Of other pests already recorded from Canada, a number of identifications have been made, but the data, except for indicating the continued presence of these forms, have not revealed any new information on distribution. These forms include such pests as Pratylenchus pratensis, Anguina agrostis, Aphelenchoides fragariae, Aphelenchoides parientinus, Ditylenchus dipsaci and Aphelenchus avenae.

## Plant Diseases in Newfoundland

J.F. Hockey

The following observations were made during a four-week field trip beginning in late July, 1949. No attempt has been made to summarize other reports and references to plant diseases in Newfoundland. The following remarks are confined to such diseases as were observed during the short period of the summer survey. They will be reported by crops.

### POTATO

Potato Wart - Potato wart or canker is common in gardens and small plots in many parts of the Avalon Peninsula and in areas along the East Coast. It is not present in the West Coast districts as far as could be ascertained. Farmers in the West Coast districts stated they had not seen it nor heard of its occurrence there.

Potato wart has been present for over twenty years. (See note below).

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Note: Potato wart has in reality been present in Newfoundland for over 40 years as it was found there in 1909. According to Dr. Gussow, former Dominion Botanist, the editor of a Montreal farm paper sent him for examination specimens of tubers affected by wart, which the editor had received from a farmer on Red Island in Placentia Bay, Newfoundland (Evidence of Mr. H.T. Gussow before the Select Standing Committee on Agriculture & Colonization 1909-10. Ottawa 1910, p. 74). The discovery was published promptly and Canadian farmers were warned against the danger, along with a graphic description of the disease. (Gussow, H.T. A serious potato disease occurring in Newfoundland: Dept. Agr. Central Exp. Farm Bull. 63. October 1909). Dr. Gussow "was sent by the Department of Agriculture to investigate the origin of the disease and advise the Newfoundland government in dealing with it". When in December 1909 he visited the general locality, from which the first samples came, he found that the disease was "far more prevalent than was supposed". From enquiries made on the spot he concluded that "the disease was known to some growers for several years" (Evidence p. 64) and that it probably had been"introduced by means of diseased tubers from Scotland".

Early in the 1930's the Newfoundland Government imported potato seed of apparently resistant varieties and distributed it to farmers and part-time farmers. This seed held up for many years, but during the 1940's the imported varieties broke down with canker. Some small lots of Arran Victory and Arran Pilot were imported and distributed in the spring of 1949. Plots of these latest imports were seen in the Conception Bay area. Plants of Arran Victory were 100 per cent affected in one plot. Adjacent plants of Arran Pilot showed some infection, whereas, a third plot of the variety Sebago showed no infection at the time of inspection.

The following are the main potato varieties that have been tested in the Conception Bay area during the past several years and have been found susceptible to potato wart: Arran Victory, Arran Banner, Arran Pilot, Kerr's Pink, Great Scot, Bliss Triumph, Irish Cobbler, Green Mountain, Spaulding Rose, Early Rose, Dakota Red, Gold Coin, and Island Blues or Cow Horn Potato.

The part-time farmer with his small plot of ground finds potato canker his chief trouble. He has insufficient arable land for a rotation of crops. On the other hand the farmer with 10 to 50 acres under cultivation has little or no loss from potato canker. He rotates his crops between potatoes, cabbage or turnips and hay and occasionally plows down as green manure an oat-pea-vetch mixture or other annual crop. When cabbage is planted the farmer usually follows the recommended corrosive sublimate treatment for the control of maggot. This treatment may have an effect on the incidence of canker in some fields.

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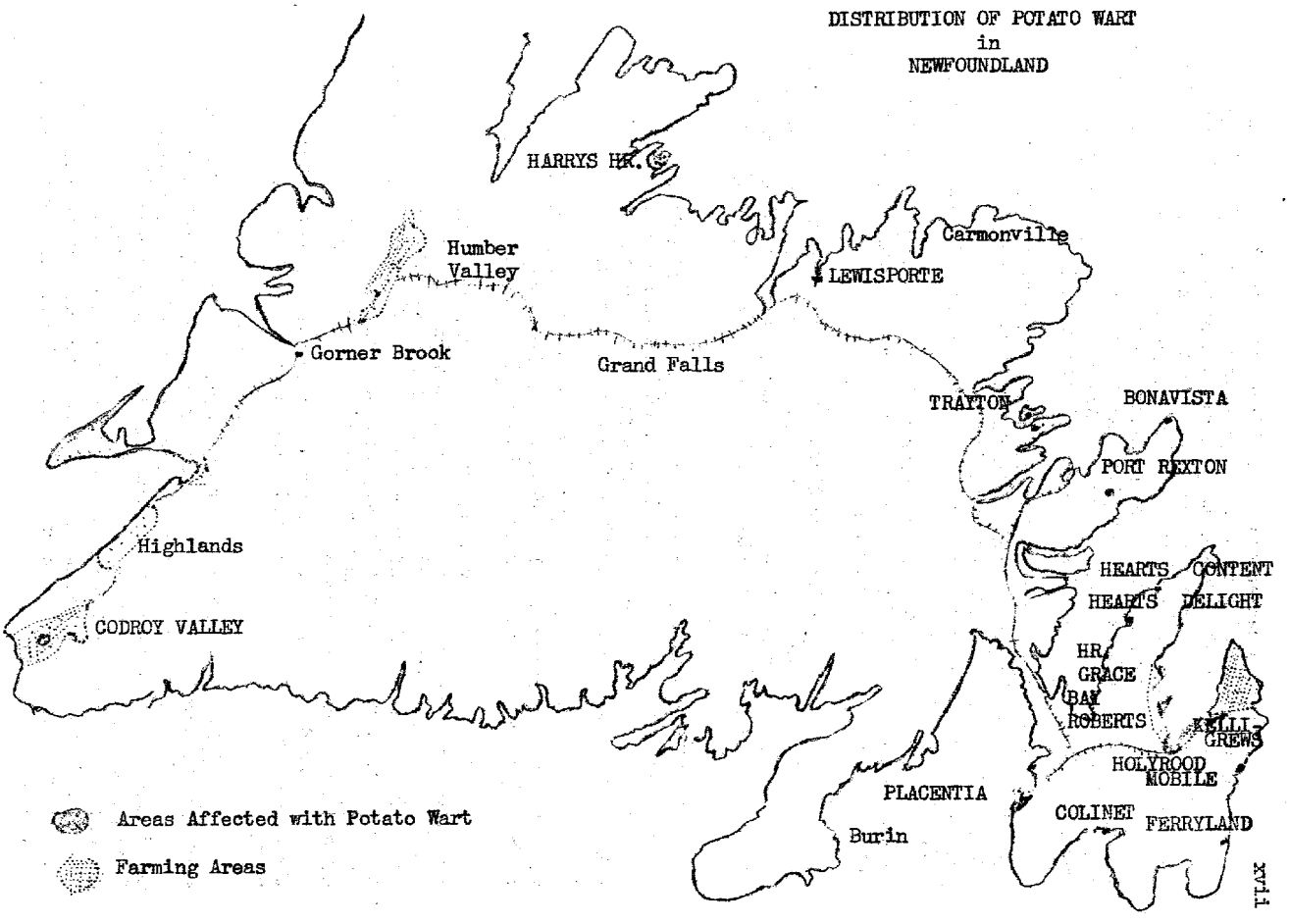
Later in 1949 a more detailed report on potato wart in Newfoundland was prepared by G.C. Morgan, representative of the Division of Plant Protection at St. John's. Of special interest is his map of Newfoundland, here reproduced, showing the areas where wart is known to occur.

Among the potato varieties listed by Hockey as susceptible in tests in the Conception Bay area, Arran Victory, Arran Banner, Arran Pilot, Great Scot, and Kerr's Pink are considered immune in Scotland (The maintenance of pure and vigorous stocks of varieties of potatoes. Dept. Agr. for Scotland Misc. Publ. No. 3, revised edition 1944). Under conditions in Pennsylvania the American varieties Irish Cobbler, Green Mountain, Spaulding Rose, Dakota Red, and Gold Coin and the British varieties Arran Victory, Great Scot and Kerr's Pink were immune, whereas Bliss Triumph and Early Rose were susceptible to wart (F. Weiss et al. U.S.D.A. Dept. Bull. 1156. 1923). More recent trials in Pennsylvania (R.E. Hartmen and R.V. Akeley. Am. Potato Jour. 21(10): 283-288. 1944) indicate that Sebago is susceptible.

It seems quite probable that the susceptibility of varieties immune to wart in Great Britain and Pennsylvania under conditions in Newfoundland is the result of biologic specialization. Such specialization in Synchytrium endobioticum was discovered almost simultaneously by C. Blattny (cf. R.A.M. 25:468-9. 1946) working in Czechoslovakia and H. Braun (cf. R.A.M. 22:273. 1943) in Germany. Braun recognized three biotypes, and found two potato varieties immune to all three biotypes.--I.L. Conners.


DISTRIBUTION OF POTATO WART
in
NEWFOUNDLAND
HARRYS HR.
Humber
Valley
Carmonville
LEWISPORTE
Gorner Brook
Grand Falls
TRAYTON
BONAVISTA
PORT REXTON
Highlands
HEARTS CONTENT
HEARTS DELIGHT
CODROY VALLEY
HR.
GRACE
BAY
ROBERTS
KELLI-
GREWS
HOLYROOD
MOBILE
PLACENTIA
COLINET
FERRYLAND
Burin
Areas Affected with Potato Wart
Farming Areas

The potato canker problem is linked up with the subsistent farmer who owns a small plot of ground comparable to a garden plot. On this area he usually chooses to grow his own requirements of potatoes and possibly a few sacks extra for sale. There is a very strong opinion among many of these men that they must plant potatoes each year. Accordingly they continue to plant potatoes and in very many cases harvest crops of tubers affected with wart to varying degrees. Some of the potatoes from these small plots or gardens find their way to local markets. It would be difficult to control that trade.

Late Blight - Late blight was not positively identified during the period of the survey. Farmers in the East Coast areas claim frequent late season epidemics occurring in late August or early September. Killing frosts appear to prevent excessive losses from tuber rot.

The West Coast farmers appear to have less frequent and less severe epidemics of blight. No late blight has been seen on many farms for three or four years in succession.

Early Blight - Light scattered infections of early blight were seen on only a few farms. One severe outbreak affecting all the plants was observed in an acre field of Parsons Beauty near Jeffries. On an adjacent 1/3 acre patch of Irish Cobbler a trace of early blight was recorded.

Rhizoctonia - Plant and crown symptoms of rhizoctonia were occasionally observed. A few fields showed less than one per cent when examined. A one acre plot showed eight per cent. Farmers reported they have seen the scurf on tubers, but it was seldom severe enough to cause loss.

It should be understood that there have been no grading regulations enforced on local potato markets, hence growers' reports of no loss from rhizoctonia or scab may be open to some modification.

Scab - Common scab of potatoes is found, but little commercial loss from the disease is reported by most farmers. A few fields were seen during early harvest, but in only one field were the tubers showing scab lesions. The problem of common scab is associated with new soil and areas where brush was burned in preparing the land for breaking. In the majority of older fields under crop rotation, the farmers report only minor losses from common scab.

Powdery scab has been reported as present in Newfoundland but the disease was not seen, even on tubers in storage from the late 1948 crop.

Black Leg - Most potato fields were free from black leg, but some were observed with as much as six per cent of the plants affected.

Most of the farmers who had black leg explained its presence to either (1) new seed or (2) omission of the customary seed treatment. It was interesting to observe that many farmers use annually a corrosive sublimate or Semesan Bel treatment for their seed potatoes. The corrosive sublimate treatment is the commoner as most farmers in Newfoundland treat their main crop of cabbage plants with this chemical for the control of maggot.

Botrytis Leaf Blight - The older, yellowing leaves of plants in several fields were found with Botrytis fruiting abundantly on discoloured areas.

Virus Diseases - Mosaic was seen much more frequently than leaf roll during the survey. Mild mosaic was encountered in a few fields, infection running between thirty and ninety per cent of the plants. The majority of fields and plots examined had less than twenty per cent mosaic.

Leaf roll was not observed affecting over two per cent of the plants.

The predominance of the varieties Arran Victory, Arran Banner and Kerr's Pink, with which the writer is not very familiar, may have reduced reliability of virus disease identification in these varieties. On the other hand, much of this stock was imported from England as certified seed and the small aphid population and cool climate would tend to keep virus disease increase at a minimum.

The variety Northern Beauty was the most severely virus-infected variety seen (90%). The farmers who plant several acres of potatoes annually, obtain Certified or Foundation Seed from P.E.I. every year or every two or three years.

The field men of the Department of Natural Resources encourage farmers to get certified seed as soon as they see much evidence of virus disease. However, the local demand for certified seed of the blue potatoes is greater than the available imported supply.

## CABBAGE AND TURNIPS

Club Root - Club Root is the most prevalent and serious disease of cabbage and turnip in Newfoundland. Root maggot is undoubtedly the most prevalent pest of these crops but next to root maggot it would appear that club root takes the second largest toll. Plant losses in main crop cabbage plantings were up to thirty per cent in a few fields. Little loss from club root was seen in early cabbage fields.

Turnips were not observed severely affected with club root as an appreciable number of farmers use Wilhelmsberger swede as soon as they find their fields showing club root.

There is a definite need for an improved method for the control of club root of cabbage, as the common rotation of potatoes, crucifers, and hay does not permit of heavy applications of lime that would discourage club root but encourage potato scab. However, some growers are using lime but trying to keep their soil below pH 5.5.

Other Diseases - Downy mildew was observed as a minor disease in both turnips and cabbage.

Wire stem (probably Rhizoctonia) caused a loss of sixty per cent of the cabbage plants in a late-crop seeding.

## OTHER CROPS

Beets - A number of small plantings of beets, none exceeding half an acre were examined. Leaf spot (Cercospora beticola) was found, but in every field infection was slight. Farmers claim that they occasionally find some severely scabbed roots at harvest, but the loss is apparently so slight that it occasions no concern.

Carrots - The fall dandelion, Leontodon autumnale, is very prevalent in Newfoundland and is frequently found affected with aster yellows virus. Mr. H.A. Butler reported that the insect vector, Macrosteles divisus, is present in the province. No disease was found in most carrot plantings examined, but a few plants showing early symptoms of yellows were seen in two plantings. Some farmers were familiar with the "bunchy top" or "fuzzy root" condition as seen at harvest, but they stated loss from this cause was insignificant.

Oats - Loose smut was observed in two fields, although many were examined. No rust was seen during the survey. Leaf blotch was present to a slight extent in many fields. Blast was slight, if present, with seldom more than two or three florets affected in a head.

Strawberry - Leaf spot (Mycocphaerella Fragariae) and blotch (Diplocarpon Earliana) were quite prevalent in the Pasadena area. Leaf spot was commonly observed in many districts on both wild and cultivated plants.

Raspberry - Mosaic was commonly observed on wild plants throughout the island. Occasional plants affected with leaf curl were also seen. Canes showing a trace of anthracnose and some with cane blight were observed at Sandringham.

Apple - Scab was causing defoliation of unsprayed trees of McIntosh at Pasadena and Cartyville. Moderate infection of the leaves and fruit of Early McIntosh was evident. The varieties Yellow Transparent, Duchess, and Wealthy carried only very slight infections.

Stone Fruits - Plums and cherries are frequently found affected with black knot. The wild pin cherry is seriously affected in some districts.

Alsike Clover - Plants affected by rust (Uromyces Trifolii) were collected at McKays; this field was severely defoliated. Leaf blotch (Cymadothea Trifolii) was observed in several fields.

Grasses - Powdery mildew was observed in several fields but no rusts were found.

Balsam Fir - Witches' broom (Melampsorella Caryophyllacearum) is common, frequently causing brooms of three to five feet in diameter. A Peridermium on the needles was also frequently seen.

Willow - Scab (Fucicladium saliciperdum) was found on a few trees near Whitbourne.