Bramble Varieties: Review and Future

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Raspberry varieties are classified as floricane (summer) or primocane (fall) bearing. (Primocane types are sometimes described as everbearing and can be managed in a double cropping system where the floricane crop is harvested as well.) Raspberries are naturally biennial with a perennial crown. Primocanes grow the first year, go dormant in fall, get chilled in winter, and fruit the following summer. The flowering canes that were primocanes in the previous year are now called floricanes, which then die after fruiting. New primocanes are growing as the floricanes fruit. Floricane varieties must be pruned in the spring to thin the fruiting canes and remove dead canes for better disease management and fruit size. There are red (*Rubus idaeus*), black (*Rubus occidentalis*), and purple (red x black hybrid) raspberry varieties suitable for production in northeastern states.

Primocane varieties fruit on the first year's growth in the fall of the year. Currently, primarily only red primocane varieties are available although the first primocane black raspberry was recently released. The strength of fruiting in primocane types varies widely from tips only on some floricane varieties to nearly the whole cane in varieties such as 'Autumn Bliss' and 'Polana'. Later primocane varieties such as 'Ruby' and 'Heritage' can have yield reductions from early frosts in more northern growing regions. Pruning primocane varieties is done by mowing spent canes to the ground in early spring before new primocanes emerge.

Currently available black and purple raspberry varieties are floricane bearing (except the new variety 'Explorer') with most developed in New York or derived from germplasm from the region. Black raspberries have the potential to be a highly profitable crop for growers in northeastern states in a diversified production system. However, establishment costs are high and budget projections indicate the breakeven point to come in the second production season, some 26 months after planting. Unfortunately, productivity in currently available varieties can begin to decline after two production seasons due to pest pressure. Typical yields in the region range from 1 to 3 tons per acre compared to 3 to 7 tons per acre for red raspberry, with fruit size generally less than 2.5 grams per berry. Thus, higher prices are needed for the black raspberry to be a viable crop for most growers. Purple raspberries have limited market potential at this time, mainly for u-pick operations for processing.

New raspberry varieties are actively being developed in about 11 public breeding programs around the world with the majority suitable for production in the northeastern U.S. coming from Cornell University ('Heritage', 'Encore', 'Prelude', 'Titan', 'Ruby', 'Taylor'), University of Maryland ('Caroline', 'Anne', 'Josephine', 'Jaclyn') and Ag Canada in Nova Scotia ('Nova', K81-6). Increasingly, new varieties from European programs are being introduced in to the U.S. ('Autumn Bliss', 'Autumn Britten', 'Polana', 'Himbo Top' and others). New varieties are released all the time, but the vast majority of them fail to catch on for various reasons including poor adaptability to diverse growing regions, unforeseen disease or insect susceptibility, or fruit characteristics that are unacceptable to the buying public. No variety will work well in all locations, soil types, and productions systems, but many have proven to useful in many different situations. This list is by no means complete but should address most situations. By planting a series of varieties, it is now possible to have fruit from mid to late June until fall

frost (or longer with protection) in much of the northeastern U.S. with only a short late-summer lag in production.

Obtaining high quality planting stock is an important step in developing a successful bramble planting; poor plant material guarantees a poor planting. Plants should be ordered from a reputable source, preferably a nursery that sells plants from "certified" virus-free stock. Certification is an assurance that the plants have been tested by indexing and found free of common viruses. Virus-free plants have the best growth and productivity and will generally live longer and be highly profitable. Field-grown nursery stock has a greater chance of being infected with disease such as crown gall, *Phytophthora*, *Verticillium* or viruses than tissue culture plugs or stock grown from tissue culture.

RED RASPBERRIES

Early Season

Boyne and **Killarney** (sibling varieties from Manitoba) perform very similarly. Both have are early season with small to medium sized fruit with good eating and freezing quality but can be somewhat dark and soft. The plants are spiny and produce many suckers. They have excellent winter hardiness but are susceptible to anthracnose. Boyne is moderately resistant to late yellow rust and tolerant to Phytophthora root rot and crown gall, but is susceptible to raspberry fireblight. Killarney is moderately resistant to Phytophthora root rot and is susceptible to mildew.

Prelude (Cornell University-NYSAES, Plant Patent #11,747) is the earliest summer fruiting variety available. The fruit is medium sized, round, and firm with good flavor. It is very resistant to Phytophthora root rot and has good cold hardiness. A moderate fall crop is large enough to warrant double cropping. It is the best early season variety available for the northeast.

Mid Season

Canby (Oregon) canes are tall, nearly spineless, and moderately productive. The fruit ripens mid season, is medium to large in size, firm, and bright red with excellent flavor. It has moderate to poor cold hardiness, and buds may winter kill in cold climates. It is susceptible to Phytophthora root rot.

Nova (Nova Scotia) is vigorous and upright with long, fruiting laterals. The canes have very few spines. The fruit ripens in mid-season and is medium sized, bright red, firm, and somewhat acidic in taste. It is considered to have better than average shelf life. The plants are very hardy and appear to resist most common cane diseases, including rust.

Titan (Cornell University-NYSAES, Plant patent # 5404) produces large canes with very few spines with suckers that emerge mostly from the crown, so it is slow to spread. It is susceptible to crown gall and Phytophthora root rot but is extremely productive. Fruits ripen mid to late season and are extremely large and dull red, with mild flavor. Berries are difficult to pick unless fully ripe. With only fair hardiness, Titan is for moderate climates. It is resistant to the raspberry aphid vector of mosaic virus complex.

Late Season

Encore (Cornell University-NYSAES, Plant patent # 11,746) is one of the latest summer fruiting raspberry varieties available. It produces large, firm, slightly conical berries with very good, sweet flavor. The fruit quality is considered very good. It is susceptible to Phytophthora root rot and may show winter damage with fluctuating spring temperatures.

K81-6 (Nova Scotia) produces canes that are medium tall with spines only at the base. The fruit is very large with good flavor that ripens very late summer with average firmness. It is resistant to late yellow rust but is susceptible to leaf curl virus and raspberry fire blight. Hardiness is judged adequate for most areas.

Fall Bearing

Autumn Bliss (Great Britain, Plant Patent #6597) is an early ripening raspberry with large, highly flavored fruit. It ripens 10 to 14 days before Heritage. Much of the crop is produced within the first two weeks of harvest, which is an advantage in northern climates. It produces short canes with few spines. The fruit is somewhat dark fruit. It is susceptible to raspberry bushy dwarf virus.

Autumn Britten (Great Britain, Patent Pending) is early ripening with large, firm, good flavored fruit. It is taller than Autumn Bliss with better fruit quality but slightly lower yields. It is a day or two later than Autumn Bliss.

Caroline (University of Maryland, Plant patent # 10,412) is a large, good flavored, conical fruit. It produces tall upright canes. The short fruiting laterals can be challenging to pick, but yields are very good for the fall. It has moderate to good resistance to Phytophthora root rot.

Dinkum (Australia, Plant patent # 9477) is produces early, good flavored, firm fruit. Shelf life can be extended with early picking. Canes are spineless, stout and strongly erect. It is moderately resistant to late yellow rust and susceptible to Phytophthora root rot and raspberry bushy dwarf virus.

Heritage (Cornell University-NYSAES) is considered the standard for fall bearing varieties. These tall, rugged canes have prominent thorns and are very high yielding. The primocane crop ripens relatively late. Fruit is medium-sized and has good color and flavor, firmness, and good freezing quality. It is resistant to most diseases. Due to its late ripening, this variety is not recommended for regions with cool summers or a short growing season with frost before September 30.

Jaclyn (University of Maryland, Plant Patent #15647) is an early season variety with large firm berries ripening 2 weeks before Heritage. Plants are vigorous and erect but susceptible to yellow leaf rust. Fruit is dark red and adheres tightly until fully ripe.

Ruby (Cornell University-NYSAES, Plant patent # 7067) is moderately vigorous with good productivity. The primocane crop ripens slightly ahead of Heritage. The fruit is large with a mild flavor. Ruby is susceptible to Phytophthora root rot. The variety is suggested for fresh market or shipping in areas with longer growing seasons. It is susceptible to mosaic virus complex and resistant to late yellow rust and powdery mildew.

Greenhouse Production

Tulameen (British Columbia) has been shown to be superior for greenhouse production. It produces very large fruit, and high yields. The fruit is glossy and firm. It is resistant to aphid vector of mosaic virus complex. Plants are not adequately hardy for field production in the Northeast.

YELLOW RASPERRIES

Anne (University of Maryland, Plant patent # 10,411) produces large, conic, pale yellow fruit that ripen mid- to late season. It has very good flavor and texture. Tall upright canes sucker sparsely requiring higher planting density. It is resistant to Phytophthora root rot but susceptible to leaf hoppers and rust.

Fallgold (University of New Hampshire) fruit is medium-sized, yellow with a pink blush, and soft, but has excellent flavor. It is poor for freezing or processing. Canes are very vigorous and produce many suckers. The primocane crop ripens relatively early.

Golden Harvest (New York) produces a firm yellow berry with good flavor. The fruit is small and yield potential is moderate. It fruits in the late autumn season similar to Heritage and has good plant vigor.

Kiwigold (New Zealand, Plant patent # 11,313) and **Goldie** (cv. Graton Gold) (California, Plant Patent #7,625) are amber sports of Heritage, similar in all characteristics except fruit color. Fruit blushes pink when overripe with Goldie slightly darker. The fruit is medium-sized and has good flavor and firmness and ripens relatively late. They are resistant to most diseases.

BLACK RASPBERRIES

Allen (Cornell University-NYSAES) produces medium sized fruit that ripens relatively early with an attractive shiny black color with good quality. The plants are vigorous and moderately hardy.

Black Hawk (Iowa State University) fruit ripens early and is small and glossy with good firmness. The plants are vigorous, relatively hardy, and resistant to anthracnose but highly susceptible to *Verticillium* wilt.

Bristol (Cornell University-NYSAES) fruit ripens relatively early and is medium sized and firm, with excellent flavor. Plants are vigorous, high yielding and hardy. It is susceptible to anthracnose and tolerant to powdery mildew.

Haut (USDA-ARS, Maryland) produces medium sized, firm fruit that ripens over a long period. The fruit is dark black, glossy and very attractive but soft. The plants are vigorous with good productivity.

Huron **(Cornell University-NYSAES) produces medium to large sized fruit that is firm and glossy. Canes are vigorous moderately hardy and moderately resistant to anthracnose.**

Jewel (Cornell University-NYSAES) fruit is the largest of the black raspberries and is firm, glossy, and flavorful. Plants are vigorous, erect, hardy, and productive. This cultivar appears to be more disease resistant than others including resistance to anthracnose. Sunscald can be a problem in hot seasons.

Mac Black (Michigan) produces medium large berries that ripen 7-10 days later than most cultivars. The fruit is moderately firm and of good quality. The canes are vigorous, erect, and hardy.

Munger (Ohio) produces shiny black fruit that is medium sized with good firmness and flavor. The canes are sprawling and moderately vigorous but with poor cold hardiness.

New Logan (Illinois) fruit ripens relatively early so and is mediums sized with good quality. It is very productive. It is resistant to leaf curl virus but susceptible to anthracnose.

PURPLE RASPBERRIES

Brandywine (Cornell University-NYSAES) ripens later than most red varieties and is large, reddish-purple, and quite tart. Berries are best used for processing. This is a high yielding variety. Canes are very tall with prominent thorns, and suckers grow only from the crown so the plant will not spread. It is susceptible to crown gall but partially resistant to many other diseases.

Estate (Minnesota) is more red than purple, large, and round with good flavor. It ripens very late. Plants are tall and thorny. Suckers emerge from the crown, so plants are slow to spread. It has acceptable winter hardiness.

Royalty (Cornell University-NYSAES, Plant patent # 5405) is the most widely planted purple variety. Fruit ripen late and are large and reddish-purple to dull purple when fully ripe. Berries tend to be soft but sweet and flavorful when eaten fresh. It is excellent for processing and can be harvested when fruit is red for fresh eating. Canes are tall and vigorous, with thorns, and are extremely productive. Royalty is immune to the large raspberry aphid, which decreases the probability of mosaic virus infection, but is susceptible to crown gall.

On The Horizon

There are many new named varieties that are being tested but are not yet available yet from most commercial nurseries. Summer varieties include ‘Emily’, ‘Esta’ and ‘Claudia’ from Maryland and ‘Moutere’ from New Zealand. Fall bearers include ‘Josephine’ from Maryland, the early season ‘Polka’ from Poland, and ‘Himbo Top’ from Switzerland. Many varieties are available from the west coast programs but have not been tested widely in the east. Most of these have insufficient cold hardiness for much of the east but may work in more southern sections. As

always, experiment with new varieties on a small scale first to judge suitability in individual situations.

Claudia (University of Maryland, Patent pending) fruit is large and conical with moderate firmness and good flavor, and ripens mid to late season. A late fall crop is common. Produces stout, upright canes but suckers sparingly. It has acceptable cold hardiness for most areas.

Emily (University of Maryland, Plant Patent #12,350) has large mid-season fruit with good yield potential. Firm fruit is large with a narrow cavity and mild flavor. It is susceptible to Phytophthora root rot. It has a low chilling requirement and susceptible to fluctuating spring temperatures and is only moderately cold hardy.

Esta (University of Maryland, Patent pending) has large conical fruit with a sweet, intense flavor ripen in the early season. Fruit can become soft in hot weather. Needs trellising for ease of picking. Has poor cold hardiness but tolerant to fluctuating spring temperatures. It is resistant to leaf hoppers but susceptible to Phytophthora root rot.

Himbo Top (Switzerland) produces good quality, large fruit on primocanes. The fruit is bright red with good flavor. Plants are vigorous and upright and medium in height that will benefit from trellising. It is a light sucker producer so higher planting densities may be needed.

Josephine (University of Maryland, Plant Patent #12,173) fruit is large with average flavor ripening mid-season. Berries are firm and cohesive. Plants are upright and vigorous needing little containment trellising. It is resistant to leaf hopper and Phytophthora root rot.

Moutere (New Zealand) is an early mid-season floricane fruiting (summer) type. Fruit is medium to large with medium red color and good shelf life. Plants are vigorous and upright with moderate hardiness. It is resistant to raspberry bushy dwarf virus (RBDV).

Polka (Poland) has medium large primocane fruit that ripen in the early season. Widely grown in Europe, it is reported to have good fruit quality and good yields.