CULTIVAR BY HERBICIDE INTERACTIONS IN NEWLY PLANTED RASPBERRIES

M.J. HARTLEY

Hawkes Bay Agricultural Research Centre, MAF, Box 85, Hastings

Earlier work on weed control in newly planted raspberries reported an inconsistent response by different raspberry cultivars to different herbicides, indicating a cultivar by herbicide interaction (Hartley and Loader 1985). In order to investigate this possibility, a further trial was set up in 1985 to test three herbicides on four cultivars of raspberry.

Raspberry plants were established in late July 1985 from dormant rooted suckers, planted 20 cm apart in sub-plots 2 m long (10 plants) with a 2 m gap between plots. Rows were 3 m apart with a 1.5 m grass strip between rows. The soil type was Mangateretere silt loam.

The trial was a fully randomised, split plot design with four cultivars of raspberry replicated four times on main plots. Three herbicides, each at two rates, plus two hand-weeded treatments were applied on sub-plots, giving a total of 128 sub-plots.

The cultivars selected were Marcy, Skeena, Nootka and Fairview with Marcy guard plots along each side and both ends of the trial block. Marcy and Fairview are the most commonly grown cultivars and Skeena is promising for machine harvesting. Nootka had given inconsistent results in the earlier work. The three herbicides, simazine (Gesatop), terbacil (Sinbar) and terbuthylazine (Gardoprim) were applied by precision sprayer in 200 litres water/ha at 230 kPa, directly over the dormant suckers in a band 1.5 m wide in July 1985. Treatments were reapplied in July 1986 as a directed spray to each side of the plot. Sucker growth was controlled by dinoseb 0.7 kg ai/ha (Sinox PE) plus crop oil and mowing. Routine fungicide and insecticide treatments were applied as necessary.

Weed cover and cane vigour were assessed visually in October 1985 and all plots were kept weed free thereafter by hand weeding and/or directed paraquat application. Cane height was measured in January 1986 and fruit yield recorded in December/January 1986/87.

TABLE 1: Weed control and mean first year cane growth of raspberries following treatment with three herbicides.

Treatment kg ai/ha	Weeds (% ground cover) Oct. 1985	Raspberry vigour** Oct. 1985	Cane ht.(m) Jan. 1986
untreated/handweeded	53	6.5	1.06
simazine 2	15	6.5	1.07
simazine 4	4	7.2	1.14
terbacil 1	7*	6.3	1.10
terbacil 2	1*	7.0	1.17
terbuthylazine 3	5*	6.5	1.13
terbuthylazine 6	3*	6.6	1.11
LSD 5%			0.068

* Twin cress and wart cress only

** Vigour scale : 10 = good growth, 0 = no new cane; means of four cultivars

Table 1 shows the weed cover present in October 1985. Thereafter all plots were kept weed-free. Terbacil and terbuthylazine controlled all weeds except twin cress (*Coronopus didymus*) and wart cress (*C. squamatus*). Simazine gave good general weed control at 4 kg ai/ha but not at 2 kg ai/ha. The degree of weed competition before weeds were removed in October did not appear to have any effect on cane vigour visually estimated at that time (Table 1). However, cane growth in January 1986 (Table 1) was best on all treatments with good early weed control except for that using the

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higher rate of terbuthylazine. To ascertain if these differences in cane vigour recorded in January were due to early weed competition, a small auxillary trial was conducted in 1986. Ten plots were planted with Marcy as before. Five were treated with terbacil, 2 kg ai/ha, and five kept carefully hand weeded. There was no difference in cane growth in February suggesting the earlier effect was due to early weed competition.

Raspberry yields are shown in Table 2. There was no significant difference in fruit yield between herbicide rates so the mean for both rates is shown. None of the herbicide treatments gave a yield significantly different from hand weeded within any cultivar though there were large differences in yield between cultivars.

TABLE 2: Yield (t/ha) of raspberry cultivars following different herbicide treatments.

Treatment	Cultivar			
	Marcy	Skeena	Nootka	Fairview
hand weeded	7.8	9.5	2.4	4.7
simazine	7.1	10.5	3.1	5.2
terbacil	8.1	9.7	2.7	5.6
terbuthylazine	8.5	9.2	2.8	5.7
LSD between herbicides	5% = 1.03			
	1% = 1.37			

There was a significant interaction ($P < 0.05$) between cultivar and herbicide. The yield of Marcy was significantly higher ($P < 0.01$) following treatment with terbuthylazine than after treatment with simazine. Conversely, Skeena yield was significantly higher ($P < 0.05$) following treatment with simazine than treatment with terbuthylazine.

This type of herbicide by cultivar interaction does not appear to have been reported before for fruit crops, although differential sensitivity between cultivars of cereals to different wild oat (*Avena* spp) herbicides is well known (Fryer and Makepeace 1978). The difference in cultivar response to simazine and terbuthylazine found in this trial was unexpected, particularly as they are, chemically, closely related. Nevertheless these results suggest that all raspberries will not respond equally to all herbicides. For best establishment of new raspberry plantings it may be necessary to select a herbicide for both weed control and safety on the raspberry cultivar to be treated.

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