Ohio Fruit ICM News
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Calendar

November 9: OFGS Board Meeting, 9 a.m. - 4 p.m., Dutch Heritage, Bellville.

November 15: Ohio Ag and Hort Human Resource ManagersForum, Hilliard, OH. 10:00 am - 2:30 pm. Registration and fee requested by November 8. Check Issue #39 for details.

November 17: OFGS Research Committee Meeting, 10 a.m. - 2 p.m., Williams Hall, Rm 123, OARDC, Wooster.

November 17: OAMP (Ohio Apple Marketing Program) Committee Meeting, 3 p.m.-7 p.m., Researchers Services Bldg, Rm 130, OARDC, Wooster.

December 6-8: Great Lakes Fruit, Vegetable, and Farm Market EXPO, DeVos Place Convention Center, Grand Rapids, Michigan. For additional information, visit <http://www.glexpo.com>

December 15: OFGS Research Committee Meeting,

10 a.m. - 2 p.m., Dutch Heritage, Bellville.

December 19: In-Depth Fruit School on Intensive Fruit Production - A Systems Approach, 8:00 AM - 4:30 PM. Featuring presentations by Dr. Dave Ferree, Ohio State Professor Emeritus and expert on light management in intensive systems and Steve Hoying, Cornell Pomologist with 20 years experience researching tree fruit planting systems. Adams County Agricultural and Natural Resources Center, Gettysburg, PA. Contact Person: Tara Baugher, tab36@psu.edu or 717-334-6271, ext. 314.

January 4-6, 2006: North American Berry Conference. Please note that this conference is being held more than a month earlier than usual. Therefore, those planning to attend need to register and make other arrangements earlier than in other years. This meeting is being held at the Savannah International Trade and Convention Center in Savannah, GA, and is immediately followed by the SE Regional Fruit and Vegetable Conference, January 6-8. More information is available at <http://www.nasaga.org>.

January 16-18, 2006: Ohio Fruit and Vegetable Congress and Ohio Direct Marketing Conference, Columbus Convention Center.

Cold Acclimation in Strawberries

Source: Pam Fisher, Ontario Ministry of Agriculture and Food via Massachusetts Berry Notes, Nov.1, 2005 Volume 17, Issue 15.

The process of developing tolerance to cold temperatures is called acclimation. Cold acclimation in strawberries begins when days get shorter in late summer. Short days alone will trigger strawberries to develop tolerance to -2° or -3°C (28° or 26°F). For further acclimation, plants must be subjected to cold temperatures, i.e. days of about 10°C (50°F) and nights around 0°C (32°F). Photosynthesis is also required for cold acclimation to occur, so plants that are mulched before these conditions have been met will not be as winter-hardy.

Even when fully acclimated, or hardened-off for winter, strawberry plants are not as tolerant of cold temperatures as other perennial fruit crops. Cold injury to crowns appears as browning of crown tissue. Crowns will be killed at temperatures of -12°C to -14°C (10.4° to 6.8°F) in the crown, but even tissue temperatures of -6°C to -9°C (12° to 15°F) can lead to fewer leaves, leaf distortion, and fewer flowers and fruit.

The extent of cold-temperature injury in strawberries is determined by many factors. These include the extent of cold acclimation, the cultivar, the part of the plant affected, the rate and duration of freezing, and cultural practices. Rapid freezes, when tissue temperatures drop 2 to 3 degrees per hour, are fatal. Although the duration of freeze also affects how much injury occurs, most injury occurs in the first 24 hours of damaging temperatures.

Freeze/thaw/freeze cycles will also cause more injury than consistently cold temperatures, if the thaw lasts more than 2 to 3 days. Nutrient and water status of strawberry plants also affects cold acclimation. Excess or deficient nitrogen will inhibit acclimation. Optimum levels of phosphorous promote acclimation. Plants acclimated under dry conditions fare better than plants which are not slightly water-stressed.

Mulching is important to prevent cold-temperature injury. Snow is the best insulator against the cold, but snow is not consistently present throughout the winter in much of Ontario (or New England).

Straw mulch, applied from mid-November to mid-December, provides good winter protection. Straw mulch also moderates soil temperatures and prevents freeze-thaw cycles which can damage plant roots and lift crowns out of the soil. Wheat straw or oat straw are good mulching materials, applied at 2.5 to 3.5 tons per acre. This mulch should be applied after two or three good hard frosts, but before temperatures reach -7°C to -9°C (19° to 16°F) for extended periods.

Most growers apply mulch between mid-November and mid-December. The settled straw mulch should be about 2" to 3" thick. A light rain or snow after the straw is applied will help settle the straw so it doesnt blow away.

Be sure the straw is clean and free from weed seeds. However, do not use straw that was treated with glyphosate before harvest. We have observed glyphosate injury in the spring on several occasions, where the straw mulch was treated with glyphosate before harvest.

More straw is needed when raised beds are used. Raised beds can be 4° to 6°C colder than flat beds, but mulching overcomes most of this negative effect. Growers who grow strawberries on raised beds covered in black plastic often use a heavy-weight floating row cover, such as Typar 518,instead of straw. It is reported that the combination of black plastic lined beds, with a floating row cover, provides adequate winter protection, even in colder regions of the northeastern USA.

It's a beautiful fall. With cool sunny days, cool nights, and some hard frosts, strawberry plants will be going through the process of acquiring winter hardiness. If cool weather continues, you can say good night to your strawberry plants and tuck them in with a nice warm blanket in mid-November to mid-December. (Originally used in the Ohio Fruit ICM News, Vol. 8, No. 38, Oct. 21, 2004)

Cultural Practices for Disease Control in Brambles
Source: Mike Ellis, Mizuho Nita, the Ohio State University, OARDC, Organic Small Fruit Disease Management Guidelines, <http://www.oardc.ohio-state.edu/fruitpathology/organic/PDF/OSU-Organic-Bramble- Diseases.pdf> via Massachusetts Berry Notes, Nov.1, 2005 Volume 17, Issue 15.

The use of any practice that reduces or eliminates pathogen populations or creates an environment within the planting that is less conducive to disease development must be used. Cultural practices are the major means of control for several important bramble diseases. The following practices should be carefully considered and implemented whenever possible in the disease management program.

Use Virus-Indexed Planting Stock

Always start the planting with healthy,virus-indexed nursery stock from a reputable nursery. The importance of establishing plantings with virus-indexed nursery stock cannot be overemphasized, since the selection of planting stock and planting site are the only actions a grower can take to prevent or delay the introduction of most virus diseases. Plants obtained from an unknown source or neighbor may be contaminated with a number of pathogens that experienced nurserymen work hard to control.

Site Selection

Proper site selection is critical to developing a successful disease management program. Establishing a planting on a site that is conducive to disease development is a critical error. Such plantings may be doomed to failure, regardless of the amount of pesticide a grower uses. The following considerations should play a major role in the disease management program.

Soil drainage: Soil drainage (both surface and internal drainage) is an extremely important consideration when selecting a planting site. Planting brambles on poorly or even marginally drained sites is a poor management decision. For example, poorly drained soils that are frequently saturated with water are highly conducive to the development of Phytophthora root rot, especially in red raspberries. Even in the absence of plant disease, wet soils are not conducive to good plant growth and productivity. Any practice such as tiling, ditching, or planting on ridges that aids in removing excessive water from the root zone will increase the efficacy of the disease management program. Once the planting is established, it is difficult, if not impossible to improve soil drainage.

Site Exposure (Air Circulation and Sunlight Exposure): Avoid sites that do not have full exposure
to sunlight, such as shaded areas near woods or buildings. In addition, sites with poor air circulation that tend to accumulate still, damp air should be avoided. Planting rows in the direction of the prevailing winds will help promote good air circulation and rapid plant drying. The primary reason for the above considerations is to promote faster drying of canes, foliage, and fruit. Most plant pathogenic fungi and bacteria require water on plant surfaces in order to penetrate and infect the plant. Any practice that reduces wetness duration (speeds drying time) of susceptible plant parts is beneficial to the disease management program.

Previous Cropping History: Avoid establishing plantings on sites that have a previous history of problems with Verticillium wilt, either in previous plantings of brambles or other susceptible crops. In general, it is not a good practice to plant brambles immediately after solanaceous or other Verticillium-susceptible crops, such as tomatoes, potatoes, peppers, eggplant, melons, strawberries and other related crops. Certain common weeds, such as black nightshade, redroot pigweed, lambs-quarters, and horse-nettle will also support growth of the Verticillium fungus, and fields with a high population of these weeds should also be avoided.

This is particularly important if Verticillium wilt is known to have been a problem on the site in the past. The fungus that causes Verticillium wilt can survive in soil for very long periods of time (at least 14 years in California). If a site is known to have had a problem with Verticillium wilt within the last 5 to 10 years it should probably not be used for establishing plantings of Verticillium-susceptible bramble cultivars unless the soil is fumigated before planting.

Most brambles are susceptible to Verticillium wilt, and when the disease becomes established within the planting it can be devastating. Resistance to Verticillium wilt in the cultivars currently grown in the Midwest is not available. In general, black raspberries are significantly more susceptible than red raspberries, and (in general) blackberries are the least susceptible.

If the site has a previous history of Phytophthora root rot, either in previous bramble plantings or other perennial fruit crops, it should probably be avoided. Phytophthora spp. (like Verticillium) can also survive in soil for extended periods of time. It is important to remember that Phytophthora root rot is usually associated with poorly drained (wet) sites, and improving soil drainage is one of the principal means of control.

If nematodes have been a problem in previous crops or they are suspected to be a problem on the site, a soil analysis to determine the presence of harmful nematodes should be conducted. Nematodes are most likely to be a problem on the lighter (sandy) soils. Nematode sampling kits and instructions on taking samples can be obtained through your Extension office. Infested sites may be treated with an approved nematicide before planting if sampling indicates a need to do so.

Proximity (closeness) to established bramble plantings and wild bramble plants: Ideally, a new planting should be isolated as far as possible from old established plantings and wild bramble plants that serve as reservoirs for diseases and other pests. The benefits of using virus-indexed plants to establish a new field are greatly reduced if the fence row around the planting or a woods directly adjacent to the planting contains wild, virus-infected or orange rust-infected plants. The same is true if a new planting is established next to an old planting that has disease problems.

Currently, no information is available on exactly how far away from an established planting or weeded area is far enough.The distance of 600 to 1000 feet is used commonly in Extension literature; similarly, the New York State virus certification program requires that nurseries in the program use a minimum distance of 1,000 feet. It is probably safe to say the farther the better.

Crop Rotation (Replanting Brambles) When replanting brambles on the same site, the practice of crop rotation must be considered. Due to the build up and persistence of soilborne plant pathogens, replanting brambles on the same site is not recommended without the use of crop rotation. Soil fumigation is not an option in organic production systems.

At present, data describing how long a rotation is required before replanting brambles on the same site is not available. In fact, this requirement is probably different for every different planting site. Once again, the safest recommendation is probably the longer, the better,particularly if the site has a history of soilborne diseases.

All soilborne diseases, however, are not the same. For instance, Verticillium wilt generally becomes a problem only after populations of the Verticillium fungus slowly build up to high levels. Thus, if no brambles or other susceptible crops are grown for a suitable period (probably at least 5 years), the fungus population declines and brambles can be reintroduced and grown for a number of years before the population builds back up to damaging levels. This same principle is true for many harmful nematodes, but it is not true for Phytophthora root rot. The Phytophthora fungi reproduce very rapidly under proper environmental conditions, so even a low population can rebuild to damaging levels within one or two seasons.

Crop rotation will not eliminate all problems associated with soilborne diseases. It should always be integrated with other control measures, such as the choice of resistant or partially-resistant cultivars, improvements in drainage, etc. Where other control measures cannot be used (for instance, the site cannot be adequately drained), it is not advisable to replant brambles.

Avoid Excessive Fertilization

Fertility should be based on soil and foliar analysis. The use of excessive fertilizer, especially nitrogen, should be avoided. Sufficient fertility is essential for producing a crop, but excessive nitrogen can result in dense foliage that increases drying time in the plant canopy, i.e., it stays wet longer. Research has shown that excessive use of nitrogen can result in increased levels of Botrytis fruit rot (gray mold).

Control Weeds In and Around the Planting

Good weed control within and between the rows is essential. From a disease-control standpoint, weeds in the planting prevent air circulation and result in fruit and foliage staying wet for longer periods. For this reason, most diseases caused by fungi are generally more serious in plantings with poor weed control than in those with good weed control. Furthermore, some disease-causing organisms (Verticillium wilt fungus, crumbly berry virus) can build up on certain broadleaf weeds in the planting.

Any practice that opens up the canopy in order to increase air circulation and reduce drying time of fruit, foliage, and young canes is generally beneficial to disease control. Controlling wild brambles (which are weeds) near the planting is also important, because they can serve as a reservoir for several important diseases and insect pests.

Sanitation (Removal of Overwintering Inoculum)

The fungi that cause anthracnose, cane blight, spur blight, Botrytis fruit rot, cane and leaf rust, and several other important diseases overwinter within the planting on canes infected during the previous year. Pruning out all old fruited canes and any diseased new canes (primocanes) immediately after harvest and removing them from the planting

breaks the disease cycle and greatly reduces the inoculum. All infected pruning waste should be removed from the field and destroyed. If you are attempting to minimize fungicide use, good sanitation (removing old fruited canes) is critical. If old fruited canes cannot be removed before winter, they should definitely be removed before new growth starts in the spring.

For fall bearing raspberries, such as Heritage, all canes are cut off each year. Removing all cut canes from the planting will aid the disease management program. If it is impossible to remove pruned canes from the field, they should be chopped in place as quickly as possible with a flail mower to speed decomposition before new canes emerge.

Plant population and canopy management: Any practice that alters the density of the plant canopy and increases air circulation and exposure to sunlight is generally beneficial to disease control. Optimizing between row and within-row spacings and maintaining interplant spacings through judicious cane thinning throughout the life of the planting is desirable. Ideally, rows for red raspberries should not be over 2 feet wide and should contain about 3 or 4 canes per square foot.

Control of plant vigor, particularly through avoidance of high levels of nitrogen and careful use of cane vigor control techniques, can greatly aid in improving the canopy density. Specialized trellis designs for various Rubus spp. can further improve air circulation and increase exposure to sunlight, as well as increase harvest efficiency. Trickle irrigation, as opposed to overhead sprinkler irrigation, greatly reduces the wetting of foliage and fruit and the risk of splash dispersal of several important fungal pathogens.

Removing young fruiting shoots (before they exceed 4 inches in length) from the lower portions of canes (approximately the lower 20 inches) will remove fruit that might become soiled. This practice also removes shoots that disproportionately contribute to shading and poor air circulation in the canopy.

For information on methods for cane vigor control, trellis designs, and optimum spacing requirements, the following book is very useful: Bramble Production Guide, edited by Marvin Pritts and David Handley. It can be purchased from Northeast Regional Agricultural Engineering Service, 152 Riley-Robb Hall, Cooperative Extension, Ithaca, NY 14853. Phone: 607-255-7654.

Inspect the Planting Frequently and Rogue Out (Remove) Diseased Plants
Plants showing symptoms of virus diseases, rosette, or orange rust must be removed and destroyed
immediately, including the roots, whenever they are found. These plants may bear fruit, but it will be of poor quality. The longer these plants remain, the greater the chances that other plants will become infected. Viruses and the orange rust fungus are systemic and can move to adjacent plants via root grafts. Because of this possibility, use a flag to mark the locations where diseased plants are removed so the adjacent plants can be checked frequently for new symptoms.

For orange rust, it is particularly important to inspect the planting early in the growing season. The planting should also be inspected on a routine basis (at least once a week) from the time growth starts in the spring through harvest. New leaves of early spring growth on orange rust infected plants are chlorotic (yellowish), shoots are bunched and spindly. They are easy to identify in the spring.

It is important that infected plants be identified and removed prior to the development of the orange rust pustules on the leaves. If these pustules are allowed to develop, they will produce large numbers of aeciospores which will spread the disease. If infected plants are not removed early in the spring, they become more difficult to identify later in the growing season.

Early spring is also a good time to inspect for virus diseases. Symptom expression of many viruses is more obvious during cool growing conditions. The higher temperatures of mid-to late summer often reduce virus symptoms, making infected plants difficult, if not impossible, to detect.

Adjust Production Practices to Prevent Plant Injury and Infection
Many plant pathogens take advantage of wounds in order to penetrate and infect the plant. Therefore, any practice that minimizes unnecessary physical damage to the plant is beneficial to the disease
management program. Cane blight and bacterial crown gall are two important pathogens of brambles that enter the plant almost exclusively through wounds.

The use of sharp pruning tools will help minimize damage to canes during pruning operations. Prune only when necessary (avoid cosmetic pruning of primocanes) and avoid pruning during periods when plants are wet or immediately before wet weather is forecast. Most plant pathogens require water on the surface of plant tissues before they can penetrate the plant. Providing proper cane support through trellising or otherwise tying the canes will aid greatly in avoiding abrasions from sharp spines and wind whipping of plants during windy conditions. Proper spacing between rows and the use of the proper size equipment will also prevent plant damage.

Proper Harvest, Handling, and Storage of Fruit
Proper harvesting and storage methods are critical components of the disease management program. It is of little value to produce high-quality fruit in the field if it is bruised or crushed during harvest or permitted to rot during storage. Raspberry and blackberry fruit are very perishable. Even under the best conditions,these tender fruits are extremely susceptible to physical damage and post harvest rots.

The following practices need to be considered well in advance of initiating the harvest. The proper implementation of these practices will aid greatly in providing your customers with the best quality fruit possible.

a) Handle all fruit carefully throughout all phases of harvest, transport and sale. Bruised or crushed (leaky) fruit are much more susceptible to fungal infection and rot than firm, intact fruit.

b) Harvest all fruits as soon as they are ripe. During periods of warm weather, harvest may require picking intervals as short as 36 to 48 hours. Pick early in the day before the heat of the afternoon. Overripe fruit in the planting will attract a number of insect pests and provide a source for inoculum buildup of fruit rotting fungi.

c) It is highly desirable to combine harvesting and packing into one operation. This prevents unnecessary handling and additional physical injuries.

d) If possible, train pickers to remove damaged or diseased berries from the field. Some growers have programs where they pay the picker as much, or more, for damaged berries picked into separate containers, than for healthy berries. This is a good sanitation practice that reduces inoculum levels of fruit rotting fungi in the field. Providing hand-washing facilities in the field so pickers can periodically clean their hands, should be helpful in reducing the movement of fungus spores that are encountered by touching rotten (diseased) berries.

e) Pick into shallow containers. Ideally, fruit should be no more than 3 to 4 berries deep; this greatly reduces bruising and crushing the fruit, which results in juice leakage that encourages the development of fungal fruit rots.

f) Refrigerate fruit immediately after harvest. Fruit should be cooled as close to 32°F as possible within a few hours after harvest. This temperature should be maintained throughout storage and, if possible, throughout shipment and sale. If you do not have refrigeration, fruit should be placed in the coolest place possible. Never allow the fruit to sit in the sun.

g) Avoid condensation of water on fruit after it is removed from cold storage. This is best accomplished by enclosing it in a waterproof over-wrap before it leaves the refrigerated area. The over-wrap should be kept in place until the fruit temperature has risen past the dew point.

h) Sell the fruit immediately (Move it or lose it.) Many berries produced in the Midwest are sold to pick-your-own customers or directly at farm markets, and are not refrigerated prior to sale. Customers should be encouraged (educated) to handle, refrigerate, and consume or process the fruit immediately in order to assure the highest quality possible. We must remember that even under the best conditions, raspberry and blackberry fruits are very perishable.

Weather Station Location	Oct Prec	Nrm'l Oct Prec	Year-to-date Prec	Nrm'l Y-T-D Prec	Avg High Temp	Nrm'l High Temp	Avg Low Temp	Nrm'l Low Temp	Oct Mean Temp	Nrm'l Meam Temp
Akron-Canton	3.89	2.53	37.28	32.45	61.2	61.1	44.7	42.1	53.0	51.6
Cincinnati	2.21	2.96	33.52	35.86	66.0	66.4	46.2	44.9	56.1	55.6
Cleveland	2.53	2.73	35.18	32.18	61.8	60.7	46.9	43.6	54.5	52.2
Columbus	1.33	2.31	35.28	32.40	64.3	65.4	46.5	44.0	55.4	55.7
Dayton	3.11	2.72	39.76	33.20	62.8	63.5	46.1	43.6	54.5	53.5
Fremont	1.70	2.26	32.11	29.19	65.4	63.6	40.7	40.9	53.1	52.2
Kingsville	2.65	4.30	31.56	33.20	61.9	61.5	47.3	43.2	54.6	52.4
Mansfield	2.60	2.68	34.39	36.31	60.7	61.7	43.7	41.1	52.2	51.5
Norwalk	3.78	2.21	37.56	29.96	62.5	61.5	45.5	40.1	54.0	50.8
Piketon	0.97	2.40	19.89	35.80	67.2	65.8	43.9	41.4	55.6	53.6
Toledo	0.27	2.35	24.41	27.79	64.5	62.1	44.1	41.5	54.3	51.8
Wooster	2.93	2.25	31.08	30.64	63.1	63.8	43.0	40.6	53.1	52.2
Youngstown	2.55	2.46	35.37	31.99	61.0	60.6	44.4	40.9	52.7	50.8

Temperatures in degrees F, Precipitation in inches
Table Created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC & Local Data

Terminal Market Wholesale Fruit Prices November 3, 2005

Chicago: <http://www.ams.usda.gov/mnreports/HX_FV010.txt>

Apples: Market about steady.
Cartons tray pack MI U.S. Fcy Jonathan 100s 17.00

Cartons 12 3-lb film bags MI U.S. ExFcy Red Delicious 2 1/2" min 13.50
Golden Delicious 2 1/2" min 13.50
Gala 2 1/2" min 15.00
Mcintosh 2 1/2" min 13.50
Jonathan 2 1/2" min 13.00-13.50 some 14.00
Paula Red 2 1/2" min 13.50

Bushel cartons loose MI U.S. One Golden Delicious 2 1/4" min 12.00-13.00
Jonagold 2 1/4" min 12.00-13.00
Ginger Gold 2 1/4" min 12.00-13.00
Paula Red 2 1/4" min 12.00-13.00

Grapes: Market about steady. 12 qt baskets MI Concord 21.00 fr appear 17.50

Detroit: <http://www.ams.usda.gov/mnreports/DU_FV010.txt>

Apples: Market steady
Cartons tray pack MI U.S. ExFcy Red Delicious 113s 16.00-16.50
Empire 88s 20.50-21.50 100s 20.50-21.50 138s 15.00-15.50
Honeycrisp 80s 52.00-52.50 100s 47.00

Cartons cell pack MI U.S. ExFcy Mcintosh 96s 20.50-21.50
NY U.S. ExFcy Mcintosh 100s 23.50-24.00

Cartons 12 3-lb film bags MI U.S. ExFcy Red Delicious 2 1/2" min 12.00-13.50 mostly 12.00 few 14.00-14.50 2 1/4" min 11.50-12.00
Golden Delicious 2 1/2" min 12.00-13.50 mostly 12.00 few 14.00-14.50 2 1/4" min 11.50-12.00
Granny Smith 2 1/2" min 12.00
Fuji 2 1/2" min 13.00-13.50
Royal Gala 2 1/2" min 13.00-13.50 some best 16.50-17.00 2 1/4" min 11.50-12.00
Red Rome 2 1/2" min few 14.00-14.50
Mcintosh 2 1/2" min 12.00-12.25 mostly 12.00 some best 16.00-16.50
Jonathan 2 1/2" min 13.00-13.50 few 14.00-15.50
Empire 2 1/2" min 12.00 few best 15.00-15.50
Idared 2 1/2" min 14.00-14.50

MI U.S. Fcy Red Delicious 2 1/4" min 10.00-10.50
Golden Delicious 2 1/4" min 10.00-10.50
Gala 2 1/4" min 10.00-10.50
Mcintosh 2 1/4" min 10.00-10.50
Jonathan 2 1/4" min 10.00-10.50

Bushel cartons loose MI No Grade Marks Red Delicious 3" min 13.00-15.00
Golden Delicious 2 3/4" up 13.50-14.00
Granny Smith 2 3/4" up 13.00
Gala 3" min 13.50-14.00
Jonathan 3" min 13.50-14.00
Empire 2 3/4" up 13.00 3" min 15.00
Honeycrisp 2 1/2" up 44.00-45.00

Grapes: Market steady cartons 12 1-pt containers MI U.S. One Concord med 19.00-20.00

Pittsburgh: <http://www.ams.usda.gov/mnreports/PS_FV010.txt>

Apples: Market about steady.

Cartons tray pack WV Comb U.S. ExFcy-U.S. Fcy Red Delicious 88s 16.00 125s 13.50 138s 13.50
Golden Delicious 88s 16.00 125s 13.50 138s 13.50

Cartons cell pack NY Comb U.S. ExFcy-U.S. Fcy Mcintosh 100s 24.00
U.S. Fcy Mcintosh 80s 17.50 100s 17.50

Cartons 12 3-lb film bags NY Comb U.S. ExFcy-U.S. Fcy Cortland 2 1/2" min 15.50
PA U.S. Fcy Red Delicious No Size Marks 14.50
Golden Delicious No Size Marks 14.50
Rome No Size Marks 14.50
Empire No Size Marks 14.50
Jonagold No Size Marks 14.50
Stayman No Size Marks 14.50

Bushel cartons loose PA No Grade Marks Red Delicious No Size Marks 14.50
Golden Delicious No Size Marks 14.50
Rome No Size Marks 14.50
Empire No Size Marks 14.50
Jonagold No Size Marks 14.50
Stayman No Size Marks 14.50