SUSCEPTIBILITY OF CRABAPPLE CULTIVARS TO ATTACK BY THE CODLING MOTH

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ABSTRACT

A repository block of ornamental crabapples containing 87 cultivars was left unsprayed and evaluated for resistance to the colding moth, *Laspeyresia pomonella* (L.). Although there were considerable differences in susceptibility, none of the cultivars was resistant to codling moth attack. A number of trees escaped injury from the first generation, but all showed entries from the second generation in August.

INTRODUCTION

Crabapples have long been known as hosts of the codling moth, *Laspeyresia pomonella* (L.) (Buckhurst 1921; Quist and Ward 1976).

Recent developments in codling moth control by the sterility method and the possibility of eradication (Proverbs 1971) makes reinfestation from hosts such as crabapples an important factor since they are commonly used on streets and in gardens as ornamentals. A crabapple cultivar resistant to codling moth would be desirable as an ornamental in apple producing areas and would greatly reduce an important source of infestation. Cutwright and Morrison (1935) have discussed varietal susceptibility of apples to codling moth and de Sarasola (1976) reported an apple cultivar, resistant to codling moth, which was developed from crabapple.

The Research Station, Summerland, maintains a crabapple repository containing 87 cultivars and this paper reports on their susceptibility to attack by the codling moth.

MATERIALS AND METHODS

The crabapple cultivar orchard is a 2.4 m x 2.4 m planting with 87 cultivars randomly distributed. One side adjoins a block of young apple trees and the other three sides face open fields. The orchard receives an annual routine codling moth spray, but no sprays were applied in 1979. Two sex pheromone traps were installed in the orchard to monitor codling moth populations, and moths were recorded and removed from the traps weekly. During the season, a total of 62 first generation males and 85 second generation males were captured. This level was considered high enough to ensure an infestation.

It was recognized from the outset that there would be differences in susceptibility to codling moth attack by the different cultivars due to a number of factors. These included time and density of fruit set, fruit size, relative firmness of fruit, fruit color, and thickness of epidermis. Since we were looking for complete resistance to codling moth, any cultivar that showed infested fruit from either first or second generation codling moth was rated as susceptible. It was not possible to secure data on relative susceptibility of the cultivars because each cultivar was represented by only one tree, consequently there were no replicates. As the crabapple fruits were either purple or green, the role of these two colors in susceptibility was also evaluated.

The trees were carefully examined for codling moth entries at 2 periods during the season, the first, after 10 July for first generation entries and the second, after 20 August for second generation entries. The number of fruit per tree were quite variable, therefore we searched for entries for 30 minutes on each tree, from the ground and from a ladder. The number of entries were recorded for each cultivar and a sample of infested fruit was collected from each tree and dissected to ensure that codling moth larvae were present in the infested crabapples.

RESULTS AND DISCUSSION

The crabapple cultivars and the number of codling moth entries are summarized in Table 1. None of the 87 cultivars showed resistance to codling moth although there was considerable variation in the number of entries. A few of the cultivars failed to set fruit and two trees (*M. Scheideckeri* and Red Jade) showed no larval entries, but had been damaged by cultivating equipment and the tree limbs were prostate on the ground. Several cultivars had no first brood entries and most of these had either very small fruit or very hard fruit. None of the cultivars escaped injury from the second generation.

Color did not play a role in susceptibility, as entries in red-purple cultivars were not significantly different at the 5 percent level from green varieties (one-tail T test $P < 0.05$).

Since none of 87 crabapple cultivars was resistant to codling moth, the chance of finding

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a resistant cultivar seems remote. Some of the crabapples that had relatively few entries might be more vulnerable had they not been in proximity to apparently preferred cultivars.

TABLE 1. Susceptibility of crabapples to attack by the codling moth.

Variety	Fruit color	Fruit set	Codling moth entries: generation 1[a]	Codling moth entries: generation 2[b]
M. *Hillieri*	green	heavy	0	6
Mary Currelly	purple	medium	5	6
Dolgo	green	heavy	3	7
Almey	purple	medium	6	9
M. *Sargentii*	green	medium	1	13
Makamik	purple	medium	1	12
Sissipuk	purple	medium	0	7
M. *purpurea Lemoinei*	purple	medium	1	2
Ferril's Crimson	purple	medium	2	3
Wisley	purple	medium	3	2
Geneva	purple	light	0	2
Van Eseltine	no fruit	-	-	-
Amisk	purple	medium	1	8
Sundog	purple	medium	1	24
Tomiko	no fruit	-	-	-
M. *purpurea Aldenhamensis*	purple	light	2	4
Prairie Rose	green	light	0	2
Cowichan	purple	heavy	2	26
M. *Scheideckeri*[c]	green	medium	0	0
Dorothea	green	medium	2	9
Hopa	purple	light	1	8
M. *floribunda rosea*	purple	medium	2	16
M. *spectabilis* 33-15	green	heavy	0	5
Garnet 33-28	green	light	0	8
M. *fusca* 33-30	purple	medium	1	6
M. *transitoria* 33-17	green	medium	7	42
M. *purpurea*	purple	medium	3	71
M. *spectabilis plena*	green	light	1	11
M. *robusta persicifolia*	green	medium	8	74
M. *brevipes*	green	medium	3	63
M. *robusta fastigiata*	green	medium	0	7
Profusion	purple	heavy	0	11
Kingsmere	purple	medium	2	3
Oekonomierat Echtermeyer	green	heavy	2	19
Cheals Crimson	green	heavy	7	31
Purple Wave	purple	medium	0	3
Irene	green	medium	9	45
M. *Columbia*	green	heavy	3	47
M. *baccata mandshurica*	purple	heavy	1	2
M. *spectabilis* 33-33	green	heavy	0	11
M. *spectabilis Riversii*	green	heavy	9	105
M. *denticulata*	green	medium	8	103
M. *Soulardii*	green	medium	5	119
M. *micromalus*	no fruit	-	-	-
Wabiskaw	purple	medium	3	25
M. *pumila paradisiaca foleus aureus*	green	heavy	0	5
Prince George's	green	heavy	3	76
Linda	green	heavy	0	37
Jay Darling	purple	light	0	5
M. *ioensis*	green	light	2	8

Variety	Fruit color	Fruit set	Codling moth entries	
			generation 1[a]	generation 2[b]
Yellow Siberian	green	medium	11	77
Oporto	purple	heavy	1	26
M. sylvestris plena	green	medium	0	35
M. sylvestris	green	medium	14	169
M. prunifolia macrocarpa	green	medium	15	187
M. robusta erecta	green	medium	2	36
Kings Crab	green	light	0	13
Marshall Oyama	green	heavy	10	116
Wynema	green	medium	2	137
Liset	purple	heavy	3	13
Pattie	green	heavy	10	205
Patricia	purple	light	16	4
Evelyn	purple	light	0	2
Flame	green	heavy	2	17
Veitch's Scarlet	no fruit	-	-	-
Crimson Brilliant	purple	heavy	6	24
Sutherland	purple	medium	0	3
Strathmore	purple	light	4	64
Red Silver	purple	light	0	3
Stirling Apple	green	medium	2	36
Selkirk	purple	heavy	13	52
Garry	purple	medium	11	7
M. coronoria Charlottae	no fruit	-	-	-
Leslie	purple	medium	3	8
Jubilee	purple	medium	5	34
Red Jade[c]	purple	medium	0	0
55-71080	purple	light	0	6
55-62-117	purple	medium	0	44
55-62-114	purple	medium	0	43
55-74-02	green	medium	5	35
55-58-116	purple	heavy	0	37
Exzellenz Thiel	no fruit	-	-	-
31-0-91; 59-82-01	green	medium	1	4
30-8-65; 55-61-06	green	heavy	3	9
no name	green	light	4	9
no name	green	light	1	7
Royalty	no fruit	-	-	-

[a]Examined in the field starting July 10.

[b]Examined in the field starting Aug. 20.

[c]Tree damaged, limbs prostrate on ground.

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