Small fruits / Petits fruits

Crop / Culture: Blueberries

Location / Emplacement: Vancouver, B.C.

Title / Titre: SURVEY OF HIGHBUSH BLUEBERRIES FOR SCORCH VIRUSES

Name and Agency / Nom et Organisation:

S.G. MacDonald and R.R. Martin
Agriculture Canada
Research Station
6660 N.W. Marine Drive
Vancouver, B.C.
V6T 1X2

METHODS: In 1989 highbush blueberry (Vaccinium corymbosum) plantings in British Columbia, Washington and Oregon were surveyed for blueberry scorch carlavirus (Martin and Bristow, 1988) and a newly identified spherical virus from highbush blueberry. Each sample consisted of 3 or 4 fully mature leaves collected from different branches on a bush. Samples were tested by ELISA using polyclonal antisera to each of the two viruses. Samples were ground in 0.05 M borate, pH 8.0, containing 0.05% Tween-20, 0.1% non-fat dried milk and 0.5% nicotine alkaloid (MacDonald et al., 1989). Samples were considered positive if the A_{405} values were greater than twice the mean of negative controls (mean of 6 healthy samples). Any questionable results were retested.

RESULTS AND COMMENTS: The carlavirus was found in Pierce and Clark counties in Mashington and in Clackamas and Benton counties in Oregon. The newly identified spherical virus was found in Whatcom, Pierce and Clark counties in Washington and in Clackamas and Yamhill counties in Oregon. Neither of the viruses has been found in British Columbia despite extensive testing.

The spherical virus has been found in three fields in Whatcom county Washington, which is just across the border from the Fraser Valley in British Columbia. Both the carlavirus and spherical viruses move rapidly in blueberry fields and represent potential disease problems to the blueberry industry in British Columbia. Significant losses can be incurred with infection by either of the viruses in some cultivars of highbush blueberry.

Wild Vaccinium species and weeds in and around infected fields all tested negative for both scorch viruses. Since these viruses appeared in different areas at about the same time it is possible that these viruses moved into the area on infected planting stock. The carlavirus is very similar to a virus from Sheep Pen Hill diseased blueberries in New Jersey. The spherical virus is distinct from any other virus reported from blueberry. A virus certification program for blueberry planting stock using ELISA to test for these viruses along with more work on the epidemiology of these viruses will help prevent the movement of these viruses into the Fraser Valley. Early detection along with removal of infected bushes should be an effective means of controlling these diseases.

REFERENCES:

1. MacDonald, S.G., Martin, R.R., Gillet, J.M. and Ramsdell, D.C. 1989. Controlling the pH of blueberry sap for detection of viruses in blueberry leaves by ELISA. Acta Hortic. 236:37-43.

2. Martin, R.R. and Bristow, P.R. 1988. A carlavirus associated with blueberry scorch disease. Phytopathology 78:1636-1640.

Crop/Culture: Blueberry

Name and Agency/ Nom et Organisation: Leslie S. MacDonald
B.C. Ministry of Agriculture and Fisheries
17720 - 57th Avenue
Surrey, B.C.
V3S 4P9

Location/Emplacement: South Coastal British Columbia

Title/Titre: INCIDENCE OF HIGH BUSH BLUEBERRY DISEASES IN 1989 IN BRITISH COLUMBIA

METHODS: Results are based on 51 blueberry samples from south coastal B.C. which were submitted to the provincial plant diagnostic clinic at Cloverdale.

RESULTS AND COMMENTS: The five major diseases of highbush blueberry in 1989 were mummyberry (*Monilinia vaccinii-corymbosi*), grey mold (*Botrytis cineria*), Godronia canker (*Godronia cassandrae*), bacterial blight (*Pseudomonas syringae*) and crown gall (*Agrobacterium tumefaciens*) (Table 1). Bacterial blight, grey mold and winter injury commonly occurred on the same sample. Phytophthora root rot (*Phytophthora sp.*) is increasing while there was only an isolated incidence of Armillaria root rot (*Armillaria mellea*).

Non-pathogenic disorders of blueberries in 1989 included winter injury caused by low temperatures (-15°C) in early February, excessive pruning, fertilizer burn, deep planting and flooding.

Table 1. Incidence of highbush blueberry diseases in British Columbia's south coastal region in 1989.

Blueberry Diseases	Number of Samples	Per Cent of Samples[1]
Mummyberry (*Monilinia vaccinii-corymbosi*)	8	16%
Grey Mold (*Botrytis cineria*)	8	16%
Godronia canker (*Godronia cassandrae*)	6	12%
Bacterial Blight (*Pseudomonas syringae*)	6	12%
Crown Gall (*Agrobacterium tumefaciens*)	6	12%
Phytophthora root rot (*Phytophthora sp.*)	3	6%
Armillaria root rot (*Armillaria mellea*)	1	2%
Non-pathogenic Disorders		
Winter injury; frost	5	10%
Other	21	42%

[1] Based on 51 samples submitted to the B.C. provincial plant diagnostic clinic. Certain samples had more than one disease or disorder.

Crop / Culture: Cranberry

Location / Emplacement: Southwestern British Columbia

Title / Titre: SURVEY OF PRE- AND POSTHARVEST FUNGAL DISEASES OF CRANBERRY FRUIT

Name and Agency / Nom et Organisation:

H.S. Pepin and C.M. Prager
Agriculture Canada
Research Station
6660 N.W. Marine Drive
Vancouver, B.C.
V6T 1X2

METHODS: Five hundred ml samples were taken from each of three tote boxes of harvested cranberries per bog, varieties Stevens, Bergman and MacFarlane, from 18 wet-picked bogs and 1 dry-picked bog as they arrived at the central receiving station in Richmond, B.C. The farms sampled were chosen to represent all the main cranberry-growing areas in B.C. Four of the bogs were in the Pitt Meadows area, 2 near Fort Langley, 2 in the Iron River area on Vancouver Island, 1 in Delta and the rest from Richmond. The three samples from each farm or bog were bulked for examination. The bulked samples were weighed, total berries counted, rots separated from healthy, weighed and counted and separated into disease categories. The remaining healthy berries were stored in paper bags at 3°C for 30 days. The rots were again separated from healthy berries, weighed and counted and separated into disease categories. Percent rot was calculated using total numbers of berries versus number of diseased berries.

RESULTS AND COMMENTS: Preharvest fruit rots were in all samples, ranging from 1.46% to 15.51% and averaging 6.33%. The dry-picked bog had 6.12% rot. Rots found were similar in both wet and dry-picked bogs. The most prevalent rot was end rot (Godronia cassandrae f. vaccinii Groves), closely followed by early rot (Phyllosticta vaccinii Earle). Both these rots occurred in all fields. Viscid rot (Diaporthe vaccinii Shear), black rot (Apostrasseria lunata (Shear) Nag Raj), yellow rot (Botrytis sp.) and Gibbera berry speckle (Gibbera myrtilli (Cooke) Petr.) occurred in trace amounts in a few fields. There was no correlation between causal agent, location of field or variety.

Postharvest rots followed a similar pattern with the same rots in the same order of occurrence. In addition, wet-picked fruit suffered considerable physiological breakdown with up to 50% of the fruit undergoing softening and juice loss. No organisms were isolated from this type of fruit. In contrast, dry-picked fruit did not break down but remained firm and in good condition.

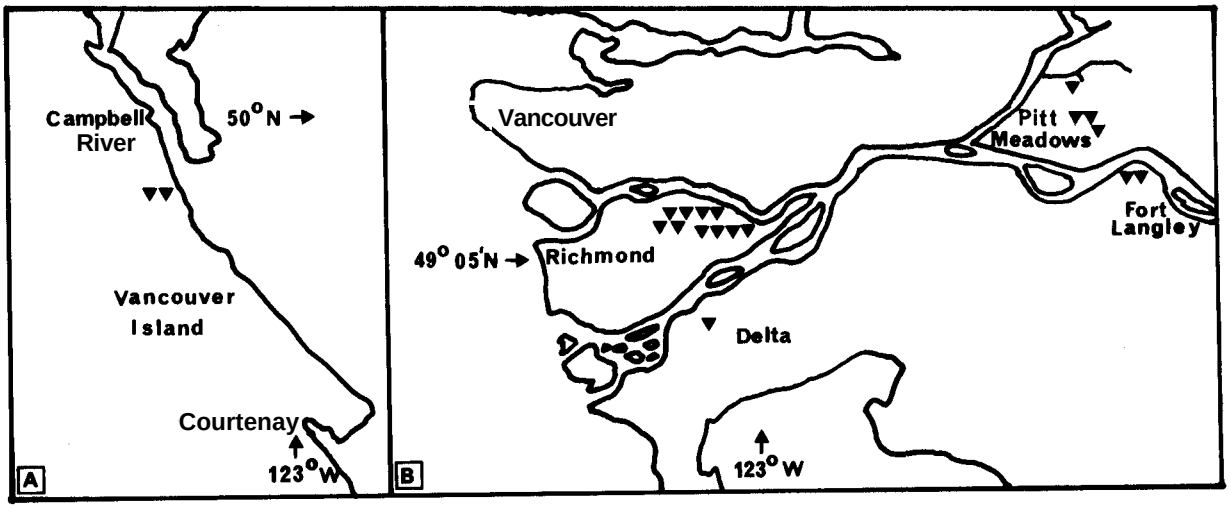

Fig. 1. Maps of locations of cranberry bogs sampled. A, Vancouver Island. B, Lower Fraser Valley.

Crop / Culture: Saskatoon, Amelanchier alnifolia

Location / Emplacement: Alberta

Title / Titre: SURVEY FOR DIEBACK AND CANKER DISEASE OF SASKATOON CAUSED BY CYTOSPORA SP.

Name and Agency / Nom et Organisation:

R.A. Pluim, R.J. Howard*, J.P. Tewari and N.R. Knowles
Department of Plant Science
University of Alberta
EDMONTON, Alberta
T6G 2P5

*Alberta Special Crops and
Horticulture Research Center
Brooks, Alberta
TOJ OJO

METHODS: Saskatoon orchards in the south central, north central and Peace River regions of Alberta were surveyed in the summers of 1988 and 1989. Twelve orchards were examined in 1988 and eleven orchards were surveyed in 1989. A systematic sampling technique was used in which every tenth bush was examined and rated as having the disease based on symptoms of dieback, exfoliation, canker, shrivelled bark, flagging and/or the presence of pycnidia. Disease severity was rated numerically according to the number of main branches affected: 0 = no disease; 1 = 1% to 25%; 2 = 26% to 50%; 3 = 51% to 75%; 4 = 76% to 100%. Random samples from each site were collected and returned to the laboratory for isolation and identification of the pathogen.

RESULTS AND COMMENTS: Dieback and canker disease caused by Cytospora leucostoma was observed in all orchards surveyed. Data collected over two years indicated that the incidence was highest in south central Alberta (Table 1). However, statistical analysis showed that there were no significant differences among areas while the variation among orchards within an area was highly significant. The frequently observed symptoms were branch tip dieback and diffuse cankers with pycnidia.

General observations suggest that the incidence of the disease may be associated with drought stress, mechanical injury from harvesting equipment and pruning wounds and low temperature injury.

Table 1. Incidence and severity of dieback and canker disease in Alberta 1988 and 1989.

Area Surveyed	Incidence (%)	Severity (% bushes per category)				
		0	1	2	3	4
S. Central	31	64	23	7	2	3
N. Central	18	82	11	3	1	3
Peace River	16	86	11	1	0	1

Name and Agency / Nomet Organisation: C. R. Bell
Department of Biology
Acadia University
Wolfville, NS
B0P 1X0

Crop / Culture: Grapes

Location / Emplacement: Nova Scotia

Title / Titre: Crown gall disease survey in Nova Scotia vineyards.

Method: In January 1989 a questionnaire was circulated to the 51 grape growers registered in the Nova Scotia Grape Acreage Survey, 1988 (NS Department of Agriculture and Marketing, Truro). The mailing included a description of crown gall disease (caused by *Agrobacterium tumefaciens*) taken from Tho Compendium of Grape Diseases published by the American Phytopathological Society, 1988. The one page questionnaire asked the growers to enter the varieties of grapes planted in their vineyards, to assess if crown gall was present and if present to estimate the extent of the damage.

Results and Discussion: 37 growers (37%) returned the questionnaire in the stamped/addressed envelope provided. Four respondents had discontinued growing grapes anti were not included in subsequent analyses. Fourteen growers (42.5%) of the remaining 33 respondents reported that crown gall was not present in their vineyards. Five growers (15%) declared that they were not sure and 14 (42.5%) said they definitely had crown gall.

The extent of the disease in this latter group and the varieties infected are tabulated below:

Grower	Percentage of specific vines infected	Percentage of vine death attributable to crown gall
1	Seyval (5%), Reisling (90%) Bacchus (100%)	90%
2	Baco Noir (4%), Castel (6%)	80%
3	Foch (1%)	1%
4	Seyval (<1%), Foch (<1%), Baco Noir (3%)	1%
5	Foch (5%), Baco Noir (13%)	3%
6	Seyval (<1%), Foch (1%), Michurinetz (1%), Chardonnay (60%)	100%
7	Baco Noir (20%)	100%
8	N.Y. Muscat (10%), Baco Noir (50%), Van Buren (80%)	0%
9	Seyval (10%), Cabernet (100%)	100%
10	Foch (20%)	80%
11	Michurinetz (<1%)	0%
12	Foch (60%)	
13	Castel (77%), N.Y. Muscat (100%), Bacchus (100%), Pinot Noir (100%), Chardonnay (100%)	50%
14	Foch (2%), Seyval (2%), L'Acadie Blanc (5%), Reisling (60%), Chardonnay (100%)	100%

The susceptibilities of the varieties planted in Nova Scotia appear to be following patterns observed in other wine growing regions. *Vitis vioifera* cultivars and the French hybrids are the most heavily infected. In 7 of the vineyards crown gall disease is rated as the major cause of vine death.

When the analysis was extended to include the 14 crown gall free vineyards some features emerged which may be unique to the Nova Scotian situation. The table below outlines these features.

Continued:

Three groups emerge with different susceptibilities to crown gall. The first group comprising varieties from Bacchus to Foch carry infection in 235% of all vineyards. The second group of L'Acadie Blanc, N.Y. Muscat and Seyval are only infected in 20-30% of the vineyards. These cultivars are known to be susceptible and their low infection rate is probably more a reflection of recent plantings. The final group from Dechaunac to Michurinetz may be enjoying some measure of resistance to crown gall as only a maxinum of 9% of the vineyards reported infection in these varieties. Certainly the data for the Russian hybrid Michurinetz is significant because it is the most popular grape variety grown in the province; an estimated 49.1 acres in a total vine acreage of 176.5. Presumably the resistance is afforded by having *V. amurensis* in the parents. The preponderance of this cultivar may help to contain the spread of crown gall in the province's vineyards.

Variety	No. of vineyards with crown gall absent in the variety	No. of vineyards wilh crown gall present in in the variety	Ratio present/ total
Bacchus	0	2	2/2
Cabernet	0	1	1/1
Van Buren	0	1	1/1
Chardonnay	4	3	3/7
Baco Noir	7	5	5/12
Castel	3	2	2/5
Reisling	2	2	2/4
Foch	12	7	7/19
L'Acadie Blanc	4	1	1/5
N.Y. Muscat	8	2	2/10
Seyval	14	5	5/19
Dechaunac	4	0	0/4
Pollux	2	0	0/2
Vidal	1	0	0/1
Severnyji	1	0	0/1
Michurinetz	20	2	2/22

The author gratefully acknowledges the support of the Canada/NS Agri-Food Development Agreement and the staff at the Kentville Agriculture Centre.