INCIDENCE OF GREEN PETAL DISEASE IN SOME STRAWBERRY CULTIVARS AND SELECTIONS IN PRINCE EDWARD ISLAND, 1970-71[1]

L.S. Thompson and J.A. Cutcliffe [2]

Abstract

A total of 23 strawberry cultivars and selections, exposed to natural infection in replicated variety trials at Charlottetown, Prince Edward Island, were rated in 1970 and 1971 for the presence of green petal disease. The cultivars Gorella, Veestar, and Vibrant, the Kentville selections K60-98 and K64-462, and the Ottawa selection 55-01-01 exhibited the lowest incidence of geen petal infection.

Introduction

Green petal disease of strawberries was apparently observed for the first time in Prince Edward Island in 1961. The disease was particularly severe in some fields from 1961 to 1967 (3, 4), but it has since occurred only sporadically in commercial strawberry plantings. In 1971 green petal could be found in almost all strawberry fields in Prince Edward Island, but the level of infection was usually low. A survey of first crop plantings conducted in 1971 indicated averages of 1.8, 2.7, and 7.5% infected plants in the cultivars Cavalier, Redcoat, and Sparkle, respectively. Second and third crop plantings usually had fewer infected plants than first year crops.

In the Maritime Provinces higher levels of infection have been observed in Sparkle than in Redcoat or Cavalier (1, 2, 4). These three cultivars have been the most extensively grown in recent years in Prince Edward Island, but Sparkle is rapidly losing favor because of small berry size, susceptibility to green petal, and its poor hulling characteristic.

In 1966, Willis and Thompson (4) noted that the lowest levels of green petal infection in replicated strawberry variety trials at Charlottetown occurred in the cultivars Fletcher and Siletz and in the Kentville selection K-59-8. In a field test at Oxford, Nova Scotia, Gourley et al. (2) reported that the cultivars Redcoat and Elista, and the Kentville selection K-63-280 showed less infection with green petal than the other 10 cultivars and selections exposed to natural infection.

Materials and methods

Strawberry plants in replicated variety evaluation trials at the Research Station, Charlottetown, were rated in 1970 and 1971 for the presence of green petal disease. Plants for both trial plots were raised in a screenhouse at the CDA Research Station Kentville, Nova Scotia, then set out in variety evaluation plots at Charlottetown in 1969 and 1970. Cultivars and selections were arranged in randomized blocks of 10 plants per plot with plants 2 feet apart in rows 4.5 feet apart. Plots were allowed to form matted rows. DDT plus malathion dusts were applied to all plots every 10 days during the first growing season, and the following year DDT alone was applied once for weevil control. Yield data were recorded as the fruit matured. Fruit was considered unmarketable when it was malformed, damaged by rot, or mechanically damaged.

In 1970, disease incidence was evaluated by visually rating each plot on a 0 to 9 basis. A rating of 0 indicated freedom from green petal while a rating of 9 represented 100% infection. In 1971, the total number of plants in each plot was counted, and the number of plants showing symptoms of green petal was recorded as a percentage. Disease ratings were made at harvest time in July each year.

Results and discussion

The mean ratings or percentages of green petal for each of the 23 cultivars and selections are given in Table 1. A considerable range of green petal infection was apparent among cultivars and selections in both years. Gorella, Veestar, Vibrant, K60-98, K64-462, and Ottawa 55-01-01 exhibited the lowest incidence of green petal infection. Red Chief, which exhibited the highest number of infected plants in 1971, was uniformly infected throughout each plot, while adjacent plots of other cultivars and selections generally had much lower infection

---

[1] Contribution No. 246, Research Station, Canada Department of Agriculture, Charlottetown, Prince Edward Island.

[2] Entomologist and Horticulturist.

Table 1. Green petal infection and fruit yield in strawberry cultivar and selection trials, Charlottetown, Prince Edward Island

Cultivar	1970 Trial		1971 Trial		
	Green petal index*	Yield marketable fruit lb/20-ft plot	No. plants per 20-ft plot	% plants infected†	Yield marketable fruit lb/20-ft plot
Acadia	1.7	35.0			
Cheam			348	3.1	24.6
Gorella	0.5	32.3			
Guardian			311	6.8	24.8
K60-98	0.5	37.5			
K64-401	1.3	20.9	481	2.3	33.3
K64-405	5.0	22.3	308	6.0	28.9
K64-436	3.3	41.1	344	4.0	34.3
K64-462	0.5	48.6	343	0.8	34.5
K65-253			300	5.6	26.5
K65-436			176	12.6	13.1
Midway	2.8	27.1	288	6.1	26.1
Ott. 55-01-01	1.0	39.4	549	1.9	39.8
Ott. 55-02-04	1.0	20.2	349	2.9	23.3
Raritan	2.8	21.8	258	3.4	33.8
Red Chief			393	20.2	23.2
Red Coat	1.3	24.2	347	2.9	30.3
Senga Sengana	1.3	41.9			
Sparkle	3.2	22.3			
Surecrop	2.7	27.3	243	8.0	25.2
Veestar	0.3	31.2	513	0.3	39.8
Vesper	2.5	39.2			
Vibrant	0	33.7	508	1.4	36.0

* Mean green petal indices 0 = none, 1 = trace, up to 9 = 100% infection; based on observations of from 3 to 6 replications.

† Mean percent of total plants per plot showing green petal symptoms; based on counts of 4 replications.

ratings. This suggests that Red Chief is a highly susceptible cultivar and discounts border effects. Other cultivars and selections exhibiting high incidence of infection were Surecrop, Sparkle, K65-405, K64-436, and K65-436.

These findings indicate that certain strawberry cultivars have some resistance or tolerance to the green petal disease-causing organism, or that there is a leafhopper vector preference for one variety over another. The breeding of resistant or tolerant cultivars offers the greatest potential as a practical control of the green petal disease. In view of this, some of the cultivars showing resistance to green petal in these and other trials should be incorporated in vector-cultivar transmission studies under controlled conditions to help elucidate these findings. Meanwhile, in areas where green petal is a problem, commercial strawberry plantings should be of cultivars which have good horticultural characteristics and which have been shown to exhibit low levels of green petal infection under natural field conditions.

Literature cited

1. Collins, W. B., and G. T. Morgan. 1958. Green petal of strawberry in New Brunswick. Plant Dis. Rep. 42:339-341.
2. Gourley, C. O., G. W. Bishop, and D. L. Craig. 1971. Susceptibility of some strawberry cultivars to green petal. Can. Plant Dis. Surv. 51:
3. Stultz, H. T., and A. A. MacNab. 1970. Incidence of green petal disease in cultivated strawberry in the Maritime Provinces in 1967. Can. Plant Dis. Surv. 50:46-47.
4. Willis, C. B., and L. S. Thompson. 1966. Observations on strawberry green petal in Prince Edward Island. Can. Plant Dis. Surv. 46:137.