanthemi (J. H. H.). This represents a new record for Canada (D.W.C.).

GRAY MOLD (Botrytis cinerea). The pathogen was isolated from diseased plants in a propagator's greenhouse at Leamington, Ont. (J.H.H.).

BACTERIAL BLIGHT (Pectobacterium carotovorum f. sp. chrysanthemi) affected chrysanthemums in a propagator's greenhouse at Leamington, Ont. Infected plants were dwarfed with an upward curling of the leaves. P. c. f. sp. chrysanthemi was isolated and its pathogenicity proven by Koch's postulates (J.H.H.). This disease has not been reported in Canada (D.W.C.).

CYCLAMEN

ROOT-KNOT NEMATODE (Meloidogyne hapla) occurred on roots of florists' cyclamen at Cote St. Luc, Que. (M.W.).

DAHLIA

CROWN GALL (Agrobacterium tumefaciens). Infected specimens were received for diagnosis from Montreal, Que. (D.W.C.).

DATURA

RING MOSAIC (virus) caused severe leaf distortion on D. metel at Deschambault, Que. (D.L.).

DELPHINIUM - Larkspur

BACTERIAL LEAF SPOT (Pseudomonas delphinii). Specimens were received from Charlevoix Co., Que. showing profuse spotting of leaves and stems. The grower reported that the disease had been present for 2 years and was spreading (D.W.C.).

ASTER YELLOWS (aster yellows virus). Typical infections were seen in a Saskatoon, Sask. garden. Generally aster yellows was not a problem in ornamentals in 1965 (R.J.L.).

GLADIOLUS

CORM ROT (Botryotinia draytoni). Affected specimens were received from Edmonton and Rochester, Alta. (A.W.H.).

CORM ROT (Curvularia trifolii f. sp. gladioli, Fusarium oxysporum f. gladioli). One-half of a 1000 corm lot of 'Early Spring' at Leamington, Ont. was refused export certification on examination. Both fungi were present on the same corms and the symptoms of Curvularia were very pronounced on the husks (A.E.S.). Several small lots at Kentville, N.S. were infected with F. o. f. gladioli. 'Life Flame' appeared to be the most susceptible (K.A.H.).

YELLOWS (Fusarium orthoceras var. gladioli). Average damage was slight in a 1-acre field grown nr. Harrow, Ont. but was severe in a low area of the field (A.E.S.).

SCAB (Pseudomonas marginata). Specimens were received from Ponoka and Stony Plain, Alta. (A.W.H.). Traces were seen on cormels of 'Spotlight' at Kentville, N.S. No infection had been seen in the stock in 1963 and 1964 and it was grown in 1965 in soil which had never grown gladiolus previously (K.A.H.).

NECK ROT (Stromatinia gladioli). Approximately 5% of 20,000 plants at St. Eustache, Que. were infected at the time of field inspection in Aug. (A.E.S.). Very little infection was seen at Kentville, N.S., probably because of the dry summer. Even the highly susceptible cultivar 'Spotlight' was free of infection (K.A.H.).

LEAF SCORCH (atmospheric fluorides). Specimens were received from Kitimat, B.C. (W.R.F.).

HEUCHERA

RUST (Puccinia heucherae). All leaves in a planting for export at Brandon, Man. were infected (W.C.McD.).

HOYA - Waxflower

ANTHRACNOSE (Colletotrichum gloeosporioides) caused gradual defoliation and death of H. carnosa at Woodfibre, B.C. (H.N.W.T.).

IMPATIENS - Balsam

ROOT-KNOT NEMATODE (Meloidogyne hapla) was reported on roots of Impatiens sp. from Calgary, Alta. (M.W.).

IRIS

LEAF SPOT (Didymellina macrospora). None was found in 1965 during inspection of 500,000 plants on Vancouver Island, B.C. (R.P.M.). Moderate infections were seen on rhizomatous iris in all 4 nurseries inspected in the Port Arthur, Ont. district (A.E.S.).

LILIUM - Lily

ROOT, BASAL PLATE AND SCALE ROT (various organisms) were observed on Lilium maxwelli x L. wilmontii (Paterson's hybrids) at the University of Saskatchewan, Saskatoon, Sask. The predisposition to rot may be due mainly to poor soil condition -- a heavy clay loam, but there appears to be a relationship between cultivar and rotting. 'Lillian Cummings' is resistant; 'Apricot Glow', 'Enchantment' and 'Dunkirk' are susceptible. New seedlings show various degrees of resistance. Colletotrichum gloeosporioides, Cylindrocarpon radicicola and Rhizoctonia solani isolated from lesions showed the ability to cause rot on detached, wounded bulb scales. Only C. gloeosporioides was able to cause rot on undamaged scales of some cultivars (J.D.S.). All bulbs in a lot of 3000 at Brampton, Ont. had basal scale and root lesions attributed to Rhizoctonia solani and some 1500 plants of 'Croft Easter' at Bell's Corners, Ont. showed about 70% damage from the same organism. Plants were short with many of the buds papery rendering them unsaleable. Other organisms present were Pythium spp., Pratylenchus penetrans and Aphelenchoides sp., possibly A. subtenuis (A.E.S.).

MYOSOTIS - Forget-me-not

POWDERY MILDEW (Oidium sp.) was severe in a planting at Deschambault, Que. (D.L.).

NARCISSUS - Daffodil

NEMATODES (Aphelenchoides saprophilus) were found in narcissus bulbs from Ottawa, Ont. (M.W.).

SCORCH (Stagonospora curtisii). Average infection was slight in 7/17 plantings examined on the lower mainland of B.C. It was not observed on Vancouver Island (B.M.L., R.P.M.).

MOSAIC (virus). Trace infections were seen in 3/17 fields on the lower mainland and in 1 field on Vancouver Island, B. C. (B.M.L., R.P.M.).

PAEONIA - Peony

BOTRYTIS BLIGHT (Botrytis paeoniae). Infected specimens were received from Claresholm, Red Deer and Sarrail, Alta. Infection at Sarrail was severe (A.W.H.). Blight was seen at St. Foy and specimens were received from Levis, Que. (D.L.).

PELARGONIUM - Geranium

BASAL STEM ROT (Botrytis cinerea) was seen on stem cuttings for propagation at several locations in the Okanagan Valley, B.C. (G.E.W.).

PETUNIA

STEM ROT AND WILT (Sclerotinia sclerotiorum) caused extensive damage in 3 plantings at Victoria, B. C. The disease has built up because of lack of rotation. Plants developed a permanent wilt; stems became chlorotic and hollow and unable to support foliage and bloom. Sclerotia and mycelium were abundant in the tissues at the bases of affected stems (W.R.O.).

PHLOX

POWDERY MILDEW (Erysiphe cichoracearum). Infections were slight to moderate in 9 nurseries inspected in Que. (J.R.) and specimens were received from Vincennes, Champlain Co., Que. It is troublesome each year on perennial phlox (D.L.). It caused heavy defoliation in garden plantings in the Kentville, N.S. district. Drought apparently favored infection and disease development (K.A.H.).

TULIPA - Tulip

FIRE (Botrytis tulipae). Secondary fire was slight to severe on all cultivars on Vancouver Island, B. C. but cooler than average temperatures in May and June offset most of the effects of partial defoliation and bulb growth was good. No primary or secondary fire was seen on 20,000 tulips planted on light, well drained, newly broken land (R. P. M.). Trace amounts were seen in a planting on the lower mainland of B. C. (B. M. L.). At Kentville, N. S., slight damage was evident in plantings left down for 2 years. First-year plantings were free of infection. Spread was not evident because of the dry weather (K. A. H.). Practically all blooms in a greenhouse at St. John's, Nfld. were conspicuously spotted in April. The symptoms had developed over a period of 3 days (O.A.O.).

FROST. One planting in a frost pocket on the west side of the Saanich Peninsula on Vancouver Island, B.C. suffered severe damage. This was followed by botrytis fire and the tops were almost completely destroyed. (R.P.M.).

VIOLA - Pansy

LEAF SPOT (Centrospora acerina). Infections were rated trace to 1% in plantings examined in Kings Co., N. S. (A.A.MacN., K.A.H.).

LEAF SPOT (Cercospora granuliformis). Fifty% of the old leaves in a nursery planting in Kings Co., N. S. were infected (A.A.MacN., K.A.H.).

ZINNIA

POWDERY MILDEW (Erysiphe cichoracearum). Infection was moderate, late in the season, in a home garden at Ottawa, Ont. (D.W.C.).

STEM CANKER (Rhizoctonia solani). A small percentage of dwarf zinnias were killed in a home planting at Ottawa, Ont. (D. W. C.).

ZYGOCACTUS - Christmas cactus

STEM ROT (Fusarium sp.). Specimens were received from Montreal, Que. A species of Fusarium was consistently isolated from affected areas at the bases of stems (P.K.B.).

HOST INDEX

APPENDIX "A".
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B. J. S. *	Dr. B. J. Sallans Saskatoon, Sask.
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