when used to test peas for root rot resistance. In 1967, a survey was made in several areas in Ontario where processing peas were being grown. A collection of diseased pea plants from these areas yielded cultures of both F. solani f. pisi and F. oxysporum f. pisi (Linford) Snyd. & Hansen. Although all isolates recorded as F. solani f. pisi completely fitted the description of this fungus given in the literature, differences in pathogenicity varied from inability to produce symptoms to complete destruction of 'Progress No. 9' seedlings in 14 days.

Materials and methods

All isolates of F. oxysporum f. pisi and F. solani f. pisi were monospored before pathogenicity tests were made. Seedlings of the root rot susceptible 'Progress No. 9' pea (Pisum sativum L.) variety and of a root rot tolerant selection, 'M-129', were inoculated with each isolate. Ten-day-old plants grown in sterile sand were dug up, the roots trimmed to 2 inches and immersed in a spore-mycelium suspension for 2 hours prior to replanting in sterile soil. All disease ratings were made 14 days after inoculation.

Table 1. Incidence of Fusarium solani f. pisi in Ontario pea fields and pathogenicity rating of isolates in greenhouse tests

Field number	Location (county)	Pea variety	% plants affected	Rating[+]
1	Prince Edward		tr*	3
3	Prince Edward		tr	2
4	Prince Edward		tr	3
5	Prince Edward	Perfection	tr	2
6	Prince Edward		30	4
8	Prince Edward		15	1
9	Prince Edward		3	4
10	Prince Edward		15	5
11	Prince Edward		tr	3
13	Prince Edward		tr	0
14	Northumberland	Perfection	tr	0
15	Northumberland	Freezer 69	8	2
16	Northumberland		tr	4
17A	Northumberland	Perfection	tr	5
170	Northumbcrland	Perfection	tr	3
19	Northumberland	Pride	tr	0
20	Northumberland	Spright	tr	3
22	Middlcsex		tr	3
23	Middlescx		tr	0
24A	Middlcsex	Venus	10	5
24B	Middlesex	Venus	tr	3
25	Middlesex	Spright	20	4
26	Middlesex	Alpine	tr	5
28	Huron	Perfection	tr	4
29	Perth	Delmar 16	tr	3
31	lluron	Perfection	tr	3
32	Huron	Perfection	20	5
35	Carleton**	Wisconsin 183	5	5
37	Carleton	Perfection WR	tr	3
38	Carleton	New Season	tr	2
39	Carlcton	New Wales	tr	2

[+] 0 = no symptoms to 5 = death of the plants.
* tr = trace.
** Carleton Co. isolates were from plots at the CDA Research Station, Ottawa.

Results and discussion

Of 31 specimens collected, 16 yielded F. solani f. pisi alone, 2 yielded F. oxysporum f. pisi alone, and 13 yielded both species. Several different cultural types of F. solani f. pisi were observed, as well as s——— that showed differences in pathogenicity when inoculated onto pea seedlings under controlled conditions in the greenhouse. The results of the survey and of preliminary pathogenicity tests are given in Table 1.

It appears from this survey that F. solani f. pisi is present in most fields in Ontario where processing peas are grown. In most cases, where a highly pathogenic isolate was obtained, the losses due to the disease were greater than in areas where a moderate or weak pathogen was isolated. F. solani f. pisi and F. oxysporum f. pisi occurring together in the plants did not always produce more extensive damage than either species alone. Since type of soil, moisture, and general environmental conditions were quite variable, it is impossible to determine the actual effect of both species within a single plant. Generally, where soil was poorly drained and where rainfall had been heavy during the early summer, damage caused by root rot was severe. Further investigations to determine pathogenic variation in isolates of F. solani f. pisi are in progress.

PHYTOPHTHORA ROOT ROT OF ALFALFA IN ONTARIO IN 1969[1]

C.C. Chi[2]

In Canada phytophthora root rot of alfalfa (Medicago sativa L.) caused by Phytophthora megasperma Drechs. was first observed in Ontario in the Ottawa Valley in 1964 (1). The disease is one of the highly destructive maladies of alfalfa (1,3,4). In August 1969 a limited survey was made in Ontario and southern Quebec to determine the prevalence of the disease.

Samples were taken at random in alfalfa fields where the stand had been thinned, or in areas with plants showing yellow discoloration. The roots of suspected plants were examined, and root tissues with disease symptoms were plated on an agar medium selective for Phytophthora and Pythium (2), usinq the procedures described previously. (1).

Phytophthora root rot was found in alfalfa fields in the 19 Ontario and two adjacent Quebec counties surveyed (Table 1). The disease occurred in low areas, on slopes where drainage was poor, and in areas where

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water collected. Damage varied from slight in some fields to very severe in others. Usually only small areas in a field were affected, but in several cases the stand in an entire field was severely thinned by the disease.

Table 1. Phytophthora root rot of alfalfa observed in Ontario and southern Quebec in 1969

Province and county	Incidence of P. megasperma
Ontario	
Carleton	22/26*
Durham	5/5
Frontenac	5/5
Grenville	3/3
Halton	8/8
Hastings	1/3
Lanark	5/7
Leeds	5/5
Northumberland	3/3
Ontario	3/5
Oxford	1/3
Peel	7/7
Perth	2/2
Peterborough	2/5
Renfrew	11/11
Victoria	3/3
Waterloo	4/5
Wellington	8/9
York	5/6
Quebec	
Argenteuil	7/9
Papineau	8/12

* No. of fields from which the fungus was isolated/no. of fields sampled.

Pathogenicity tests of the Phytophthora isolates obtained revealed that all are very pathogenic to 'Vernal' alfalfa. The fungus killed 2-month-old plants in 2 weeks at 28C in a greenhouse under wet soil conditions.

The present survey indicated that phytophthora root rot is present in most of the soils in Ontario where alfalfa is grown. The disease becomes epidemic when the soil remains excessively wet during periods of prolonged heavy rainfall. Under favorable moisture conditions, the fungus may invade alfalfa plants and cause damage in a very short time. It is a potentially serious alfalfa problem in some areas, especially where the soils are poorly drained.

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FIRST RECORD OF WHITE ROT OF ONION IN COASTAL BRITISH COLUMBIA

D.J. Ormrod and J.F. Conroy[1]

White rot caused by Sclerotium cepivorum Berk. has not previously been observed on onions in coastal British Columbia, although it was seen in a small planting of garlic (Allium sativum L.) in 1951 (2) and has more recently been observed on onions (Allium cepa L.) in the southern Interior of the province (1,3). It occurs commonly in the onion growing regions of the western United States.

In June 1970 a grower in the Cloverdale muck vegetable growing area observed a disease in one field of bulb onions (Allium cepa L.) which proved to be white rot. Examination of the field showed the disease to be apparent in two small patches totalling approximately 1/4 acre.

Inquiries relative to the possible source of inoculum revealed that the field was also seeded to onions in 1969 but had not grown onions before that. Prior to 1967, the farm was used for livestock and hay production for many years. In 1965, fruit and vegetable waste and trimmings from a major Vancouver supermarket chain were used on the farm as a source of feed for cattle. Green bunching and bulb onions grown in the western United States were included in this refuse and it appears likely that some white rot infected onions were present.

The field in which the disease was detected in 1970 is the same field which received the majority of the refuse as evidenced by the presence of elastic bands and other non-decomposed packaging material.

Seed has been ruled out as a possible source of inoculum as other fields planted with the same seed in 1969 and 1970 were not affected.

Literature cited

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[1] Plant Pathologist and Horticulturist, respectively, British Columbia Department of Agriculture, Surrey, B.C.