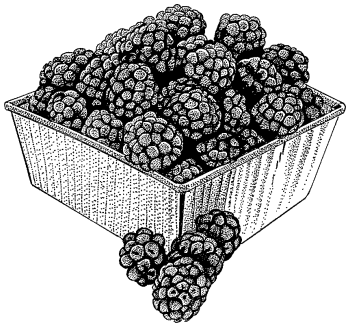

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RASPBERRY PRODUCTION SUMMARY – 2007

Raspberry Varieties

The following are the varieties recommended for New York State. Standard, tried and true varieties are underlined. Other varieties are either older varieties that may not perform as well under New York conditions, or they are new (*****)varieties that look promising but we don't have years of experience on which to base a solid recommendation. Try them at your discretion.

Table 1. Recommended raspberry varieties.

Early Season	**Mid-Season**	**Late Season**	**Fall Bearing**	**Black**	**Purple**	**Greenhouse Production**
Boyne	Canby	Encore	Anne[y]	Bristol	Brandywine	Tulameen
Killarney	Claudia	K81-6	Autumn Bliss	Jewel	Royalty	
Prelude	Emily	Caroline	Autumn Britten	Mac Black		
Jaclyn	Nova		Goldie[y]			
	Titan		Kiwigold[y]			
			Heritage			
			Himbo Top			
			Josephine			
			Ruby			

("Y" = refers to yellow fruited varieties. A detailed description of varieties found at the end of the production summary)

Preplant and Planting Year Considerations

Raspberries can be a profitable crop if managed correctly. They are very perishable and consideration should be given to marketing before you even begin. If you plan on U-Pick, consider where you will be drawing customers from and who else grows raspberries in your area. If you plan to retail or wholesale, you will need some type of a cooler. Non-refrigerated raspberries will only last one day. There's some potential to sell raspberries frozen to small scale processors and wineries. If you plan to mechanically harvest, you will need more than a few acres. Mechanical harvestors are very expensive, so custom harvesting may be an attractive option. Special marketing considerations are needed if you're going to plant yellow raspberries. Also, along with summer tasks in raspberry production, you need to consider allotting time for winter pruning . Before you begin, there is a lot to think about!

1. Soil preparation: Soil comprehension is extremely important in bramble production since 90% of the root system is in the top 20" of soil. Raspberries need a well drained, loamy soil with a pH of 5.5 - 6.5. During the pre-plant year, get a soil test and apply P and K and lime according to the test results. Planting a cover crop during this year will increase organic matter, soil tilth and soil nitrogen. There are many options. See the table in the first few pages of Cornell Pest Management Guidelines for seedling dates and rates. Marigolds and sudangrass will suppress nematode levels and crowd out weeds. The preplant year is also the time to clean up weed problems. Quackgrass

and other perennials need to be controlled before planting. Fall Roundup applications at 2-3 quarts acre is the most effective material. Its easier to control weeds before planting than when raspberries are once established. Raised beds will reduce the risk of soil diseases.

2. Planting: If bare root plants are used, they can be planted as soon as the soil can be worked in the spring. Green plugs should be planted like vegetable transplants - when the danger of frost is past. Be cautious, they are very sensitive to herbicides. The best way to establish tissue cultured plants is to cover the soil within the row with a layer of straw mulch during the planting year. This not only provides weed control, it also results in better cane growth, higher yield and earlier yield the next year. However, be conscious of mice damage by seeking shelter. Irrigation is essential, but remove the mulch once weather cools in October. Brambles require full sunlight and air movement, plus protection from frost injury.

Plant spacing can be 3' to 4' within rows and 8' to 12' between rows. Some growers plant closer in row (24”) to cut down on weed competition and increase the establishment rate. Many narrow rows are better than fewer thick rows. Remember, you are "farming sunlight". If planting in heavy soils, be sure to plant on raised beds.

3. Planting year weed control: For the first 6 to 8 weeks, use mulch over herbicides on tissue cultured plants. On bare root plants, Devrinol can be used later in the season and/or a low rate of simazine can be used after 6 months. Poast can be used as a post-emergent grass herbicide. Be sure to add the correct rate of oil concentrate or Poast will not work satisfactory.

4. Planting year fertilizers: Fertilize raspberries very lightly in the planting year. Apply 25-35 lbs of actual nitrogen per acre about 4 weeks after planting. Calcium nitrate is the best source of avaialble nitrogen to use; 200 lbs/acre of calcium nitrate supplies 30 lbs. of actual nitrogen. For fall bearing varieties, apply another shot in August.

5. Variety selection. Above are some favorites for New York State. Standard, tried and true varieties are underlined. A more detailed descrition on raspberry varieties can be found at the end of this production summary.

Established plantings – Spring Chores

1. Pruning should be completed by early spring.

For summer bearing varieties, remove all of last year's spent floricanes (the canes that fruited last year) at ground level. Remove any damaged or diseased canes, and thin out the remaining primocanes (the ones that will be fruiting this year) to 3 - 4 healthy canes per square foot. Canes can be tipped to a convenient height for picking. This pruning system ensures consistent yields from year to year. It is the simplest way to manage raspberries. For other methods (like alternate year mowing, or primocane suppression, see the Bramble Production Guide - ordering information at the end of this calendar).

For fall bearing varieties, simply mow down all the canes at ground level using a sickle bar mower or bush hog. Be sure not to mow too closely. There should be several inches of cane to avoid crown injury and enable a bud to shoot. Unlike summer bearers, for fall bearing raspberries, you want the maximum number of canes per square foot. All pruning should be done during dormancy (usually January - March).

For both summer and fall bearing raspberries, narrow up the rows to 12" to 15" with a mower in early summer. It is far better to have many narrow rows than it is to have a few thick rows. Thin rows allow light penetration and air movement which is important for disease control.

2. Spring Fertilizers: A general rate to use is 50 lbs of actual nitrogen/acre on one year old plants, 75 lbs of actual nitrogen/acre on two year old or older plants. Use more on light soils or on irrigated soils. For economical purposes, use whatever source of nitrogen is cheapest. Complete fertilizers like 15-15-15 need not be used except on sandy soils. For example, if you used ammonium nitrate you would need 150 lbs/acre to supply 50 lbs of actual nitrogen, or 225 lbs/acre to supply 75 lbs of actual nitrogen (since ammonium nitrate is only 34% N). Apply all the fertilizer at bud break in the spring, or split the application between bud break and June.

Fertilizer exceptions: Nonirrigated plantings should get slightly less actual nitrogen than irrigated ones; young plantings should get about half of what mature ones get; and, fall bearing varieties should get less than summer bearing ones, since excess nitrogen seems to delay fruiting, and this fruit is lost to fall frosts.

3. *Phytophthora* root rot: *Phytophthora* root rot is a disease that often occurs on wet sites when highly susceptible varieties like Titan, Lauren, Festival, Ruby, Taylor and Reveille are planted. Management of this disease requires an integrated approach. Start with less suceptible varieties (Table 1.) and good soil drainage. Most importantly, plant on raised beds, do not straw mulch susceptible varieties in the planting year, and use fungicides if necessary.

Symptoms of this disease are weak, stunted canes, with small yellow leaves that may be scorched on the edges. The roots appear to be dead when dug up. If this disease has been spotted in the past, early spring applications of Ridomil Gold EC or Phosphite biopesticides (Alliette & Phostrol) are recommended. Repeat the applications in early fall. While RidomilGold is a root drench, Phosphite biopesticides are foliarly applied. The first foliar application goes on after approximately 3" of new growth appear in the spring, and is repeated every 45-60 days if the soil stays wet, but not within 60 days of harvest. See 2007 Cornell Pest Management Guidelines for Berry Crops for additional details.

Table 1. Susceptibility of Raspberry varieties to *Phytophthora* root rot.

Highly Suceptible	Less Susceptible
Titan	black raspberry varieties
Lauren	Brandywine
Festival	Royalty
Ruby	Boyne
Taylor	Encore
Reveille	Prelude
	Killarney
	Autumn Bliss

4. Apply preemergent herbicides, if none were applied in the fall. (see "fall herbicides" section for details).

5. Get irrigation and trellises in place: Raspberries grown in the Northeast benefit from trickle irrigation, especially on sandy soils. Plan on applying 1" to 2" of water/week. Avoid overhead irrigation since it favors disease development.

Trellises greatly increase productivity of raspberries and, they aid in disease control by allowing air and light into the canopy. Summer bearing varieties do best with a V-type trellis that pulls the fruiting canes to the outside and lets the new primocanes grow up in the center.

Fall bearing varieties do fine with removable, rebar "T"s set into the row every 25 feet or so. Baling twine can be used to hold the plants in place.

6. Cane disease control: Spur blight, anthracnose and **cane blight** are the major fungal diseases that cause lesions on the cane. To reduce overwinter inoculum, apply a delayed dormant spray of lime sulfur or copper at bud break (just as the buds show ¼" to ½" of green at tips). This application is essential, especially on black raspberries. Sprays applied after ½ inch green tip can burn the leaves especially in warm weather. Thorough coverage of the canes is a must.

Applications are not necessary for fall bearing varieties, since overwintering canes are pruned out completely. Cultural control is properly spacing your canes to allow wind and sunlight penetration.

Newly labeled fungicides for bramble production against cane diseases: Abound 2.08F, Cabrio EG, and Pristine are strobilurin fungicides labeled for control of spur blight and anthracnose of brambles. These fungicides have several use restrictions due to resistance concerns (see labels). If there are apples nearby, avoid Abound all together. Even tank residues of Abound will cause severe phytotoxicity in "McIntosh" apples. See 2007 Cornell Pest

Management Guidelines for Berry Crops for additional details.

7. Crown borers may also need attention this time of year (prebloom), although the fall is also an appropriate time. Symptoms of crown borer damage often look like root rot, wilt at once. This wilting is caused by larvae tunneling around in the crowns.

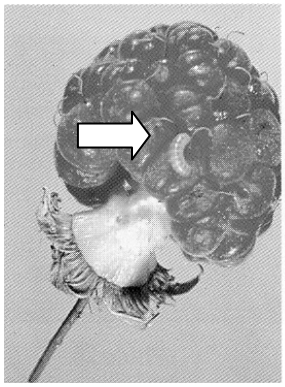
Raspberry crown borer
Adult female of the raspberry crown borer
(Pennisetia marginate)
Source: R. N. Williams

This pest has a two year life cycle. The adult, which looks like a yellow jacket, is actually present during August and September. The female lays its large, oblong-sahped eggs under the leaves of weeds and raspberryAfter hatching, the larvae seek out a place to spend the winter at the base of canes. The following spring, they move further into the wood, eventualling tunneling into the crown where they can cause extensive damage. They form a pupa in the early to mid-summer of their second year and then emerge as adults in the late summer or fall. Hence, the oportune timing for chemical control is either in the fall or early spring when the larvae are more exposed. Bifnthrin is labeled for crown borer on raspberry. In addition to chemical control, problems with crown borer can be reduced culturally by removing dying canes, including the crown, during the growing season., See the 2007 Pest Management Guidelines for Berry Crops for rates and formulations.

Cane borers tend to burrow into the canes of brambles. An entry in the middle of a cane bordered by two distinct lines is evidence of cane borers. Generally, the point of entry determines the difference between a cane borer and crown borer. Characteristically, swelling at the base of a cane or tip wilt and dieback indicates a borer infestation.

As a preventive measure, any canes with swellings at the base should be removed and destroyed during the dormant season. No products are labeled for cane borer control in raspberries. Be sure to carefully monitor bramble plantings for the evidence of borers.

8. Fruitworm and sawfly control: Adult fruitworms (a light brown beetle) emerge during late April to early May and skeletonizing leaves, Later in the season the larvae are found between the fruit and the white receptacle when the fruit is picked. Raspberry sawfly adults also appear in the spring. The larvae cause leaf feeding damage that is similar to the adult feeding damage of fruitworms. Control of adult fruitworms and larval sawflies should be done with an early pre-bloom spray. Sevin is your only control option at this stage. Pyrethrin is an additional chemical control option late pre-bloom. See berry guidelines for deatils. Fall fruiting varieties usually escape these pests.



Eastern Raspberry Fruitworm
larva on Raspberry

9. Post-emergent grass control: Fusilade plus a 1% crop oil concentrate will provide adequate control on actively growing grasses that are less than 8 inches tall. However, it is not registered on actively growing raspberry plantings. In established plants, Poast is a post emergent grass herbicide that can be used in the spring. Poast also has to be applied when grasses are in a particular growth window. Poast can suppress quackgrass up to 6" tall. Don't use more than 2.5 pts/acre total of Poast per season.

Summer Chores

1. Late pre-bloom insect control: Cane borers, Tarnished Plant Bug and **Japanese Beetle** are insects that may need an insecticide spray this time of year. The cane borer beetle is a slender, 1/2" long, black bug with a bright orange band and long black antennae. The adults appear in May and early June. Before laying an egg, the female punctures the canes, creating two rings about ½" apart and 6" from the cane tip. Damage will appear as a wilted cane tip, which often breaks off. Removal of damaged tips during the growing season can help reduce borer populations. Clip tips several inches below affected portion. During the growing season the larvae burrows down from this area towards the base of the cane, which may swell as the insect pupates. There are no labeled pesticides for cane borers so scouting for wilted canes is very important. Also, canes with swellings should be removed and burned during the dormant season. These insects fly at night and its questionnable whether spraying would be a practical control.

Tarnished Plant Bug adults overwinter and are active from late April until mid-May. They lay their eggs on almost all flowers, including fruit crops, weeds, and neighboring alfalfa fields. The adults and nymphs feed on blossoms and developing fruit causing misshapen, small, crumbly berries and lower yields. The first generation of adults appear in mid-June in our area. To To scout for TPB nymphs, simply place a white paper plate under the flower and fruit clusters and gently smack the plant. TPB will fall onto the plate where they are easy to identify and count.If 10-20% of clusters are infested with nymphs, you might want to consider an insecticide application.

Japanese Beetles are one of the most annoying pests to pickers. Just about everyone knows what these beetles look like. Sevin is the most effective material against Japanese beetles; it is not labelled for use on cane borers, but is for TPB. You can also try malathion, or pyrethrin for control of these noxious pests. Don't try to trap with Japanese Beetle traps, more beetles may be drawn in.

2. Early bloom through harvest disease control: Gray mold (*Botrytis* fruit rot) is a fungal disease of strawberries endemic to New York. The fungus overwinters in leaf litter and newly-fored spores infect the senescent flower parts. When the fruit ripens, the fungus, quiescent in unripe berries, sporulates and covers the fruit with a fuzzy gray spore mass. By this time, there's no point in applying fungicides. Red raspberries are generally more susceptible than black raspberries.

Gray mold managment requires an integrated approach including: (1) cultural practices that promote good air circulation in the canopy; (2) keeping the fruit picked regularly, including the diseased fruit to reduce the inoculum levels; and, (3) fungicide applications before wet weather at bloom. Several fungicides are labeled for Gray mold control. See 2007 Cornell Pest Management Guidelines for fungicide options.

Newly Labeled fungicides:
Elevate 50 WDG fungicide is registered for use on Gray mold of caneberries (red and black raspberries, blackberries, and loganberries) and bushberries (blueberries, gooseberries, currants and huckleberries). It does not have activity against any other diseases. See the label and the 2007 Cornell Pest Management Guidelines for additional use requirements.

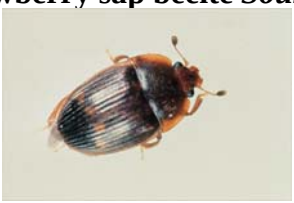
Cabrio EG, and **Pristine** are now labeled for raspberry Gray mold managment. See the labels and the 2007 Cornell Pest Management Guidelines for additional use requirements.

3. Insect control: Sap Beetle, Tarnished Plant Bug, and Spider Mites are the pests to watch for. Sap beetles (or picnic beetles) are 1/4" long, black beetles with 4 orange-red spots on their backs. Adults emerge from organic matter on the ground after temperatures exceed 60F to 65F for several days. They feed, mate and lay eggs. New adults appear starting in July. If these adults are observed, Malathion or Pyrethrin can be used. Malathion can be applied up until one day before harvest. This will help control TPB. If sap beetles are the main problem, you might try trapping them. Some growers have good luck using milk jugs with beer or fermenting fruit in them.

Two-spotted spider mites can cause foliar injury to raspberries. Look for white stippling on leaves and the tiny spider-like mites on the underside of leaves. Savey has recently been registered for control of spider mites on caneberries. Apply early in the infestation (2-3 mites per leaf) for best results. Savey is not hard on beneficial mites.

Picnic beelte *Source:APS Press*

Strawberry sap beelte *Source: APSPress*



Postharvest Chores

1. Cultural practices: Take leaf samples between August 1st and 20th to fine-tune your fertilizer program. Exact price for leaf analyses will not be available until after July 1st. Call Karen for more informaiton at 315-963-7286, ext. 201.

2. **Phytophthora root rot control**: On high-risk plantings, a second application of Ridomil Gold ECor Phosphite biopesticides (Alliette & Phostrol) in the fall may be beneficial. Ridomil Gold EC is applied as a root drench to the soil in a 3 foot wide band over the row. Phosphite biopesticides are applied to the foliage . The last time to apply Phosphite biopesticides is 30 days before leaf drop.

3. Fall weed control: During the planting year, the best preemergent herbicide to apply in the fall is Devrinol. It should be incorporated within 24 hours of application. In later years, there are more options. A mixture of 2.5 lbs/acre of Princep (simazine) plus either (a) 5 lbs/acre Surflan, (b) 8 lbs/acre Devrinol or (c) 2 lbs/acre Sinbar works well. Solicam is a potential fourth option to mix with the simazine, but it is expensive, injury is possible, and it should not be used on plants under 1 year old.

The simazine/Surflan mixture works best if it is split in half between spring and fall. Surflan should not be used on soils with high organic matter contents. Sinbar should not be used on plants less than 1 year old. Sinbar is very hot on raspberries, especially the variety Canby. Purple raspberry varieties like Royalty are sensitive to all herbicides.

Casoron (by itself) is another option. Apply 100 lbs/acre (1.8 lbs/100 ft of row) of this granular between late fall and early spring when the soil isn't frozen and temperature is less than 40ºF.

4. **Apply non-nitrogenous fertilizers and lime:** P, K, Mg, and other fertilizers should go on in the fall so that winter snow can wash them in. Use your leaf analysis results to fine tune your fertilizer program. Test soil pH and adjust with lime, if necessary.

Azinphos-methyl (Guthion): EPA has **cancelled** its use on caneberries, cranberries, peaches and nectarines, following the registrants' request. Growers with current labeled product can use azinphos-methyl only through next year's growing season.

In A Nutshell

April: 1. Complete pruning
2. Apply nitrogenous fertilizers
3. Apply Ridomil for Phytophthora root rot, if necessary
4. Apply preemergent herbicides

May : 5. Get irrigation and trellises in place
6. Apply lime sulfur for cane diseases

May : 7. Apply Sevin for fruitworm and sawfly control if necessary
8. Apply post emergent grass herbicides, if necessary

June: 9. Apply Sevin against tarnished plant bug and Japanese beetle, if necessary. Remove canes tips with cane borer damage.

July : 10. Keep gray mold under control. Use Rovral, if necessary, during bloom, keep rotten fruit picked during harvest.

11. Use traps, Malathion, or Pyrethrin to keep sap beetles under control.

August 12. Prune out spent floricanes,

13. Take leaf analysis samples.

Oct/Nov 14. Apply RidomilGold for Phytophthora root rot, if necessary

15. Apply fall herbicides

16. Apply non-nitrogenous fertilizers like P, K, Mg B. Also lime, if needed.

This production summary is intended to be a brief overview of the steps involved in growing raspberries using the simplest and most economically conservative methods. Information on production systems, organic production methods, etc. can be found in detail in NRAES-35 "Bramble Production Guide". Furthermore, to apply pesticides, you should consult the legal recommendations for your state as labels vary by state. In New York, the official source is the 2006 Pest Management Guidelines for Berry Crops ($18).

Educational Resources for Bramble Growers – Print Publications

1. *Raspberry and Blackberry Production Guide for the Northeast, Midwest and Eastern Canada.* NRAES-35. $45. Available from our office (315) 963-7286. This is a comprehensive guide to raspberry and blackberry growing, containing information on all aspects of production, budgeting and marketing. The guide contains 100 photos detailing insect and disease symptoms, nutrient deficiencies, herbicide injury symptoms and much more. This is a must for the serious brambley grower. *Note from CCE Oswego County: The cost of the Raspberry and Blackberry Production Guide (NRAES-88) is $45 plus $5 postage. Contact NRAES (The Northeast Regional Agricultural Engineering Service) at (607) 255-7654 to place an order.*

2. *Cornell Pest Management Guidelines for Berry Crops* available from your extension office for around $18.

3. *Compendium of Raspberry and Blackberry Diseases and Insects* published by the American Phytopathological Society in St. Paul, MN. Approximate cost is $37. Call 1-800-328-7560 for ordering details.

4. *Midwest Small Fruit" Bulletin 861* Published by Ohio State University Extension. For purchasing information contact Media Distribution Columbus, OH 614-292-1607.

Educational Resources for Bramble Growers- Grower organizations

1. *New York State Berry Growers Association*. Be sure to join this important political voice. Contact Jim Altemus at (716) 657-5328 or goodberries@frontiernet.comfor more information. Visit their website at: http://www.hort.cornell.edu/grower/nybga/index.html .

2. *North American Bramble Growers Association (NABGA)* Your national Bramble Grower Organization. For more information contact Debby Wechsler, Executive Secretary, 1138 Rock Rest Rd., Pittsboro, NC 27312 E-mail: nabga@ mindspring.com or Phone: 919-542-3687, Fax: 919-542-4037. Visit their website at: http://www.raspberryblackberry.com/.

Educational Resources for Bramble Growers- Web-based Information

1. *Cornell Fruit Resources Page – Berry Section* - http://www.fruit.cornell.edu/berry.html. These pages include production and pest management information on the major small fruits including strawberry, blueberry, blackberry and raspberry, currants and gooseberries. Other specialty small fruit information is also provided. Also included are links to small fruit information from other Cornell and Non-Cornell sources. Pages featuring post harvest handling and marketing are also available.

2. *Cornell Pest Management Guidelines for Berry Crops* - http://ipmguidelines.org/BerryCrops/ . This is an on-line version of the print publication.

3. *Cornell Berry Diagnostic Tool* - http://www.hort.cornell.edu/department/faculty/pritts/BerryDoc/Berrydoc.htm .Dr. Marvin Pritts has done an excellent job developing a web-based diagnostic tool to help the grower/educator determine what might be wrong with their berry plants — from pest injury to herbicide injury to nutritional deficiencies. By answering a series of questions about symptomology, one is led to a possible cause. The site uses lots of photographs, so it can be a little slow with a modem.

4. *Cornell Small Fruit Nursery Guide* - http://www.fruit.cornell.edu/Berries/nurseries/index.html To find a source for a particular cultivar, go to the site, select a crop, find the cultivar of interest, note the nursery links, then click on those links for address, phone number, email addresse, web sites and FAX numbers, etc. for a particular nursery. This guide is updated annually.

5. *New York Berry News* http://www.nysaes.cornell.edu/pp/extension/tfabp/newslett.shtml. *This is* s a monthly on line small fruit newsletter which covers all aspects of berry production. Available also in low resolution format for easy of downloading.

Raspberry Varieties

Early Season

Boyne and **Killarney** (sibling varieties from Manitoba). These two varieties perform very similarly. Both 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 fire blight. 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 cultivar 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 cultivar 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. It will set a late fall crop.

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 raspberries available. It produces large, firm, slightly conical berries with very good, sweet flavor. The fruit quality is considered very good. It is moderately susceptible to Phytophthora root rot and has good cold hardiness.

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

Anne (University of Maryland, Plant patent #10,411) produces large, conic, pale yellow fruit with very good flavor and texture in mid to late season. It produces tall upright canes but does not sucker adequately for good stands. It is resistant to Phytophthora root rot.

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.

Kiwigold (New Zealand, Plant Patent #11,313) is an amber sport of Heritage, similar in all characteristics except fruit color. Fruit blushes pink when fully ripe.

Heritage (Cornell University – NYSAES) is considered the standard for fall bearing cultivars. 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 cultivar is not recommended for regions with cool summers or a short growing season with frost before September 30.

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. Reported to be resistant to Phytophthora root rot.

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.

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.

Polana (Poland, Patent Pending) is a very early season cultivar that ripens 2 weeks before Heritage. It produces short productive canes with multiple laterals per node. The fruit is medium sized fruit with good flavor. Susceptible to verticillium wilt and Phytophthora root rot. It needs extra nitrogen to perform well.

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 cultivar 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.

On the Horizon

There are many new named varieties that are being tested but are not available yet from most commercial nurseries. Summer varieties include ‘Emily’, ‘Esta’ and ‘Claudia’ from Maryland and ‘Moutere’ from New Zealand. Fall

bearers include ‘Josephine’ and Alice (yellow) 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 northeast but may work in certain situations. As always, experiment with new varieties on a small scale first to judge suitability in individual situations.

Bramble Chores Throughout the Year

This checklist was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed by Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system. ***Brought to You Courtesy of The North American Bramble Growers Association (NABGA)***

Winter Bramble Chores

Plant growth and development

- ❑ Plant is “dormant” and accumulating chilling hours.
- ❑ Some differentiation may be occurring in the flower buds.

Pruning and trellising

- ❑ Pruning should occur in late winter or early spring. Ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in areas where ice storms are common, pruning can take place early winter to help avoid severe damage. Wait until early spring to prune floricane raspberries so winter injured wood can be removed.
- ❑ Make trellis repairs after plants have defoliated but before pruning and training.

Erect blackberry types

- ❑ prune out the spent floricanes
- ❑ Tie canes to wires in a fan shape
- ❑ cut lateral branches back to 8-12”
- ❑ thin canes to 6-8 canes/ hill (4 ft spacing)

Trailing blackberry types

- ❑ prune out spent floricanes
- ❑ tie or weave canes to wire so that they do not overlap
- ❑ prune side laterals to 12-18”
- ❑ thin canes to 6-8 hill (6-8ft spacing)

Primocane fruiting raspberries

- ❑ Prune (mow) primocane fruiting types to the ground

Floricane-fruiting raspberries

- ❑ prune out the spent floricanes
- ❑ tie canes to wires so they are spread out
- ❑ cut any lateral branches back to 6”
- ❑ thin canes to 6–8 / hill (3 ft spacing) or 3-4 canes per linear ft. of row

Weed control

- ❑ Many summer weed problems can best be managed in the fall and winter using preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension agent for cultural or chemical means to control these weeds.
- ❑ Establishing new blackberry or black raspberry plants into rows of black plastic or landscape cloth can reduce weed problems significantly. For red raspberries, straw mulch works best since new canes will emerge within the row, and must be able to push through the mulch.

Insect and disease scouting

- ❑ Scout fields for insect and disease damage and remove those canes.
- ❑ If possible, remove any wild brambles by the roots that are within 600 ft of your planting during the winter, or treat them with Roundup in autumn.
- ❑ Apply liquid lime sulfur to dormant canes, just prior to bud break, for disease control.

Planting

- ❑ Growers in warmer areas can plant in December. In northern areas, set dormant plants in spring when the soil thaws.
- ❑ Take soil tests to determine fertility needs one year before planting. Amend the soil in the fall prior to spring planting.

- ❑ Prepare list of cultivars for next year's new plantings. A commercial small fruit nursery list can be found at at www.smallfruit.org or www.hort.cornell.edu/nursery.

Water management

- ❑ Make repairs to irrigation system (check pumps, lines, etc).
- ❑ Plants generally do not need supplemental water in winter.

Marketing and miscellaneous

- ❑ Order containers for next season.
- ❑ Make contacts for selling fruit next season.
- ❑ Attend grower meetings.

Spring Bramble Chores

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed by Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system.

Plant growth and development

- ❑ Plants deacclimate quickly
- ❑ Bud differentiation (additional flowers formed)
- ❑ Bud break
- ❑ Flowering
- ❑ Primocane emergence

Pruning and trellising

- ❑ Finish pruning and make sure all floricanes are tied to the trellis before budbreak.
- ❑ Rotate shift trellises to horizontal position before budbreak; rotate to upright position immediately after flowering.

Weeds

- ❑ Weed growth can be very vigorous at the same time as the bramble crop peaks. Don't let weeds get out of control.
- ❑ Weed control is best done earlier in the season before harvest commences.
- ❑ Hand-weed perennial weeds in and around plots.

Insect and disease scouting

The period of time in the spring when the plant is flowering is the most important season for control of insects and diseases. Know what your pests are and how to control them.

Water management

- ❑ Bramble plants need about 1"-2" water/week. This amount will be especially critical during harvest.
- ❑ In the South consider installing an overhead system for evaporative cooling. Turn on once or twice a day from 10 am to 3 pm for short periods of time (approx. 15 minutes) until mid afternoon.

Nutrient management

- ❑ Apply second half of nutrients if doing split application.

Marketing and miscellaneous

- ❑ Service and clean coolers.
- ❑ Make sure you have enough containers for fruit in the coming season.
- ❑ Prepare advertising and signage for your stand.
- ❑ Contact buyers to finalize orders.
- ❑ Hire pickers.
- ❑ Prepare signage for field orientation; it is easier to tell pickers where to go if rows are numbered.

Summer Bramble Chores

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed and revised with the assistance of Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system.

Plant growth and development

- ❑ Fruit development.
- ❑ Rapid primocane growth.
- ❑ Floricanes senesce.

Pruning and Trellising

Floricane-fruiting raspberries:

- ❑ May need to adjust primocane numbers if canes are too thick (i.e. remove less vigorous primocanes at their base)
- ❑ Train primocanes to the trellis.
- ❑ Pinch black raspberry primocanes at 2 to 3 ft. to promote lateral growth.

Primocane-fruiting raspberries:

- ❑ Train primocanes within a trellis to hold canes erect.

Erect blackberry types:

- ❑ In warm climates with a long growing season, hedge (tip) the new primocanes when they are about 6-12" below the top wire of the trellis to encourage lateral branching. Continue hedging at monthly intervals to maintain desired branching and height of canopy (laterals should reach top wire).
- ❑ In colder climates, tip primocanes once when they are about 2 – 3 ft. tall to encourage lateral branching.
- ❑ Prune out spent floricanes after they have produced fruit, do not thin out primocanes until mid-to late winter.
- ❑ Train primocanes to trellis to minimize interference with harvest. Shift trellises or V trellises make this relatively easy.

Trailing blackberry types:

- ❑ Train new primocanes to middle of trellis, or on the ground in a weed free area or temporarily to trellis outside of fruiting area (depends on trellis type).
- ❑ Cut back side shoots to 18" (after dormancy in cold climates).
- ❑ Remove spent floricanes after harvest.

Weed management

- ❑ Mow along side of row to maintain the width of the bed to 3-4 ft.
- ❑ Weed growth can be very vigorous at the same time as the bramble crop peaks.
- ❑ Weed control is best done earlier in the season before harvest commences.
- ❑ Mow middles regularly to allow pickers to move through rows easily.

Insect and disease scouting (these will vary by region)

- ❑ Scout for insects
  - ❑ Raspberry crown borer (canes girdled and wilt)
  - ❑ Psyllid
  - ❑ Two spotted spider mite
  - ❑ June beetle
  - ❑ Japanese beetles
  - ❑ stink bugs
  - ❑ fire ants
- ❑ Scout for diseases
  - ❑ Botrytis
  - ❑ Rusts
  - ❑ Orange Felt (orange cane blotch) (blackberry)
  - ❑ Sooty blotch (blackberry)
  - ❑ Orange rust
  - ❑ Powdery mildew
  - ❑ Double blossom (blackberry)
  - ❑ Cane blight (blackberry)
  - ❑ Powdery mildew

Water management

- ❑ Bramble plants need about 1"-2" water/week, and this is amount is especially critical during harvest.
- ❑ For blackberries (not raspberries) in warmer climates only, consider installing an overhead system for evaporative cooling to reduce sunscald. Turn on once or twice a day from 10 am to 3 pm for short periods of time (approx. 15 minutes).
- ❑ Give plants a deep irrigation after harvest.

Nutrient management

- ❑ Take leaf samples after harvest and send to a clinic for nutrient analysis. Do not fertilize with nitrogen at this time of the year.

Harvest and marketing

The busiest time of the year for a blackberry or raspberry grower is the harvest season. Each plant needs to be harvested every 2-3 days. For larger plantings, that means fruit is picked from some part of the field every day of the week.

- ❑ Pick blackberries when shiny black for shipping. Those that are dull black are fully ripe and suitable for PYO only.
- ❑ Pick directly into clamshells with absorbent pads OR for PYO use soft drink flats.
- ❑ Keep harvested fruit in shade and move into coolers as soon as possible to lengthen the shelf life of the fruit.
- ❑ Use forced-air precoolers for best removal of field heat.
- ❑ Store at 32 to 34°F and 95% relative humidity.
- ❑ Freeze excess fruit for jam, juice or wine.

Fall Bramble Chores

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed and revised with the assistance of Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system.

Plant growth and development

- ❑ Primocanes continue to grow but slow down.
- ❑ Flower buds start to form in leaf axils on summer-fruiting types.
- ❑ Carbohydrates and nutrients in canes begin to move into the roots.
- ❑ Primocane leaves senesce late fall.
- ❑ Primocane fruiting types begin to flower in late summer/early fall and fruit matures until frost in fall.

Harvest

- ❑ Harvest primocane fruiting raspberries.

Pruning and trellising

- ❑ Spent floricanes should be removed as soon as possible.
- ❑ Optimal time to prune is after the coldest part of the winter is over. However pruning can start in late fall if plantings are large (late winter for smaller plantings).
- ❑ Start trellis repairs after plants have defoliated.

Weed management

Many spring and summer weed problems can be best managed with fall- and winter-applied preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with your state's agricultural chemical manual and local extension agent for the best labeled chemicals to control these weeds.

Insect and disease scouting

- ❑ Continue scouting for insects and diseases and treat with pesticides if necessary (follow recommendations in your state).
- ❑ Remove damaged canes from field as soon as possible to lessen the impact of the pest.

Planting

- ❑ Growers in southern areas can plant in the fall.
- ❑ In cooler areas, prepare list of cultivars for next spring's new plantings. Find the commercial small fruit nursery list at www.smallfruits.org

Nutrient management

- ❑ Take soil tests to determine fertility needs for spring plantings.
- ❑ If soil is bare, plant an overwintering cover crop (e.g. rye) to build organic matter and slow soil erosion.

Marketing and miscellaneous

- ❑ Order containers for next season.
- ❑ Make contacts for selling fruit next season.
- ❑ Plan on attending NABGA's annual meeting in Columbus, Ohio (mid-January) or the regional meeting in Savannah, Georgia (early January).