Weekly Update

Are the blueberries OK?

<table>
<thead>
<tr>
<th>1 – Dormant or tight bud</th>
<th>2 – Bud swell</th>
<th>3 – Tight cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Dormant or tight bud" /></td>
<td><img src="image2" alt="Bud swell" /></td>
<td><img src="image3" alt="Tight cluster" /></td>
</tr>
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- **Plant part:** Flower bud.
- **Description:** No visible swelling of the fruit buds. Bud scales tightly closed. No visible signs of growth.

- **Plant part:** Flower bud.
- **Description:** First sign of growth as plant growth begins in the spring. Visible swelling of the flower buds; outer bud scales begin to separate at the tip revealing paler interior bud scales. This bud stage can usually tolerate cold temperatures of 10 to 15°F (-12 to -9°C).

- **Plant part:** Flower.
- **Description:** Individual flowers are distinguishable in the flower cluster. This bud stage can tolerate 20 to 23°F (-7 to -5°C).

<table>
<thead>
<tr>
<th>4 – Early pink bud</th>
<th>5 – Late pink bud</th>
<th>6 – Full bloom</th>
</tr>
</thead>
<tbody>
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<td><img src="image4" alt="Early pink bud" /></td>
<td><img src="image5" alt="Late pink bud" /></td>
<td><img src="image6" alt="Full bloom" /></td>
</tr>
</tbody>
</table>

- **Plant part:** Flower.
- **Description:** Expanding flowers are readily visible and have separated. The pink corolla tubes (petals) are short and closed. This bud stage can tolerate 23 to 25°F (-5 to -4°C).

- **Plant part:** Flower.
- **Description:** Individual flowers fully developed. Expanded corollas are now white but still closed. This bud stage can tolerate 24 to 27°F (-4.4 to -2.8°C).

- **Plant part:** Flower.
- **Description:** Most of the flowers on the bush have opened. The bloom stages can tolerate 28°F (-2.2°C).

“Serving the research and educational needs of vegetable and small fruit growers in Albany, Columbia, Fulton, Greene, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, Warren, & Washington Counties”
There are several different species of scale that can infest a blueberry planting. Putnam scale (*Diaspidiotus ancylus*) may be the most common in New York State while Terrapin scale is often associated with southern plantings. Other scale insects that can be problematic include *Le-canium*, oystershell and cottony maple scale among a few others.

Scale, if left unchecked, can cause defoliation, loss of vigor and eventual death of the plant. Scale is frequently associated with plantings that have not been vigorously pruned, although I have seen scale in very well managed plantings. Scale can infest new and old wood and can also cause damage to fruit. Any planting over the age of 6 years is vulnerable.

The scale insect carries an armored shell called a derm. This shell provides protection as the insect underneath it is soft bodied and easy to kill. Under the shell or ‘derm’, the adult female scale lives and grows. She mates and lays a mass of eggs under the derm. The adult male is winged. He emerges from his derm and mates with a female but does not feed.

In mid-to late May (in an ordinary spring!) the eggs hatch and the ‘crawlers’ emerge from the derm. This stage is very mobile and will move around the plant and to neighboring plants. The crawlers look like 6 legged mites with two flattened antennae. As scales mature they become less energetic and start feeding. The scale will then molt and flatten out and start to form the waxy scale covering. Scales secrete honeydew which supports black sooty mod which is often the first sign that there is a problem with the plants.

Dormant oil should applied to blueberry bushes on warm days (>50°F) in late winter before flower buds begin to open. The oil is an effective way to kill overwintering scale. It is important to get a good covering of oil to ensure control. Mix 2-3 gallons of oil in 100 gallons of water and apply 50 to 100 gallons of water per acre (depending on bush size).

Because scale is often found on lightly or poorly pruned plants, you need to insure that the plants are pruned on an annual basis. Follow the pruning with a dormant oil application right when young crawlers are emerging from the scale covering. Treat from early March to first bloom with three gallons of Superior oil mixed into 250-300 gallons of water applied at 300-400 psi. This amount of spray should allow thorough coverage of an acre of blueberries. Do not apply oil sprays at 32°F or below and do not apply oil when temperatures rise into the upper 70’s. A quiet, cloudy, 50-60 degree day is best. Oil should NOT be applied with lime sulfur, which is often used to control *Phomopsis cane blight* in blueberries as sulfur is incompatible with oil.

Other materials that could be used to control scale include Molt-X or AzaSol both of which contain the active ingredient azadirachtin. Molt-X requires crop oil adjuvant. Brigade is a restricted use chemical that can be used but you are limited to 0.5 lb/acre per season. Esteem is also labeled and can be applied at delayed dormant.

There are reports that parasites and predators may help control the terrapin scale including chalcid wasps and lady-beetle, *Hyperaspis binotata*. These same predators may work on Putnam scale and other scale insects. –*LGM*
So I know that potato seed is being delivered and picked up and in some cases even planted! But, I wanted to include something in the newsletter about how to properly cut and handle potato seed and the best information I found is by Steven B. Johnson from the University of Maine. We have excerpted most of the article and pictures from the bulletin, but not all of it. If you want to see the full Bulletin, either go to http://www.umext.maine.edu/onlinepubs/pdfpubs/2412.pdf or call me (859-6213) and I will send a copy to you.

Potato Facts: Selecting, Cutting and Handling Potato Seed by Steve Johnson, University of Maine, Cooperative Extension Bulletin # 2414

Selection of good seed is a critical decision faced by every potato grower. A good crop starts with good seed. The same amount of fertilizer, pesticide and effort is put into a crop from poor seed as into a crop from good seed. Choosing seed that is both physiologically young, has been handled gently and stored carefully is also important.

Choose Disease-Free Seed: Inspect seed for disease symptoms. Some disease symptoms can be treated, but the presence of others should be grounds to reject the seed. If more than 20 small or 10 large Rhizoctonia sclerotia are visible on one side of the seed tuber, consider using a different seed source. Seed with less than 20 small or 10 large sclerotia should be treated before use.

Organic control products include Serenade Max (for Suppression only). For improved performance add surfactant such as NuFilm to improve coverage. Actinovate AG is a streptomycycin and is also appropriate for control.

The most susceptible cultivars to mummyberry are ‘Earliblue’ and ‘Blueray’. Another disease that we might want to spray for would be Botrytis Blossom and Twig Blight (Botrytis cinerea). Use Ziram 76 DF (3 lb/A) as an aid in control at green tip. This might be even more important given the temperature stress that the buds will be under this year.

Vegetable Updates

Selecting, Cutting and Handling Potato Seed

At green tip, which is the stage that almost everyone in the reading area is at (some more or less green), there are two diseases that blueberry growers should be consider applying a crop protectant for. Mummyberry (Monilinia vacciniicorymbosi) is the first disease and many ears I would not worry too much about this disease because we hadn’t seen much of it in eastern NY. Sadly, last year was a bit of a game changer. Mummyberry appeared in several well managed plantings that had never had it before. One easy way to control mummyberry is to disturb the soil by raking the mulch under the blueberry bushes just prior to bud break. The fruiting body will fail to produce spores when disturbed. An early season prophylactic spray might also be called for. At green tip you can use Abound, Captan 50WP or CaptiEvate 68 WDG. Also Switch, Indar 2F, Orbit or PropiMax EC may be used. Before to consult the Guidelines before spraying as each of these materials has different caveats and label directions.

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—LGM
Seed lots with more than one percent of tubers showing blackleg symptoms or soft-rot symptoms should not be used. The presence of pinkeye, early blight or late blight lesions on the tubers could act as inoculum for new crop infections. This seed should not be used. Know the source and history of a seed lot and try to avoid those that have had heavy infection with *Verticillium* spp.

Seed-borne scab can contaminate a field without a history of scab and should be used only in fields with a history of scab. Seed with scab should be treated to control this disease. High levels of scab on the seed warrant rejection of the seed lot. Adjusting pH of the fields greatly aids in the control of scab.

Generally, a “five percent rule” applies with seed lots. A seed lot with five percent or more total defects is too high to use. Seed is a large investment. Each grower should strive to use the highest quality seed obtainable.

**Physiological Age of Seed:** The physiological age of seed is an important factor in choosing potato seed. Factors affecting the physiological age of tubers include growers season stress, storage temperature and time. Temperature is very important because warmer storage temperatures will speed the aging process of the tubers. Since precutting seed also ages the seed physiologically, it helps to understand the stages of aging.

To determine the physiological age of seed potatoes, gather a sample, place them indoors and allow them to sprout. Observe the sprouts that come from the sample to determine the physiological age of the seed. There are distinct stages through which potato seed passes.

**Dormant Seed:** If potatoes do not sprout at all, they may still be in a period of dormancy. Most potatoes undergo a dormant or resting period. The length of dormancy varies with the variety. There are chemical and nonchemical means to break or greatly reduce the dormancy period.

**Young seed:** Young seed is characterized by apical dominance. Young seed will have one or just a few sprouts. These sprouts emerge from eyes on the apical or bud end of the tuber. There is a strong, internal inhibitor that keeps eyes on the center and stem end of the tuber from sprouting. Eyes distant from the apical end may never sprout. Young seed will produce a plant with few stems. A low stem number leads to a low tuber set. Larger, but fewer tubers would be expected from young seed.

**Middle-aged Seed:** Middle-aged seed will have multiple sprouts. All the eyes on the potato could sprout. There is no clear apical dominance; eyes from the bud end, the middle and the stem end will sprout. Middle-aged seed produces plants with multiple stems that lead to high tuber sets.

**Old Seed:** Old seed will have branched sprouts that can appear hairy. These sprouts are weak, and they will not produce a vigorous plant. Typically, plants from old seed will produce high tuber sets, but the plants lack the vigor to bulk the tubers to a desirable size.

**Potato No Top:** Seed can be so old that small tubers form on the sprouts once they emerge from the eyes. “Potato No Top” is the name given to this disorder of extremely old seed. Seed with “Potato No Top” disorder should not be used. Any stress during the growing season produces potatoes that are physiologically older than those grown without stresses.

**Precutting Seed:** Once good seed is selected, the decision must be made whether or not to precut the seed. Precutting seed potatoes involves warming the tubers, cutting them to size and cooling the seed pieces back down to a holding temperature. Not all seed potatoes should be pre-cut. Only seed of young or middle physiological age should be precut, since precutting ages the seed. Seed that is young can be precut up to one month before planting. If the seed has previously sprouted, the seed should be cut only two weeks ahead. Middle-aged seed can be precut up to two weeks ahead of planting only if it has not sprouted. Middle-aged seed that has sprouted and been desprouted is old seed. Seed that is physiologically old should not be precut. Old seed should only be cut a few days ahead of actual planting. Cutting any earlier may cause aging and “Potato No Top”. 
The temperatures at which to warm the seed and hold the cut seed vary from different aged seed. The younger the seed, the higher the cutting and holding temperatures. Young seed can be cut and held at about 50 degrees F. Older seed should not be warmed or held above 45 degrees F. Since sprouting ages the tuber, temperatures should be lower for seed that has already sprouted.

Precutting offers several advantages that will help potato seed overcome adverse soil conditions at planting and avoid dormancy factors of some varieties. Precutting seed potatoes advances the physiological age of the tubers. Also, it allows the cutting operation to begin earlier, when labor is less in demand, before planting starts. Precut potatoes may have a better opportunity to cure under controlled storage conditions. Properly cured cut seed, if held for three or four weeks, will overcome dormancy and give more uniform sprouting. Precut seed will provide earlier emergence, vigorous early growth and higher plant and stem populations. Varieties that have slow see curing ability, such as “Atlantic” and “Kennebec,” are good candidates for precutting.

Delayed emergence, slow, uneven establishment and reduced plant stands are all symptoms of planting seed in soil that may have been either too cold, too wet or even too dry. Freshly cut seed planted under these unfavorable conditions often fails to heal properly; it becomes dehydrated or infected by decay organisms and is not capable of good growth. Erratic and slow plant growth also interferes with timely herbicide and hilling practices; missing hills and smaller plant canopies later in the season offer less competition to weeds.

Adhere to temperatures and timing set by the physiological age carefully. Keep in mind that the cutting, the warming and the holding will all advance the physiological age of the seed. Remember, precutting is not for all seed. Planting fresh cut seed is recommended when seed needs to be planted right away.

Cutting Seed Pieces: Once good seed has been selected and the decision to cut has been made, proper seed cutting and handling is essential. Properly cut seed pieces feed correctly in the planter and provide uniform plant stands. Mechanical cutters can handle large volumes of seed and cut tubers into two or four pieces. Hand cutting minimized the number of blind pieces, but is slow and labor intensive.

Potatoes should be warmed prior to cutting. Seed tubers should not be washed. Do not try to salvage diseased potatoes or those that are breaking down. Grade out bent or very rough tubers for hand cutting. Size seed potatoes before cutting. Tubers under 1.5 ounces should not be planted. Tubers weighing between 1.5 ounces but under three ounces should be planted whole. Three- to five-ounce seed tubers should be cut into two pieces. Five- to seven-ounce tubers should be cut into three pieces. Sort out seed over 10 ounces for cutting by hand, or, preferably, for sale to other markets.

Disinfect all equipment before each seed cutting session and between seed lots. Calibrate the seed cutter daily and between lots. Keep the seed cutter knives sharp and straight to prevent ripping the potato surface. Ripping provides an ideal area for disease organisms to attach the seed.

Proper Seed-Piece Size: The size of a potato seed piece affects early plant vigor a great deal. Larger seed pieces usually emerge faster than smaller ones.

Cut seed tubers into blocky pieces about 1.75 ounces in size. Discard poorly cut seed pieces, such as slivers or slabs. Remove seed pieces ripped or torn by dull knives. Each seed piece should have at least one eye. For varieties with poor eye distribution, such as “Atlantic” and “Shepody,” consider cutting seed pieces closer to two ounces each.

An ideal seed size range is between 1.5 ounces and two ounces. Seed pieces should average slightly larger at two to 2.5 ounces for “Russet Burbank” and similar varieties, with larger spacing between seed pieces. Seed pieces larger than three ounces many have...
some difficulty feeding through a planter. Planters require that at least 70 percent of the seed be in the 1.5 to three-ounce range.

Higher total yields are generally associated with larger seed pieces, but at some point the seed piece size will not result in increased yield. Bruise problems are more severe with very large seed pieces. Excess bruising increases the risk of seed decay problems. There is a greater cut surface area per seed piece with large seed. More stored energy will be used for wound healing and less is left to support new plant growth. Emergence will likely be slowed and plants will be less vigorous. A good rule is to keep the number of cut surfaces per tuber to a minimum.

Undersized seed pieces can contribute greatly to the number of doubles or triples planted. Oversized seed pieces can cause skips and are also prone to fall out of the planter.

To assess your seed cutting operation, assess the weight distribution of the cut seed. If hand cutting, demonstrate the proper seed sizes and shapes to seed cutters. No more than 10 percent should be less than one ounce or more than 2.5 ounces. If there are 100 seed pieces in 10 pounds, the average size is 1.6 ounces; if there are 91 seed pieces, the average size is 1.75 ounces; if there are 80 seed pieces, the average size is two ounces. County out 100 seed pieces and weigh them – 9.4 pounds would have an average size of 1.5 ounces, 10.9 pounds would have an average size of 1.75 ounces, and 12.5 pounds would have an average size of two ounces.

Curing Cut Potato Seed: Cool the cut seed to 38 to 40 degrees F (<45 degrees F), and do not pile it more than six feet deep. Good air circulation will keep the temperature uniform and prevent carbon dioxide buildup, which interferes with wound healing. Relative humidity levels of 85 to 95 percent are needed to promote healing and prevent dehydration.

Six to 10 days at these conditions will complete the curing process. If there is too much air flow and not enough humidity, a thin skin may form on the cut surfaces. This thin layer is not enough to provide wound protection and can be easily sloughed off when handled. Warm the seed tubers before taking them from storage, unless sprouting is a problem. Re-warm seed again for two days before planting to get sprouts growing again and to avoid condensation on the seed. Remember that this practice does not overcome deficiencies of poor quality seed.

Handling Cut Seed: Care in handling cut potato seed is perhaps the most underrated aspect of commercial potato production. Cut potato seed is much more easily bruised than whole potatoes of similar weights. The most vulnerable areas of the seed pieces are the edges of the cut surfaces. Very small impacts can damage cells on the edges of the cut seed. These damaged areas allow decay organisms present on the seed or in the soil to infect the seed piece. Damaged cells may not heal.

Seed-tuber and seed piece bruise is beginning to be recognized for its importance. Bruise problems are more severe (both before and after cutting) with larger seed tuber sizes. As seed tuber size increases, there are more cut surfaces, more right angle cuts and greater cut surface areas per seed piece. The number of cut surfaces on the seed piece affects the rate of emergence, the rate of early growth, stem numbers, set, grade and final yield. The more cut surface area on the seed piece, the greater the seed decay potential, the slower the emergence, the more stored energy in the seed that is dedicated to wound healing and suberization and, therefore, the less that is left to support new plant growth.

Planting Quantity per Acre:
The quantity of seed required per acre depends on the average seed piece size and the seed piece spacing. Larger seed has been shown to produce bitter yields in some varieties. Keep in mind, however, that many other factors besides seed piece size and physiological age of the seed piece determine the final yield. These include soil temperature at planting, accuracy of the planter, soil moisture, fertility and diseases.