Section IV.
Biological & Cultural Control

RUBUS RESISTANCE TO SPIDER MITES

Carl H. Shanks, Jimmie D. Chamberlain, and Jeannette R. Bergen
Washington State University, Research & Extension Unit
1919 N.E. 78th St.
Vancouver, WA 98665-9752
206/576-6030

Spider mites are a common problem on red raspberries, *Rubus idaeus*, especially after use of certain insecticides. Studies were conducted to search for clones of red raspberry or other *Rubus* species that are resistant to twospotted spider mite, *Tetranychus urticae*.

Previous research had shown that the red raspberry advanced selection, WSU 968, and 'Dormanred' (1/4 red raspberry, 3/4 *R. parvifolius*) were mite-resistant. Work in 1994 confirmed this and showed that fruiting canes and primocanes were both resistant (Table 1).

WSU 968 was crossed with four red raspberry clones and the seedlings were tested for resistance to spider mites in the greenhouse. The cross 'Brandywine' x WSU 968 yielded the highest percentage (44%) of mite-resistant seedlings (Table 2).

The parents of the crosses shown in Table 2 plus three other red raspberry clones were compared for mite resistance. WSU 968 had only 46% as many mites during the entire season as the next most resistant clone, WSU 530 (Table 3). 'Willamette' and 'Meeker', the most widely grown red raspberries in the Pacific Northwest, were the two most susceptible clones.

A field planting of 151 clones of *Rubus* spp. was evaluated for resistance to spider mites. Nine clones had <50% as many mites as did 'Willamette' (Table 4). WSU 822 was extremely resistant but is only one-half red raspberry. It should be useful in the breeding program. 'Goldenwest', a yellow-colored red raspberry was also very resistant and should be useful in the breeding program.

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Table 1. Spider mite numbers on some red raspberry clones and 'Dormanred'*.

Clone	Total mites/sq. cm.. 1993**		Total mites/sq. cm., 1994	
	Fruiting canes	Primocanes	Fruiting canes	Primocanes
Willamette	15.5a	11.5a	31.5a	19.9a
Haida	15.6a	9.4ab	24.8a	22.7a
WSU 968	7.3b	5.0b	3.4b	4.1b
Dormanred	5.6b	4.1b	2.8b	5.1b

*'Dormanred' is 1/4 red raspberry and 3/4 *Rubus parvifolius*.

**Means followed by the same letter are not significantly different (Tukey's HSD test, P=0.05).

Table 2. Resistance of progeny of red raspberry selection, WSU 968, to the twospotted spider mite, 1994.

Cross	No. seedlings	No. of seedlings with less than 30% of the number of mites on 'Willamette'		
		Count #2*	Count #3**	Count #4***
WSU 530 x WSU 968	18	13	4	1
WSU 991 x WSU 968	50	47	1	1
Brandywine x WSU 968	50	20	8	22
Schonemann x WSU 968	82	55	23	4

*Aug. 8 & 20; 361 mites per 'Willamette' leaflet.

**Aug. 8 & 20 & Sept. 6; 604 mites per 'Willamette' leaflet.

***Aug. 8 & 20 & Sept. 6 & 19; 764 mites per ' Willamette' leaflet.

Table 3. Spider mite populations on red raspberry clones, 1994.

Cultivars & selections	Total no. mites per 3 leaflets		
	Counts # 1 & 2*	Counts # 1-3**	Counts # 1-4***
WSU 968	63	246	486
WSU 530	317	674	1047
Newburgh	527	827	1083
Schonemann	452	833	1121
WSU 991	532	893	1188
Brandywine	1103	1320	1357
Meeker	686	1243	1451
Willamette	1083	1813	2291

*Aug. 8 & 20.

**Aug. 8 & 20 & Sept. 6.

***Aug. 8 & 20 & Sept. 6 & 19.

Table 4. Mite numbers on some *Rubus* clones in a field planting, Puyallup, WA, 1994.

Clone*	No. mites/ 3 leaflets**	% of 'Willamette'
WSU 822***	18	9
Goldenwest	25	12
WSU 1049 BR****	42	20
R. parvifolius 'Cherry'	48	24
September	62	31
St. Regis (Ranere)	65	32
WSU 805	70	34
BC 74-11-41	77	38
Dormanred	98	48
Willamette*****	204	100

*All are red raspberry unless stated otherwise. There were 141 other clones that had much higher numbers of mites.

**Total for 4 counts made August 2, 16, & 30 . & September 13

***'Meeker' x *R. morifolius*

**** *R. strigosus* x 'Mt. Mitchell'.

*****Mite-susceptible clone for standard.