THE RELATIONSHIP BIETWEEN CLIMATE AND FOLIAR DISEASES OF MUCK GROWN VEGETABLES IN 1966'

T. Simard[2], R. Crête[3] and L. M. Tartier[2]

Abstract

In 1966, foliar diseases of muck-grown vegetables developed more extensively than during the four previous years. This is attributed to the fact that the June rainfall approximated the 29-year average and favoured the establishment of early primary disease foci. Subsequent dryer weather particulary during the second part of June and the month of July apparently prevented the development of serious leaf blight epidemics.

Resume

En 1966, les maladies foliaires des légumes de sol organique prirent une extension plus considérable que durant les quatre annkes précédentes. On attribue ce phénomène au fait que la prkcipitation du mois de juin se rapprochant de la moyenne de 29 ans aurait favorisé le dkveloppement précoce de foyers initiaux de maladies. Une pluviosité peu abondante, surlout durant la seconde moitié de juin et le mois de juillet, aurait empêché, par la suite, toute épidémie grave de se dkvelopprr.

Introduction

The first aim of this annual survey initiated in 1959 is to record the annual occurrence and severity of diseases of the main vegetable crops in the muck soil district south of Montreal. In 1962 (2), it was noticed that a relationship seemed to exist between the amount of June rainfall and the development of such foliar diseases as blights of carrot, onion and potato. Thereafter, the annual evaluation of this relationship became the main purpose of the survey.

In 1966, the climatic conditions at tho beginning of the season indicated the desireabilityof' surveying fields for diseases during July. However, due to circumstances beyond our control, the survey was not carried until the second part of August. The diseases were recorded according to an index devised in 1961 (1) and since modified as follows:

Disease Intensity	Percent Affected Plants or Leaf Area (1),
Trace	1-10
Slight	10-30
Moderate	30-60
Severe	60-100

(1) Percent affected plants used for virus and soil borne diseases; leaf area used for leaf blights.

The meteorological data recorded at Ste. Clotilde were obtained from Mr. C. Peron, of the Research Station at St. Jean, Qué. These data for 1966 appear in Table 1 and a summaryof the survey in Table 2.

Table 1. Total rainfall in inches at Ste. Clotilde (Châteauguay)

Year	June	July	August
1965	0.78	4.37	6.00
1966	3.10	2.88	3.33
29-year average	3.39	3.52	3.48

Results

Table 2 shows that in the second part of August leaf blights of carrot (Alternaria dauci and Cercospora carotae), leaf blight of onion (Botrytis mesa.) and early blight of potatc (Alternaria solani) were present in most of the fields surveyed. In accordance with Hyre's forecasting criteria, late blight of potato (Phytophthora infestans) appeared only in the second part of August and afterwards developed slowly in fields as well as in check plots of 'Green Mountain' at Ste. Clotilde. On celery, bacterial blight (Pseudomonas apii) was more prevalent than usual, one field showing a general infection of moderate intensity. As expected from the high populations of six-spotted leafhoppers, aster yellows was commonly found in carrot and celery fields, as well as in lettuce fields according to observations made in July by Mr. R. Crête. Fusarium bulb rot (Fusarium oxysporum f. cepae) and smut (Urocystis magica) of onion appeared to be more prevalent than during the previous year. Only a trace of white rot of onion (Sclerotium cepivorum) was found in one field. This is in contrast to the years 1962 and 1965, when July mean temperatures

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1 Contribution No. 76 from Research Service, Québec Department of Agriculture

2 Plant Pathologists, Research Service, Québec Department of Agriculture, 201 Crémazie Blvd East, Montréal 11, Qué.

3 Plant Pathologist, Research Station, Research Branch, Canada Department of Agriculture, St. Jean, Qué.

Table 2. Diseases in the muck soil area south of Montreal, Quebec, in 1966

Crop	Diseases	Disease intensity
CARROT	Alternaria leaf blight (Alternaria dauci)	7-tr. 9-sl. 4-mod. 1 sev./22 fields
	Cercospora leaf blight (Cercospora carotae)	9-tr. 9-81. 2-mod./22 fields
	Aster yellows (callistephus virus 1)	12-tr./22 fields
CELERY	Bacterial blight (Pseudomonas apii)	5-tr. 1-mod./12 fields
	Early blight (Cercospora apii)	3-tr./12 fields
	Late blight (Septoria apiicola)	1-tr./12 fields
	Aster yellows (callistephus virus 1)	9-tr./12 fields
	Manganese deficiency	7-tr./12 fields
	Boron deficiency	1-tr./12 fields
	Mosaic	5-tr./12 fields
	Pink rot (Sclerotinia sclerotiorum)	2-tr./12 fields
	Nematode root knot (Meloidogyne hapla)	1-tr./12 fields
LETTUCE	Aster yellows (callistephus virus 1)	1-tr./1 field
ONION	Leaf blight (Botrytis squamosa), may include an undetermined amount of leaf fleck (B. cinerea)	6-tr. 8-sl. 1-mod. 1-sev./22 fields
	White rot (Sclerotium cepivorum)	1-tr./22 fields
	Purple blotch (Alternaria porri)	4-tr. 3-mod./22 fields
	Pink root (Pyrenochaeta terrestris)	1-tr./22 fields
	Fusarium bulb rot (Fusarium oxysporum f. cepae)	7-tr./22 fields
	Smut (Urocystis magica)	6-tr./22 fields
POTATO	Black leg (Erwinia atroseptica)	6-tr./15 fields
	Early blight (Alternaria solani)	8-tr. 2-sl./15 fields
	Late blight (Phytophthora infestans)	1-tr. 2-sl. 1-sev./15 fields
	Rhieoctonia (Rhizoctonia solani)	6-tr./15 fields
	Verticillium wilt (Verticillium albo-atrum)	2-tr./15 fields
RADISH	Downy mildew (Peronospora parasitica)	1-tr./1 field

lower than normal seemed to favour outbreaks of this disease (4). Unfamiliar lesions attributed to the wilt organism (Verticillium albo-atrum) were observed on tubers in two potato fields.

Discussion

It was generally observed that foliar diseases developed more extensively in 1966 than in the four previous years, particularly in 1965 when rainfall in July and August was much higher than during the corresponding months of 1966 (4). This year extensive leaf disease development was expected, since the June rainfall approximated the 29-year average. This was interpretedearlier as a factor favoring the early establishment of primary disease foci (2, 3, 4). Three instances of early disease development were observed in 1966. The first one involved the detection of alternaria blight in four carrot fields at the early date of June 23. The second involved a field of 'Copper Gem' onion well protected from wind where. leaf blight was detected on July 10 and later developed to a moderate intensity. In the third instance, an early planted field of 'Irish Cobbler' potato was severely affected by late blight in mid-August, when the disease was just starting to show on late varieties. However, leaf disease severity generally remained at a low level. This is attributed to the fact that the below-normal rainfall in the second part of June and during July prevented leaf diseases from reaching an epidemic stage except possibly in localized areas favorable to the establishment of the required microclimate.

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