

# Spring Berry "To Do" List

**All Berries: Nutrition -** We are moving out of the optimum time to take foliar samples to instruct nutritional plans. The plants have begun senescence and nutritional values will not be accurate at this time. I would suggest referring to last years' results or to just follow a standard program to round out fertility. See below in the crop category if you have questions

**Cover Crops** - Cover crops planted in late summer will suppress annual weed growth, improve soil texture, provide organic matter, and may increase soil nitrogen. The cover crop can be incorporated in late fall or in the spring before planting. While it's too late this season to plant marigold or sudangrass, these cover crops have the potential to suppress nematode populations. Not listed in this chart is some of the mustards which have been shown to offer some biofumigation assistance, which may be helpful in controlling soil borne disease. Mustards are a challenge to include in a berry rotation due to timing.

Suitable cover crops to grow the year before planting berries.

Cover crop	Last day to plant	Seeding rate (lb/a)			
Winter Rye	October 1	80-100			
Oats*	September 15	60-100			
Wheat	September 15	80-100			
Vetch	September 1	30-40			
Ryegrass	August 15	15			
Barley*	August 15	75-100			
Sweet Clover	August 15	20			
Red clover	August 15	10-20			
Buckwheat*	August 1	75			
Marigold*	July 1	5-10			
Sudangrass*	July 1	50-90			

\* Will winter-kill

Source: 2017 Cornell Pest Management Guidelines for Berry Crops continued on next page

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SWD - If your blueberries and/or raspberries are softening and falling from the plant, there is little doubt in my mind that they are infested with SWD. This year is different than the last few years. Infestations are being found across the state. I've been encouraging people to follow the advice from the last Berry News – think of this insect more like a disease. It may help you wrap your head around the management strategy.

For the <u>current list of NY products for **berry crops**, click <u>here</u>. There is a separate page for each berry crop, and the materials and specific details are different for each one, so please read carefully.</u>

### Strawberries:

June bearing strawberries set flower buds in response to short days. As we get into late summer, strawberry plants respond by setting the flower buds that will result in the crop next spring. It is important to maintain appropriate nutrition and soil water status during this time. If you don't have the specific information from a foliar test, the general recommendations

are to fertilize strawberry fields with 20 to 50 pounds of actual nitrogen per acre during late summer. Nitrogen rates depend upon amount supplied at renovation and plant vigor. New fields with high vigor may not need additional nitrogen now, but older fields should benefit. Irrigation during this time is also extremely important if rainfall has not been sufficient in your area. We suggest about 1 inch per week. Continue to irrigate strawberries through fall to assure a good crop next year.

- Maintain good leaf health by controlling leaf diseases in June bearers. More specific information was in the last issue of Berry News, but basically if you have 10% of the leaves with 1 or more lesions, I would recommend a spray.
- Day Neutral strawberries have reached peak but should be protected from SWD. If the nights' stay cool and the days are warm and sunny, we could see a banner year. The other major concern is the market. Last year growers had some challenges selling some really beautiful fruit. Make sure to chill the berries immediately after harvest.



Day Neutral strawberries from the Berry Patch in Stephentown, NY (Courtesy DI Riggs)

Stay on top of scouting DN's - look for disease – especially leaf spot, but also crown anthracnose. Tarnished plant bug, thrips, leafhoppers and mites are insect pests of these berries. SWD can also be a real problem – pick clean and refrigerate berries immediately.

#### Brambles:

• Late summer raspberry growth looks much better than did spring growth.Continue to spray and monitor for SWD in fall raspberries. A real threat this year.

• There is no general recommendation for adding nutrients to bramble crops in the late summer or fall. If foliar reccs suggest nutrients are needed, nitrogen should be added in the spring, unless it's in a slowly available form like composted manure.

#### Blueberries

 Blueberry harvest is just about over in most areas. Many farms have closed due to SWD infestation. If you have been able to protect with insecticides or exclusion netting the crop still looks great! I anticipate that

there will be plenty of blueberries on farm stands this Labor Day weekend.

- NO fertilizer needed for blueberries after July 4<sup>th</sup>. And irrigation should be decreased so that the plants can go into dormancy.
- Powdery Mildew seen on blueberries at several farms. Infections occur at bloom – and this year conditions were perfect. If you are seeing this in your planting, you should make a note because spraying next spring would be helpful. Organic growers can use Oxidate – 3 applications at 5 day intervals around bloom. Quilt, Indar, Quash, Tilt, JMS Stylet Oil – all will help and should be applied before petal fall. Powdery Mildew causes early defoliation and can weaken plants over time.
- Blueberry maggot, cranberry fruitworm and cherry fruitworm larvae and damage have all been seen in plantings this year. Perhaps we've been focused on SWD and have forgotten that maggots in berries isn't a new thing......but we would like to keep them out! Petal – fall to pre-harvest is the window for these pests – make a note now if you are seeing them.

# For Your Information:

#### Berry Farm Worker Training Manuals Available

Cornell Cooperative Extension of Ulster County announces a new series of manuals for berry and grape producers. The manuals are designed for farmworker training and general reference, written in English with Spanish translations and including detailed illustrations. Click on each title to view sample pages:

Click off each title to view sample pag

<u>Bramble Harvest</u> (8 pages) <u>Methods of Pruning Grape Vines</u> (12 pages) <u>Pruner Sterilization: Preventing the Spread of Crown Gall of Grape</u> (8 pages) <u>Pruning Floricane (Summer) Raspberries and Pruning Primocane (Fall) Raspberries</u> (12 pages) <u>Spotted Wing Drosophila (SWD) Monitoring in Raspberries</u> (16 pages)

Copies are just \$6 - \$8 each and are available for purchase by mail using the order form here.

For assistance with ordering, contact Carrie at 845-340-3990 x311 or email <u>cad266@cornell.edu</u>.

If you have questions about the manuals, contact Jim O'Connell at 845-340-3990 x390 or email <u>jmo98@cornell.edu</u>.

Manuals funded by NE SARE. Translations provided by the Cornell Farmworker Program.

### <u>Cornell Fruit Resources Website</u> <u>– a brand new look!</u>

Cornell Berry, Tree Fruit and Grape webpages have been reworked and presented in an easier to use and more mobile friendly platform. Check them out by clicking on this link – and save it to your favorites.

# https://fruit.cornell.edu/



### Charcoal Rot of Strawberry

Steven Koike and Mark Bolda, Agriculture and Natural Resources, University of California

*Editors note*: This blog post from August 2, 2013 describes a disease that has been challenging California growers for some time. During the past several seasons, a few growers in eastern NY have seen similar symptoms but we haven't been able to get the problem identified. This summer, Dr. Kerik Cox at Cornell was able to isolate Charcoal Rot from a field. Although this is only a onetime problem, it's something that I would like growers to call about if they are seeing similar symptoms. Beginning at least as early as 2005 and continuing through 2013, collapsing strawberry plants from various parts of California have been associated with the soilborne fungus *Macrophomina phaseolina*. The disease, called charcoal rot, appears to be the most important current concern for the industry due to its steady increase over this period of time. Each year finds additional new fields infested, and the disease has now been found in all of the major strawberry producing counties in the state. In 2005-2006, charcoal rot was restricted to southern California in Orange and Ventura counties. Most recently this disease has been confirmed in Santa Barbara, Monterey, Santa Cruz, and Santa Clara counties. The spread of Macrophomina to new fields and counties portends that charcoal rot may be a long term threat to the industry which at present does not have satisfactory plant resistance with which to combat the pathogen.

Symptoms of Macrophomina infection in strawberry consist of wilting of foliage, plant stunting, and drying and death of older leaves, with the central youngest leaves often remaining green and alive. Plants can eventually collapse and die (Figure 1). When plant crowns are cut open, internal vascular and cortex tissues are dark to orange brown (Figure 2). Disease is often most severe if the infected plant is subject to stresses such as weather extremes, water stress (shortage of water), poor soil conditions, or heavy fruit loads. In locations where the disease has oc-



Figure 1. Charcoal rot results in the collapse and death of strawberry plants. Photo Steven Koike, UCCE

curred for more than one season, the patches can be quite large and appear to have spread from the initial problem area (Figure 3). Such patterns are consistent with the spread of a soilborne pathogen. It is noteworthy that in these cases we have never isolated other important, well known pathogens such as Colletotrichum, Phytophthora, or Verticillium. However, it is important to note that another recently described disease, Fusarium wilt, is also occurring in the same regions; symptoms of Fusarium wilt are identical to those caused by charcoal rot.

Macrophomina produces numerous tiny, black, irregularly shaped microsclerotia (Figure 4). These microsclerotia are survival structures that allow the fungus to persist for extended periods in the soil. The fungus is spread within and between fields mostly by the transport of contaminated soil during soil tillage and preparation operations. Spread of Macrophomina in strawberry fields deals with the same issue of field sanitation that concerns growers of many other commodities. Verticillium wilt (lettuce, strawberry,



Figure 2. Internal crown tissue of strawberry infected with Macrophomina will show a dark to orange brown discoloration. Photo Steven Koike, UCCE



Figure 3. Charcoal rot can affect large portions of a field and cause significant dieback. Photo Steven Koike, UCCE



Figure 4. Tiny, black microsclerotia enable the Macrophomina pathogen to survive in the soil. Photo Steven Koike, UCCE

pepper), clubroot (broccoli, cauliflower), Fusarium wilt (lettuce), Fusarium yellows (celery), and lettuce dieback disease (lettuce) are all problems caused by soilborne pathogens that are spread in infested soil.

#### Current management strategies involve the following:

(1) Crop rotation. Do not plant strawberry in fields having a known history of the problem and avoid back-to-back strawberry plantings in infested locations.

(2) Pre-plant fumigation. This remains a useful tool for managing Macrophomina and the other soilborne pests,

even though bed-applied fumigants may not provide complete control.

(3) Avoid stressing the plants. Stress will hasten the development and increase the severity of symptoms, so use appropriate growing and irrigation practices to reduce stress. Note, however, that even in the absence of stress, infected plants will eventually develop the disease.

(4) Sanitation. Growers with Macrophomina infested fields need to be concerned with limiting the spread of the fungus from infested to clean fields.

### Honeyberries, Haskaps, Blue Honeysuckle: Is There Commercial Potential? Written by Brian R. Smith, University of Wisconsin, River Fall

What are honeyberries and where do they come from?

Honeyberries are found within the rather large Honeysuckle family Caprifoliaceae, which encompasses about 14 genera and 400+ species of shrubs, woody climbers and a few herbaceous types.

Of the 14+ genera,

only the genus Lonicera contains the edible and com- rants and various small doses of bland, bitter, sour mercial honeyberries/haskaps. Within the Lonicera genus, the species caeruleais the primary source of importance. There are several subspecies of *caerulea*; edulis and kamtschatica, which are at the foundation of what is currently called the true honeyberry (found in eastern Siberia/Mongolia) and emphyllocalyx, which is called the haskap and found on Hokkaida Island in Japan. Russian and Japanese selections (and more recently, some North American wild selections) of these subspecies of *Lonicera* caerulea have served as the basis for breeding new adapted cultivars for North America. As one might expect, there is considerable variability in this germplasm from so many different geographic locations. For this article, I will use the term "honeyberry" from here on to simplify things.

Honeyberries are long-lived, very winter-hardy, mul- • ti- stemmed shrubs ranging from 2-7 feet with grayish -green foliage, yellow to white flowers and typically fruit that can be anywhere from round to oblong, but typically resembles a tub-



ular blueberry and can vary from blue to reddish-



purple, or even black. The ½-2"+ fruit usually weigh about 1.3-2.5 grams and are very edible, straight from the bush (unlike our Aronia friends) and can have widely different flavor mixes that would include hints of sweet blueberry, raspberry, plum or black cur-

or astringent overtones. Considerable variation also exists in bloom time and harvest; some honeyberries ripen with strawberries and a few do not ripen until almost aronia season (mid-late August). Dr. Maxine Thompson at Oregon State University and Dr. Robert Bors from the University of Saskatchewan have initiated breeding programs to improve the honeyberry for growing in North America. They have already released a series of cultivars that have greatly improved fruit size, flavor, adaptation and even some specifically for machine harvesting. It would appear that the University of Saskatchewan breeding program is introducing cultivars more adapted to our climate.

#### Interesting facts about honeyberries:

- Honeyberries are not at all invasive like other members of the honeysuckle family
- Many honeyberries are winter-hardy to between -40F and - 50F

- Honeyberries can live 50 years or more
- Honeyberries have 2-3X the level of antioxidants of highbush blueberries
- Honeyberries can grow in soils ranging from clay to sand
- Honeyberries have more vitamin C than an orange
- Honeyberries do not appear to be susceptible to many pests and could be good candidates for organic production
- Over 200 cultivars of honeyberries have been released in the last 60 years
- There are already about 1,200 acres of honeyberries planted in Canada, with estimated 75% of this in Quebec
- Some Russian cultivars were deliberately bred to be bitter-Small, cream-colored blossoms can withstand spring frosts down to 21°F.

#### Uses/products made from honeyberries:

Honeyberries can be used as a fresh 'dessert fruit' or can be frozen en masse or as IQF. Honeyberries can be dried into honey "raisins" or used in any typical drink or dessert, including smoothies, jams and dessert toppings, pies and cakes, ice cream, muffins, juice and yogurt. Honeyberries can even be made into wine or blended in wine coolers.

#### Yields, profitability and marketing:

Honeyberry plants are somewhat slow to reach full fruit production but should have some decent harvestable yields (2-5 lb./bush) by year 3 or 4. By year 6, they should be close to full production and range anywhere from 5-12 lb. /bush. Mechanical harvesting can be used on certain upright cultivars like 'Tundra'. Growers in Quebec seem to prefer the Oxbo/Korvan 9000 harvester. It can run at about 1 mph and will harvest 10 A/day. Most growers feel that a mechanical harvester is economically feasible with a 10 acre + orchard and can be used for up to a 40-acre orchard.

Smaller, tractor-drawn versions run about \$80,000. Growers that rent harvesters in the larger acreage areas pay around \$3,500 per 400 hours of use. For individual hand harvesting, a seasoned picker can harvest 6.5 -11lb/hr. It would take 28 people working 8 hr./day for 4 days to harvest an acre by hand. The cost/lb. for hand

harvest is about \$1-\$1.20, which would add up to about \$9,000. Honeyberries in the U.S. are selling for between \$5 and \$8/lb retail. Machine-harvested berries typically run \$3-\$4/lb.

On page 7 is a Cost of Production/Returns table for Haskaps/Honeyberries that I have modified more accurately for the U.S. and describes two scenarios (hand and machine harvests) from Years 0-8. Sections have been summarized and converted to US dollars. Yields assumed are 750, 1,500, 2,250 and 3,375 lb/A, respectively, for Years 3, 4, 5 & 6. Years 7 and beyond assume a yield of 3,750 lb/A. Although it is difficult to confirm accuracy, it would appear based on the research that I have conducted for this article, that these numbers should be quite conservative figures.

#### Site and growing requirements:

Honeyberries are no different from any other fruit plant in requiring the basics of full sun, good air drainage potential on frosty nights (planted at, or above the surrounding topography) and having the availability of water to prevent stress and promote a larger, higher quality crop. Basic wind protection from a windbreak on the north and west side of the planting will help prevent desiccation stress and could be used to facilitate snow deposition. The honeyberry cultivars that are listed later in this article should be able to produce well even in USDA Hardiness Zone 3. Honeyberries are also tougher and more adaptable than many fruit crops when it comes to soil conditions in that they can tolerate a pH of 5.5-7.5 and can grow in sand to clay, assuming there is good subsoil drainage. A well-drained sandy loam would be considered ideal. It is a good idea to always obtain a soil test before planting to reveal any large deviations in the desired nutrient, pH and organic matter levels. This will provide you with a roadmap of what to do and when, while giving you a baseline to start the planting off correctly. In general, base fertility levels should be near 65 lb. N/A, 90 lb. P/A and 355 lb. K/A. It is always a good idea to apply a liquid starter fertilizer such as an 8-32-16 at planting, which is especially easy if using a mechanical transplanter with a trip valve. Plant spacing for PYO are usually 3-5' apart within row and 8-10' between rows (somewhat cultivar-specific/ growth habit dependent) which translates to about 1,100 plants/acre. If one were designing a planting for mechanical harvest, then within-row spacing should be at the low end of the range to develop a hedgerow and between-row spacing should be stretched to 16'. Plant a non-competitive grass mixture in the alleys such as a

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Est.	Variables \$/A	YR o	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8
Costs	Land costs*	1,087	290	290	290	290	290	290	290	290
	Plants incl. royalty*	700	257	206	206	206	206	206	206	206
	Bird netting*	0	0	0	714	191	191	191	191	191
	Posts and wires for netting*	0	0	0	341	91	91	91	91	91
	Labor netting	0	0	0	610	610	610	610	610	610
	Labor Estab- lishment	681	68	0	478	0	0	0	0	0
	Weed control and mowing	501	501	501	501	501	501	501	501	501
	Pruning	0	105	205	205	319	319	319	319	319
	Pesticides	69	69	69	69	69	69	69	69	69
	Bumblebee colonies	0	0	0	228	228	228	228	228	228
	Fertilization	50	50	100	146	196	196	196	196	196
	Hand harvest (scenario 1)	0	0	0	1,047	2,048	3,185	3,185	3,185	3,185
	Machine Har- vest (Scenario 2)	0	0	0	446	887	1,338	2,007	2,230	2,230
	Total Costs Scenario 1	3,088	1,340	1,371	4,835	4,749	5,886	5,886	5,886	5,886
	Total Costs Scenario 2	3,088	1,340	1,371	4,234	3,588	4,039	4,708	4,931	4,931
Revenue	Scenario 1 \$5.46/lb	0	0	0	4,095	8,190	12,285	18,428	20,475	20,475
	Scenario 2 \$3.19/lb	0	0	0	2,393	4 ,785	7,178	10,766	11,963	11,963
Net Income	Scenario 1	-3,088	-1,340	-1,371	-740	3,441	6,399	12,542	14,589	14,589
	Scenario 2	-3,088	-1,340	-1,371	-1,841	1,197	3,139	6,058	7,032	7,032

## Costs and Returns for Honeyberries

AMORTIZATION (25% DOWN PAYMENT, 4% INTEREST RATE, 10 YEARS PAYBACK PERIOD). Based on Haskap Permaculture: A New Opportunity for Commercial Producers. Cost of Production Study 2014. Atlantic Canada and Northern Canadian Regions. Phytocultures Ltd.

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combination of a hardy variety of perennial ryegrass + sheep fescue. Maintain a 4-5' weed/grass-free band centered over the honeyberry row to prevent competition from the grass.

Honeyberries have perfect flowers (both male and female parts in the same flower) but are often self-sterile and require a pollinizer cultivar that not only has a compatible different genetic background but also significantly overlaps in bloom time. Recommended pollinizers are included for each cultivar description provided. Some growers are going with a 1:1 (both cultivars equally desirable and can pollinize one another), 1:2 (cultivar X is a more desirable cultivar than the pollinizer) and others with a 1:8 pollinizer strategy (cultivar X is highly desirable, such as for mechanical harvesting and pollinizer has excellent bloom overlap and highly crossfertile (notice even here that all plants of cultivar X border a pollinizer.

#### 1:2 Pollinizer Strategy

х	Ρ	х	х	P	х	x	Ρ	X
х	P	x	x	Р	x	x	Р	x
х	Ρ	х	х	Р	х	х	Ρ	х
х	Р	х	х	P	x	x	Р	x
х	Ρ	х	х	P	х	х	Ρ	x
х	P	х	x	Р	х	x	P	x

#### 1:8 Pollinizer Strategy

		_				_		
х	х	x	х	х	х	x	x	x
x	P	х	х	P	х	х	P	х
x	x	х	x	х	x	x	х	х
x	х	х	х	х	x	х	x	x
x	Р	x	x	Ρ	x	x	Р	х
х	х	х	х	х	х	х	х	x

The choice you make may change because some cultivars vars have very desirable pollinizer companion cultivars and others not so much. If one goes much past the 1:8 pollinizer ratio, there could be major consequences if one of the pollinizer plants dies or if poor pollination conditions prevail. Whatever your strategy, it will not be effective unless you include bumblebees or honeybees in the picture when it comes time for that first harvest year.

Timing of planting your honeyberry orchard depends on the growth stage of plant materials you receive. Dormant plants can be planted any time the soil can be safely worked in the spring but plants that arrive already leafed out in pots have probably not been acclimated and should not be field planted until they have been (takes 3+ weeks). Non-acclimated should be able to be planted safely by the middle of May in most years. Watering is critical to the survival, establishment and early fruiting of honeyberries as it is with most crops. A thorough deep-soaking should occur as soon after planting as possible and then 1"/week on average. Water applied through drip irrigation is the most efficient and minimizes weeds and foliage and fruit diseases. Mulches are not necessary but can be especially advantageous on sandy sites; a mulch of 3-4" would work best.

Honeyberries are typically less afflicted by pests than most fruit crops. However, a few have surfaced in various commercial plantings. Among these more common insect pests are leafrollers, aphids, and scale; while spider mites can quickly multiply under hot and dry conditions some years. I also have some anecdotal evidence that Japanese beetles do not seem to be attracted to honeyberries. In my potted plant nursery on campus that covers over a ¼ acre, I have fruit plants in 1-25 gallon pots that include grapes, strawberries, aronia, stone fruit, and pome fruit and 25 honeyberries in 5 gallon pots. None of the honeyberries were touched and there was feeding on multiple fruit species in and around those honeyberries! Diseases that occasionally occur are powdery mildew, botrytis, downy mildew, black spot, rust, Alternaria, anthracnose and various leaf spots.

It is certainly desirable to have a low-maintenance fruit crop like honeyberries but "low" does not mean "no" when it comes to maintaining that all-important vegetative vs. reproductive vigor, especially when the plants are quite young and again, when they are fullyestablished and at maximum yield potential. A careful analysis of watering and fertilizing practices and plant response should be noted and adjusted to the situation. Honeyberries should also be pruned after the first 3-4 years; preferably in late February or March up until bud

-break. The goal is to leave 4-6 of the most vigorous and Tundra (Kiev#8 x Tomichka; Kurile x Russian type) healthy older stems, a few strong 1-yr.-old stems and hopefully encourage 2-3 new, vigorous shoots. Also, be sure to remove any damaged, diseased or weak wood. Once your planting is old enough to harvest, you should prune every 1-2 years but do not remove more than 25% of the plant. Remember, the more you prune, the more you invigorate; but if you prune too much, you will not have any fruit!

Honeyberries are quite precocious, so they may try to fruit earlier than they really should, which can have long-term effects on establishment and longevity of your planting. Honeyberries are best kept more on the "vegetative vigor" side of things for the first couple of years and if they have established well, you can start promoting fruiting by Year 3. Since honeyberry fruit are very attractive to birds, you will probably want to have a system for covering them with bird netting (hole size should not exceed ½").

#### **Cultivars and nursery sources:**

Perhaps the most important subject has been left for last. The correct cultivar will impact every aspect of your operation, from pruning and harvest to marketing and profitability. New cultivar releases are mirroring the interest by growers and the general public; each improvement feeds interest to the next level of expansion. Although I would never say that it is bad to have so many new cultivars, it presents quite a quandary for the grower. Since this is a new industry and many cultivars are just being released for Midwest adaptation (both Canada and U.S,) incremental improvements are also being made for better fruit quality, size and yield. This fact also means that even slightly older cultivars are being eclipsed on a regular basis. What should theoretically be a cultivar/plant investment for 30-50 years may actually need to be replanted earlier than that because of the competitive advantage of the 5 newest cultivars in a new industry (think about how fast just one cultivar like Honeycrisp even changed the much older apple industry). However, that conundrum does not really offset the fact that there could be some good profitability in this crop if you choose what appear to be the best cultivars right now. Most for our climate are originating from Bob Bor's program in Saskatoon, but there are probably some very viable exceptions from elsewhere. Due to limitations on space, I have only included the cultivars originating in Saskatchewan:

Good flavor and firmness and very appropriate for mechanical harvesting and sorting. Average berry size is 1.5 grams and tends to be long to flat and ovoid; more firm skin and less scar bleeding than other cultivars. Great for IQF processing. Mature height is 4-5'. Best pollinizers are 'Aurora', 'Honeybee', 'Polar Jewel', 'Berry Blue' and 'Cinderella'.

Aurora (Solovey x MT46.55; Russian x Japanese type) -Very large, elongated oval 2.2g fruit are sweet and juicy. Very productive and ripens early July in Saskatchewan. Easy harvest due to fruit visibility and lower bush retention. Mature height is 5-6' bush. High mildew resistance.

Borealis (Kiev#8 x Tomichka; Kurile x Russian type) -One of the best tasting of any. Less firm than Tundra and some scar bleeding; not suited to mechanical harvesting or sorting. Strictly home garden or PYO. Fragrant, white flowers. Precocious. Short and flat boxy berries average 1.6 grams and are somewhat hidden by foliage. Plant at maturity is 4'. Best pollinizers are 'Aurora', 'Honeybee', 'Berry Blue' and 'Cinderella', 'Polar Jewel', 'Night Mist', 'Midnight Blue'.

Indigo Gem (Sel. 9-15; same parentage as 'Borealis')-Good flavor and appears to have some good characteristics for processing and has very high yields (up to 2X that of others). Short, ovoid berries (1.3g) are said to be "chewy". Best pollinizers are 'Aurora', 'Honeybee', 'Polar Jewel', 'Berry Blue' and 'Cinderella'. Mature plant height is 5-6'. Some susceptibility to mildew on leaves.

Honeybee (Suvenir x F-1-9-58, known as 'Blue Pacific'; Russian x Kurile type) – Developed as a great pollinizer cultivar for 'Tundra', 'Borealis' and 'Indigo" series. Tartflavored, 1.9 g, elongated fruit on a large bush (5-6'+). Productive, precocious and fast-growing. Cylindrical shape and strong fruit retention could allow for the production of honeyberry raisins but primarily used for juice, wine or jelly due to stem retention on berries. 'Honey Bee' pollinized best by 'Borealis'.

Indigo Treat (Sel. 9-91; same parentage as 'Borealis')-Excellent flavor. Berries are considered flat cylindrical, and average 1.4g. Appears to be suitable for mechanical harvesting. Best pollinizers are 'Aurora', 'Honeybee', 'Berry Blue' and 'Cinderella'. Mature height is 4-5'.

Boreal Blizzard (Sel. 22-06-25.5)- Fruit are "surfboard"continued on next page

shaped, average a very large 2.8g and have excellent flavor, meaty texture and good firmness. Harvest typically overlaps with strawberry season (early-mid-June, southern WI, late June to July, northern WI). Late bloom (4-7 days post Tundra and Indigo series). Best pollinizers would be 'Boreal Beast', 'Indigo Gem', 'Tundra', 'Honey Bee'. Vigorous and upright growth habit. Very productive and has excellent resistance to mildew and sunscald.

**Boreal Beast** (Sel. 14-16-9.25)- Fruit average 2g. and have excellent flavor with a very nice aftertaste, whether fresh or frozen. Late bloom; best pollinizer is 'Boreal Beauty'. Ripens after 'Aurora' and 'Boreal Blizzard' (mid-late July in Saskatchewan). Strong, upright growth habit and excellent resistance to mildew. Suitable for mechanical harvesting. Not available until Fall 2018.

**Boreal Beauty** (Sel. 21-12-11.5)- Very unusual late bloom time and very late ripening; up to a month after other cultivars. Firm, thick oval to thick heart-shaped 2.6g, excellent-flavored berries. Best pollinizer is 'Boreal Beast'. Strong, upright growth habit and mildew-resistant. Very productive. Suitable for mechanical harvesting.

**Indigo Yum** (Sel. 9-92; same parentage as 'Borealis') - May not be considered as good a flavor by some due to tanginess. Berries are long and flat-ovoid and average 1.3g. Best pollinizers are 'Aurora', 'Honeybee', 'Berry Blue' and 'Cinderella'.

Other cultivars available include Berry Smart Blue (Czech # 17), Sugar MountainTM, Berry Blue, Blue Bird, Blue Nova, Polar Jewel, Blue Hokkaido, Blue Forest, Blue Moon, Blue Sea, Blue Sky, Cinderella, SoloTM 'Kapu', MaxieTM 'Kuchi', Honey BunchTM 'Kaido', Sugar PieTM 'Hoka', Keiko, Tana, Taka, Kawai, Chito, Happy Giant, Blue Moose, Honey Delight, Bunny Blue, Strawberry Sensation, Blue Treasure, Giant's Heart, Blue Banana, Blue Stuart, Blue Angus, Honey Gin, Blue Palm, Kamchatka, Wojtek and Zojka.

### **Calendar of Events**

 Decmber 5-7, 2017 – Great Lakes Expo. Devos Place Conference Center and The Amway Grand Plaza Hotel, Grand Rapids, MI. Registration opens September 25, 2017. Go to <u>http://glexpo.com</u> for more details on program and registration.

December 12-14, 2017 – New England Vegetable & Fruit Conference. This is the premier fruit and vegetable conference in the New England with over 30 information sessions over 3 days, many Farmer-to-Farmer information sharing sessions each day, over 150 vendors in an expansive trade show, and networking opportunities with and expected 1,500 participants. This conference offers valuable information for growers of all levels of experience from prospective growers or new entry beginners to well seasoned experienced growers, different sized operations from homestead to large commercial farms, and a range of growing systems including organic, IPM, conventional, greenhouse/tunnels, and many others. This year's conference has incorporated some new programming that will expand the value of . Come see what's doing and how attending this conference can help your farm. See the website for program and registration information as it becomes available. Go to <a href="https://newenglandvfc.org">https://newenglandvfc.org</a>.

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