(4). Various fruit color and russet mutants of 'Bartlett' have been recognized and propagated. Red-fruited mutants of 'Bartlett' include 'Cardinal Red,' 'Sensation,' and 'Rosired.'

Despite the fact that 'Bartlett' was discovered almost 200 years ago, none of its offspring or sports seem destined to replace it as the world's preeminent pear cultivar.

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Red Raspberry Yield Trials In Southwestern and Western Montana

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Abstract

Seven red raspberry cultivars were evaluated for yield potential at Bozeman and Corvallis, Montana from 1980-1982. All cultivar yields were markedly greater at Corvallis than at Bozeman. 'Killarney' and 'Boyne' were the most stable high yielding cultivars at Corvallis followed by 'Gatineau' and 'Canby'. 'Boyne' was the most stable high yielding cultivar at Bozeman. 'Latham' was consistently low yielding at both locations.

Introduction

The red raspberry (*Rubus idaeus* L.) is well adapted to most areas in Montana. It bears fruit early in the season and is among the hardiest of the cane fruits. Some cultivars can withstand -35 to -40°C with only minor tip die-back. However, injury may occur when root tissues reach -21 to -22.8°C (Shoemaker, 1978). Total plant death is rare, especially when winter protection is provided. Mulching or covering canes may reduce winter injury to red raspberries. 'Latham' has long been a standard red raspberry for regions with severe winter conditions. 'Canby' and 'Taylor' have also been popular. Other cultivars are recommended for cold areas, but have not been widely evaluated in Montana. The objective of this study was to evaluate the yield of several newer cultivars with 'Latham,' 'Canby,' and 'Taylor' in the Bitterroot and Gallatin Valleys of Montana.

Materials and Methods

Plots were established in April 1979 at the Western Agricultural Research Center, Corvallis, Montana, and the Horticultural Research Farm, Bozeman, Montana. A randomized complete block design with four replications was used at both locations. Rows were 2.1 m apart with plants spaced 0.6 m apart in the row. Raspberries were grown on a three-wire trellis at Corvallis and in a hedge system at

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Bozeman. 'Latham,' 'Canby,' and 'Taylor' were compared as standards with the cultivars 'Gatineau,' 'Boyne,' 'Killarney,' and 'Madawaska.'

Experiments at Corvallis and Bozeman were on a Burnt Fork loam and Bozeman silt loam, respectively, with good natural fertility and waterholding capacity. The pH of surface soils at Corvallis and Bozeman was 7.5 and 7.8, respectively. Both sites were fallowed the year before planting.

Nitrogen at 30 kg/ha was applied at the beginning of the first production year followed by applications of 60 kg/ha during succeeding years at both locations. Phosphorus and potassium at 112.1 and 98.7 kg/ha were applied before planting at Corvallis. No phosphorus or potassium fertilizer was applied at Bozeman.

The cultivars were grown according to conventional cultural practices. Irrigation during the establishment year was by overhead sprinkler at both locations. A trickle irrigation system was utilized at Corvallis the second year. Raspberries were harvested 4, 9, and 10 times in 1980, 1981, and 1982 at Corvallis, respectively, and 5 times each year at Bozeman.

Results

'Boyne' was the highest yielding cultivar in 1980 at Corvallis (Table 1). 'Killarney,' was intermediate yielding and 'Gatineau,' 'Madawaska,' 'Taylor,' 'Latham,' and 'Canby' had the lowest yields. Vigor of 'Canby' was markedly less than the other cultivars in 1980.

Winter injury caused minor tip dieback in all cultivars in 1981 and 1982. 'Killarney' and 'Gatineau' yielded the highest in 1981 followed by 'Boyne,' 'Canby,' and 'Taylor.' 'Madawaska' and 'Latham' had the lowest yield in 1981.

Yields more than tripled for all cultivars except 'Boyne' between 1980 and 1981. Yields increased less markedly between 1981 and 1982. 'Killarney,' 'Gatineau,' 'Boyne,' and 'Canby' had the highest yields in 1982 followed by 'Madawaska.' 'Taylor' was intermediate yielding and 'Latham' had the lowest yield in 1982.

Table 1. Yields of seven red raspberry cultivars from 1980 through 1982 at Corvallis, Montana.

	Fruit Yield (mt/ha)		
	1980	1981	1982
Killarney	2.9 b[z]	11.9 a	12.2 a
Gatineau	2.0 c	12.5 a	11.3 a
Boyne	3.6 a	8.6 b	11.7 a
Canby	0.9 d	9.2 b	11.9 a
Madawaska	1.5 cd	6.2 c	10.5 b
Taylor	1.5 cd	7.6 b	8.7 c
Latham	1.6 cd	5.6 c	6.8 d

[z]Means within a column followed by the same letter are not significantly different at the 5% level using Newman-Keul's test.

'Boyne' had the highest yield in 1980 followed by 'Killarney' at Bozeman (Table 2). 'Gatineau,' 'Madawaska,' and 'Taylor' were intermediate yielding and 'Canby' and 'Latham' had the lowest yield. Winter injury caused tip die-back in all the cultivars grown at Bozeman in 1980, with 'Canby' exhibiting the greatest winter injury.

Yields more than tripled for all cultivars except 'Boyne' between 1980 and 1981. 'Killarney' and 'Boyne' had the highest yields in 1981 followed by 'Gatineau.' 'Canby,' 'Madawaska,' and 'Taylor' had intermediate yields and 'Latham' had the lowest yield. Winter injury resulted in severe damage to canes of 'Taylor' and 'Latham' in 1981.

Yields increased less markedly between 1981 and 1982. 'Boyne' had the highest yield followed by 'Killarney' in 1982. 'Gatineau,' 'Canby,' 'Madawaska,' and 'Taylor' had intermediate yields and 'Latham' had the lowest yield in 1982. Minor tip die-back occurred in all cultivars in 1982 at Bozeman.

Table 2. Yields of seven red raspberry cultivars from 1980 through 1982 at Bozeman, Montana.

	Fruit Yield (mt/ha)		
	1980	1981	1982
Killarney	1.3 b[z]	4.7 a	4.8 b
Gatineau	0.8 c	4.0 b	4.1 c
Boyne	1.6 a	4.5 a	6.1 a
Canby	0.3 d	2.9 c	3.5 d
Madawaska	0.7 c	2.7 c	3.8 cd
Taylor	0.9 c	2.6 c	3.6 cd
Latham	0.4 d	2.2 d	2.5 e

[z]Means within a column followed by the same letter are not significantly different at the 5% level using Newman-Keul's test.

Summary

Annual production of each cultivar at Bozeman was approximately less than half of the Corvallis yield. This has been generally observed at Corvallis and Bozeman with other fruit crops. Winter injury had a much greater effect on cultivar performance at Bozeman than Corvallis. 'Latham,' which is often found in the commercial trade, was consistently low yielding.

These data indicate that cultivars other than 'Latham' may have greater potential for production in Montana. Unfortunately, fruit quality and pest resistance were not evaluated in these studies. Further investigations are warranted in these areas with a thorough evaluation of plant vigor. Additionally, many newer cultivars from the Pacific Northwest and Canada are available and should be evaluated in Montana.

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Effects of Postharvest and Postbloom Sprays of Daminozide on Apples[1]

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Abstract

Application of 1500-3000 ppm butanedionic acid mono-(2,2-dimethylhydrazide) (daminozide) from mid-August to mid-October increased fruit set the following year on Mutsu, McIntosh, Cortland, Delicious, and Spencer apples. Fruit set was increased more from the carry-over effects from a fall treatment than from a postbloom spray. Fruit size and L/D ration were reduced following a fall treatment.

Introduction

Daminozide (Alar) is used to delay preharvest fruit drop on some apple cultivars (9, 11, 14). Applications made shortly after bloom also can reduce growth and fruit size and shorten pedicel length. The nearer daminozide is applied to harvest, the fewer detrimental effects it has on the harvested fruit (6, 11). When high rates of daminozide (2,000-4,000 ppm) are used or application is made late in the season, carry-over effects which include delayed bloom, reduced terminal growth, flattened fruit, reduced pedicel length and increased fruit set may occur the following year (6, 12). Therefore, the rate of daminozide used and its time of application have been adjusted to minimize negative fruit-effects the year of application and to minimize carry-over effects (11).

Early high yield in newly planted and vigorous older apple orchards is becoming increasingly important as

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