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Floricane Fruiting Red Raspberry Cultivars in the Pacific Northwest

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The Pacific Northwest is the leading producer of red raspberries in North America. Production in the Pacific Northwest is primarily located west of the Cascades concentrated in the Willamette Valley in Oregon, and in Northwestern Washington and Southwestern British Columbia. In 1989, there were over 14,000 acres in this region producing over 90,000,000 lbs of fruit with over 90% processed. All of the floricane fruiting cultivars of commercial importance in the Pacific Northwest were developed by programs in the region. Floricane fruiting raspberries and red raspberries that bear fruit only on second-year canes. There are three active red raspberry breeding programs in the Pacific Northwest, Agriculture Canada (Ag Canada) at Vancouver, British Columbia, Washington State University (WSU) at Puyallup, Washington, and the Oregon State University-United States Department of Agriculture (OR-US) program at Corvallis, Oregon.

The dominant cultivar for almost 40 years has been 'Willamette' (7). 'Willamette' was released by the OR-US breeding program in 1943 (9). 'Willamette' has dark purple-red fruit that is well suited to processing, originally developed for the canning industry, but now also used for the juice industry. Fruit are easily hand harvested and the plant is well suited to mechanical harvest. When it was released, 'Willamette' was considered to be a large-fruited and high yielding cultivar. Now, in comparison to newer cultivars, 'Willamette' is considered to have medium to small fruit and low yield. In the Pacific Northwest, 'Willamette' produces only a summer crop, and is the earliest of the major cultivars. In California, 'Willamette' produces a small fall crop later than 'Heritage.' Although 'Willamette' often has lower yields than more recently released cultivars, because of its reliable production and relative pest resistance 'Willamette' has continued to dominate the cultivar situation in the Pacific Northwest until recently. However, in four of the last six winters there has been damage to 'Willamette' that has been attributed to cold. As a consequence, growers, particularly in British Columbia, are removing plantings of 'Willamette' and replacing them with other cultivars. At this time, 20-25% of the acreage is 'Willamette.'

The cultivar replacing 'Willamette' is one of its offspring,'Meeker.' 'Meeker' was released by the WSU breeding program in 1967 (8). 'Meeker' is now the most widely planted cultivar in the Pacific Northwest and makes up 60% or more of the acreage. It is highly productive, and its fruit suited to either processing or the fresh market. The fruit of 'Meeker' are larger, ripens later and are lighter in color than those of 'Willamette.' 'Meeker' produces long fruiting laterals, but the fruit releases easily from the receptacle making it well suited to mechanical harvesting. 'Meeker' has shown some field tolerance to Phytophthora incited root rot, but is not highly resistant. Although there has been less winter damage on 'Meeker' than 'Willamette,'

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winter hardiness may restrict the planting range of 'Meeker.' In California, and other locations with very mild winters, 'Meeker' does not have uniform, vigorous bud break, perhaps a result of insufficient chilling.

Raspberry plantings commonly remain in production for many years so that it may require many years before a new cultivar becomes widely planted. 'Meeker' and 'Willamette' together account for over 80% of the raspberry acreage in the Pacific Northwest. The remaining acreage is divided among several minor cultivars. Three cultivars have been released by Ag Canada for commercial production in the western Pacific Northwest in the last four years. All three show promise, but have not established their position in the marketplace. 'Comox' (4) is one of the highest yielding cultivars, producing large, firm fruit suitable for processing or fresh market. It produces long fruiting laterals and its fruit does not release easily from the receptacle which may present problems for machine harvesting. 'Comox' is also relatively susceptible to root rot which may limit its adaptation. 'Chilliwack' was released at the same time as 'Comox' (4). 'Chilliwack' also produces large, firm fruit with excellent color suitable for fresh market or processing. Plants are vigorous and well adapted to mechanical harvesting. It may have some tolerance to root rot but is susceptible to crown gall. The yields of 'Chilliwack' are similar to 'Willamette.' The most recent release is 'Tulameen' (5). In research plots in British Columbia, 'Tulameen' has had yields similar to 'Comox,' but yields of 'Tulameen' in plots in Washington have been lower. In both areas it has produced extremely large fruit, larger than any other Pacific Northwest cultivar. The fruit have excellent flavor and fresh market color. It is relatively susceptible to winter damage, but has shown the ability to compensate and have high yields even after some winter damage. The fruit are easily hand harvested and releases easily from the receptacle, making it suitable for mechanical harvesting. In British Columbia, the end of its harvest season overlaps with the beginning of the season for fall fruiting cultivars. Although all three cultivars show potential, most of the new plantings are 'Meeker.' As growers gain experience with the new cultivars, plantings of these cultivars may increase.

Several cultivars are adapted to specific niches 'Chilcotin' (2) has been popular for the fresh market. It produces bright colored fruit and has a very long fruiting season. 'Chilcotin' is being replaced by cultivars that have larger and firmer fruit and have more flexibility in marketing for processing as well as fresh marketing. 'Skeena' (3) is an early season cultivar, ripening at the same time as 'Willamette.' It is cold hardy and has been grown successfully in Idaho. The fruit are lighter in color than other Pacific Northwest cultivars and less in demand by processors desiring dark colored fruit. It is highly susceptible to root rot and more susceptible to crown gall than other cultivars. 'Haida' (1) and 'Algonquin' (6) are winter hardy and may be suited to eastern British Columbia, Washington, and Oregon. Both cultivars are relatively small fruited.

Prospects for floricane fruiting cultivars in the Pacific Northwest.

The acreage of 'Willamette' will most likely continue to decrease, being replaced by 'Meeker.' There are no early season cultivars to replace 'Willamette' that are widely adapted with good processing characteristics. Root rot is becoming an increasing problem both on new and traditional raspberry sites. None of the Pacific Northwest cultivars combine acceptable fruit quality, high production and high levels of tolerance to root rot. 'Meeker' and 'Chilliwack' have exhibited the best levels of field resistance to root rot. More emphasis is currently being

placed on root rot tolerance in the breeding programs.

Cultivars that are not suited to mechanical harvesting and are adapted only to fresh marketing will not be successful in the future since the majority of the summer-bearing raspberry fruit in this region is mechanically harvested for processing. With decreasing labor availability and increasing labor costs, the proportion of mechanically harvested fruit will continue to increase. Adaptations to mechanical harvesting include easy release of fruit from the receptacle, strong attachment of laterals to the canes and concentrated ripening. Future cultivars must be adapted to both fresh market and processing or used specifically for processing.

The yields of 'Meeker' in Oregon and Washington and 'Comox' and 'Tulameen' in British Columbia are very high, exceeding 10 tons/acre in research plots. Future cultivars may not have higher yields than these cultivars, but may excel in other traits such as root rot resistance, cold hardiness, or fruit firmness.

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Blackberry Cultivars and Production Trends in the Pacific Northwest

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There are three types of blackberries (*Rubus spp.*) commercially grown in the United States: 1) erect, 2) semi-erect and 3) trailing. Erect and semi-erect types predominate in the eastern and southern regions of the United States. The Pacific Northwest (California, Oregon, and Washington, USA, and British Columbia, Canada) is the principal producing area for training blackberries. Hectarage of erect and semi-erect types in this region is still small, but will likely increase.

The following fruit researchers and extension workers were contacted in 1991 to compile information for specific production areas in the Pacific Northwest: Bill Peters (BCMAF, British

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