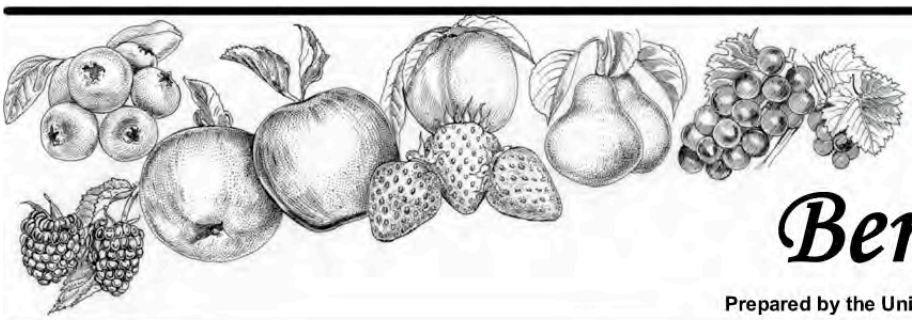

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Berry Notes

Prepared by the University of Massachusetts Fruit Team

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Massachusetts Berry Notes Underwriters:

NOURSE Growers of the Finest Small Fruit Plants

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IN THIS ISSUE:

Time to renew: Once again we've come to subscription renewal time for Massachusetts Berry Notes. Subscription costs remain at $10 per year thanks to the generous underwriting by Nourse Farms. This year we're asking again if you might add a contribution in support of UMass Extension's Fruit Program to your annual subscription renewal. A donation to the UMass Extension Fruit Program will support quality research and educational programming. Examples of some current initiatives include:

- research/demonstration on fall bearing blackberry varieties Prime Jim® and Prime Jan® in high tunnels (*supported by North American Bramble Growers Assoc. and Massachusetts Fruit Growers Assoc.*)
- research on the use of growth regulators for runner suppression in strawberries to save labor and increase yields (*supported by New England Veg & Berry Growers Assoc. and North American Strawberry Growers Assoc.*)
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- educational publications to inform growers about recommended best management practices for fruit production in New England (*various guides, fact sheets and UMass Fruitadvisor website*)

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Don't forget, the New England Vegetable & Fruit Conference in Manchester, NH December 11-13, 2007. Register today!

STRAWBERRY

Chateau, a New Herbicide for Strawberries

Scott Guiser, Penn State University

Chateau 51 SW or WDG (flumioxazin) is a new herbicide that is labeled for matted row and plasticulture strawberry production. Let's look at how it might fit in a strawberry weed control program.

Chateau is primarily a pre-emergent herbicide but will control some small emerged weeds if a non-ionic surfactant is added. It may be used with hooded and shielded application equipment in strawberry row middles, broadcast over dormant plants, or applied 30 days pre-plant and before laying plastic for plasticulture systems. The application rate for all uses and soil types is 3 ounces per acre.

Some important winter annual weeds that are controlled include chickweed, henbit, horseweed (also known as marestail) and Shepherd's purse. So, a fall cleanup spray to dormant matted row berries may be a good fit for this product. Plants should be fully dormant which means that we should have experienced several hard frosts. Be sure not to apply Chateau to frozen ground. So, these applications will be restricted to that narrow 'window of opportunity' in late fall.

For plasticulture growers, the pre-plant or shielded applications may be a good substitute for the standard pre-emerge products. The label requires that pre-plant application be made a minimum of 30 days before planting and may be tank mixed with a post-emerge product to control emerged weeds. Shielded applications can be made to row middles only and should not be made after fruit set.

Note that Chateau is also labeled for pome (apple and pear) and stone fruits (peaches, cherries,) and grapes at higher labeled rates for long term residual weed control. It should be tank mixed with a post emerge herbicide if established weeds are present. See the supplemental label for details.

For more detailed information and a label for Chateau consult the manufacturer's Web site, www.valent.com. You will have to download or request the supplemental label for Chateau use on strawberries. (***Source**: The Vegetable & Small Fruit Gazette, December 2007*)

RASPBERRY

Cultural Practices for Disease Control in Brambles

Michael Ellis and Mizuho Nita, The Ohio State University

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, lamb's-quarters, and horsenettle 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 or 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 ft. 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. (***Source***: *Ohio Organic Small Fruit Disease Management Guidelines for Raspberries and Blackberries)*

Cultural Practices for Disease Control in Blueberry Production Systems

Michael Ellis and Mizuho Nita, The Ohio State University

The use of any practice that provides an environment within the planting that is less conducive to disease development and spread should be used. The following practices should be carefully considered and implemented in the disease management program.

Use Disease-Free Planting Stock
Always start the planting with healthy, virus-indexed plants obtained from a reputable nursery. Remember that disease-free plants are not necessarily disease resistant: cultivar selection determines disease resistance.

Site Selection
Soil Drainage (Extremely Important)- Select a planting site with good water drainage. Avoid low, poorly-drained wet areas. Good water drainage (both surface and internal drainage) is especially important for control of Phytophthora root rot. This disease requires free water (saturated soil) in order to develop. If there are low areas in the field that have a tendency to remain wet, this is the first place that Phytophthora root rot will develop. Any time there is standing water in the field, plants are subject to infection. Any site in which water tends to remain standing is, at best, only marginally suited for blueberry production and should be avoided.

Any practice, such as tiling, ditching, or planting on ridges or raised beds, that aids in removing excessive water from the root zone will be beneficial to the disease management program.

Site Exposure
A site with good air circulation that is fully exposed to direct sunlight should be selected. Avoid shaded areas. Good air movement and sunlight exposure are important to aid in drying fruit and foliage after rain or irrigation. Any practice that promotes faster drying of fruit or foliage will aid in the control of many different diseases.

Weed Control
Good weed control is essential to successful blueberry production. From the disease control standpoint, weeds in the planting prevent air circulation and result in fruit and foliage staying wet for longer periods. Several diseases can be more serious in plantings with poor weed control versus plantings with good weed control.

In addition, weeds will reduce production through direct competition with blueberry plants for light, nutrients, and moisture and will make the planting less attractive to pick-your-own customers, especially if you have thistles!

Sanitation
Any practice that removes twigs or branches infected and other plant debris from the planting is beneficial in reducing the amount of fungal inoculum. Removal of fruit mummies is critical for mummy berry control. Removal of infected twigs and branches is also critical for control of Phomopsis twig blight and Fusicoccum canker. Infected plant material should be removed from the planting and destroyed.

Maintaining proper soil conditions
One of the most common problems in midwestern blueberry plantings is iron chlorosis. Affected plants are chlorotic (yellow) and stunted. The major cause of chlorosis is planting on a site with improper ph. The best soils for blueberries are well-drained sandy silt loam or silt loam, with pH 4.5 to 5.2, organic matter of 4 to 7% and adequate phosphorus and potassium. At pH levels above 5.2, chlorosis will probably be a problem.

Most soils will need to be adjusted in pH. Too low a pH can result in manganese or aluminum toxicity, while a high pH results in the unavailability of certain nutrients such as iron. Do not plant blueberries without amending the pH at least 1-2 years before planting. Soil test kits are available from your local county Extension office. Where top and subsurface soils have a naturally high pH (6.0 to 8.0) and there is a high buffering capacity, soil amendments will not adjust the pH and blueberries should not be planted. Where soil pH is too low, apply lime to increase the pH. Sulfur can be used to decrease the pH to the proper level if the pH is not too high. Incorporate sulfur and organic matter into the raised bed (upper 6 to 12 inches) 3 to 6 months prior to planting. This allows time for the chemical reaction to occur and reduces potential root damage. Retest the soil 3 to 6 months after application to determine whether further adjustments are needed. Apply all nutrients according to soil test. Phosphorus will not move through the soil and is ineffective after plant establishment. Applying sulfur to only the raised bed may require 500 to 800 pounds per acre of bed to decrease the pH by 0.5. Incorporate sulfur at least 3 weeks before planting.

In major commercial blueberry areas, blueberries are produced on sandy soils with high water tables. Most midwestern soils (except some Michigan and Wisconsin soils) require soil amendments and irrigation for maximum growth and yield. Tile drainage may be required, but in most midwestern soils containing 10% or more clay, raised beds are preferred for optimal growth. A raised bed 8 to 10 inches high (original height) and 4 feet wide is required.

Over time, the bed will compact to 6 inches, but the addition of hardwood or other suitable mulches maintains a height of 6 to 8 inches.

Protect from winter injury
Winter injury predisposes blueberry plants to many diseases. In colder regions of the Midwest, pile snow around bushes to insulate from fluctuating temperatures. Protect crowns (base of plant at soil line) with wood-chip or straw mulch.

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.

Harvesting Procedures
a) Pick fruit ***frequently*** and early in the day before the heat of the afternoon (preferably as soon as plants are dry). Picking berries as soon as they are ripe is critical. Overripe berries will cause nothing but problems during and after harvest.

b) Handle berries with care during harvest to avoid bruising. Bruised and damaged berries are extremely susceptible to rot.

c) Train pickers to recognize and avoid berries that have disease symptoms of mummy berry or anthracnose. If at all possible, have pickers put these berries in a separate container and remove them from the field.

Post Harvest Handling
a) Always handle fruit with care during movement from the field to market to avoid any form of damage.

b) Get the berries out of the sun as soon as possible.

c) Refrigerate berries immediately to 32 to 35°F in order to slow the development of fruit rots.

d) Market the berries as fast as possible. Encourage your customers to handle, refrigerate, and consume or process the fruit immediately. Remember that even under the best conditions, blueberries are quite perishable. (***Source***: *Ohio Organic Small Fruit Disease Management Guidelines for Blueberries*)

GRAPE

Evaluation of Grape Varieties for Certified Organic Production – Neely-Kinyon Trial, 2005

Kathleen Delate, Andrea McKern, Bob Burcham, Iowa State Univ.

Introduction
In 1899, Iowa ranked 11th in the United States in grape production and sixth in 1919. When the focus was shifted to corn and soybean production in the 1930s and 1940s, grape production decreased and with the introduction of the corn herbicide 2,4-D, damage sustained from herbicide drift in the remaining Iowa vineyards was significant enough to cause a great decline in Iowa grape production. In 2000, Iowa had an estimated 30 acres of grapes in production, and continues to grow (Domoto, 2005).

Materials and Methods
On May 25, 2001, four cultivars of grapes (six vines per cultivar) were planted at the Neely-Kinyon Research Farm: Bluebell, Edelweiss, Foch, and Frontenac. Vines were planted 7 feet apart with 9 feet between rows. The vineyard, after the last vine planting, measures 50 feet by 72 feet.

All vines received a 5-lb application of composted turkey litter (Ultra-Gro®, Ellsworth, IA) with a chemical analysis of 2.2-2.8-1.5 (N-P-K), and a 6-in. layer of straw mulch applied to the base of each vine in 2001. In 2004, 5 lb of hoophouse compost was applied to established vines and worked into the surrounding soil. Straw mulch was reapplied to the base of the established vines to maintain a 6-in layer on June 11, 2002, July 16, 2003, and May 17, 2005. Kentucky bluegrass was planted in the late spring of 2002 between vine rows to maintain a ground cover in vineyard middles. The ground cover was maintained by mowing, on May 17 and June 20, 2005. Vines were supported by untreated wood staples until established. Four alyssum plants were transplanted between the third and fourth vine of each variety to attract beneficial insects on June 5, 2002. The single-cordon trellis system was constructed on June 5, 2002, consisting of vertically placed steel posts 6.5 feet out of the ground with two wires strung between the posts at 3.5 and 6 feet from the ground. The mulched area surrounding the vines was weeded by hand on June 17, 2005. Vines were pruned on April 19. Shoot positioning and cluster thinning was conducted on June 20, 2005.

All vines were sprayed with Champion Wettable Powder® (NuFarm, Burr Ridge, IL) and lime (Good Earth Horticulture, Inc., Lancaster, NY) at 3 lb of Champion®, 6 lb of lime, and 100 gallons of water per acre on May 19, June 3 and 15, and July 6 and 20, 2005. Entrust™ (Dow Agrosciences LLC, Indianapolis, IN) was applied at 2 oz/acre to all vines on August 18 to control lepidopteran pests.

The Bluebell and Edelweiss cultivars were harvested August 17, and Frontenac vines were harvested August 30, 2005. Due to bird damage, there was a limited 'Foch'

harvest. Brix data was taken on the Foch culivar on September 1, and Frontenac on September 2, 2005.

Results and Discussion

There was a significantly greater cluster weight in the 'Bluebell' and 'Edelweiss' varieties compared with the other varieties. There were also significantly more clusters per vine in the 'Bluebell' variety compared with all other varieties. Subsequently, similar to results from 2004, yields were significantly greater in the 'Bluebell' cultivar at 1.37 tons/acre, compared with all other cultivars, averaging 0.51 tons/acre (Table 1). Disease symptoms were considerably reduced in 2005 compared to 2004, however, and grape quality was excellent.

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Acknowledgments

We would like to thank the Leopold Center for Sustainable Agriculture for their support of the Neely-Kinyon projects. We thank the Wallace Foundation for their input and support. Thanks also go to Greg Lilly, Daniel Rosmann, Alzbeta Novotna, and Mark Rosmann for their help on production, data collection and analytical aspects of this project.

Table 1. Plant performance in the organic grape variety trial, Neely-Kinyon, 2005.

Variety	Yield (ton/ac)	Brix (°)	Productivity (clusters/vine)	Average cluster weight (g)
Bluebell	1.37a	N/A	70.00a	32.01ab
Edelweiss	0.81b	N/A	32.17b	39.92a
Foch	0.25c	20.5	18.67b	22.12c
Frontenac	0.48bc	21.0	31.00b	26.69bc
LSD 0.05	0.45	NS	18.97	8.36

(**Source**: Organic Ag Infor *http://www.organicaginfo.org/* research report)

GENERAL

Developing Specialty and Value-Added Agricultural Products

Steven A. McKay, Cornell Cooperative Extension

Our New York and Federal governments are recognizing the market potential of specialty and value-added agricultural crops by making funding available to producers in the form of grants and specialized staff. NYS Ag and Markets offers grants each year that fund Pride of New York projects, as well as innovative specialty product development. The Pride of New York marketing campaign has made local produce and processed products more visible to consumers. It's a branding program that helps consumers recognize that a product is from New York. The federal government has grants and resources available that are described at the following web site: www.usda.gov/documents/SPECIALTY_CROPS.pdf

Adding value to raw farm products is one of the ways that producers can improve the viability of an agricultural enterprise. I'd like to review some of the considerations in developing a value-added product which can be a processed product or a raw product that may have been produced, sorted or packaged in a unique way.

Before developing a new value-added product one must do a feasibility study and marketing plan. The formality of this work will depend on how large the venture is projected to be, with larger projects requiring more detailed studies. The important thing is to be reasonably certain that you'll be able to sell the product to be developed. Remember that marketing value-added/specialty products which are unknown to the public can be challenging, and will require consumer education.

There are many types of products that can be defined in either of two levels of processing: primary processed products, and secondary processed products. Primary

processing is basically an intermediate step between the fresh produce and the final retail product. Primary products are the simplest value-added products: produce can be frozen, dried, or made into pulp or syrup. These products are either packaged in retail packs, or held and used throughout the year to make the retail products. Secondary products are the further processed retail products one finds on the shelves of the grocery store.

To help understand the retail products, I've divided them into categories for brief comment.

Teas and Infusions- Black tea can be flavored with fruits and other dried plant parts. Infusions or herbal teas contain fruit and/or other dried plant parts often blended with other herbs or berries.

Perfume- The strong fragrance of some fruits and herbs lends itself to perfume.

Extracts- Aromatics, color, and nutraceutical portions of the produce can be extracted to flavor and color other products or develop nutraceutical products. Scents for soaps, bathing and skin care products, candles, and incense are possible uses.

Baking Ingredients- Purees, sauces, and fruit blends are packaged in appropriate sized containers for industrial, restaurant or bakery, and home use.

Baked Goods- Pie, quiche, cheesecake, tarts, strudel, and filled cookies are just a few of the common baked goods which use fruits and vegetables.

Prepared Fast Food- Frozen dinners or entrees, and food prepared by supermarket take out operations incorporate produce into the menu.

Fresh Frozen- Fresh frozen produce, blended or packed as one type at the retail level can be boxed or bagged with an attractive package. There is potential to market this product in specialty stores in the US.

Canned- Produce can be canned in bottles or metal cans. Bottles are an attractive packaging style for the specialty food market.

Juices- Juices can be made from fresh or frozen fruits. A number of processes are options for manufacturing the product. Level of filtration, pulp content, sugar, acid, flavorings, etc. provide variety. The juice can also be blended with other juices, whey, herbs, etc. to make any number of health drinks. Tetra pack, plastic, bags, and glass are available for individual and family sized portions.

Syrups- Like juices, brands of syrups have their unique characteristics. Sugar content, acidity, addition of flavorings, concentration, etc. are variables.

Vinegar-Vinegar gives cooks yet another unique tool for sauces and dressings. Placed in a fancy bottle, the vinegar is a wonderful gift.

Alcoholic Products- Wine ranging from sweet to dry, sparkling wine, wine coolers, and hard liquors are all possibilities.

Candies and Chocolates- Gel candy, pastilles, hard candies, filled hard candies, and filled chocolate are forms of confections that are common. Liqueur filled chocolate is another possibility.

Dairy Products- Yogurt, keifer, ice cream, whey and juice are all possible to find.

Frozen Sorbetto- Frozen dessert.

Soft Spreads- A variety of spreads with different percentage fruit content, blends of fruit, and firmness are found.

Nutritional Supplements and Nutraceuticals- Wafers made with fruit and herbs, cold and cough drops, and vitamin tablets are possibilities.

Cereals- Cereals blended with dry fruit are popular.

Dried/ Freeze Dried/Dried Powder/Fruit Leather- These products all have use in making dressing, stuffing, chocolate bars, and sauces for meat.

Salad Dressings- Dressings containing dried produce or vinegar are an option.

Flavored Honey- Flavored honeys can be made by blending honey with syrup or powdered fruit.

Once you have a recipe developed, Cornell can assist in commercializing the recipe. You will need to send the recipe to Cornell for assuring the safety of the processing and ingredients. With Cornell's approval, one makes an appointment with NYS Ag and Markets to have the production facility approved, and to get a license. From there one is ready to produce. (***Source**: New York Berry News, Vol. 6, No. 9, November 2007*)

Pricing Power

John Power, Penn State Cooperative Extension

Agricultural marketing activities account for over 17% of the nation"s gross national product and seventy cents of every consumer food dollar goes to cover marketing expenses. Being involved in marketing helps producers decide what to produce and when. Clearly, performing some marketing chores is a possible source of increased revenue.

According to academics, there are nine functions of marketing. Buying, selling, storage, transportation, processing, grades and standards, financing, risk taking and market information. One aspect of marketing that generates many questions is the function of selling. "What should I be pricing my melons at?" is heard on many visits to local farm markets. Looking at the above list - of the nine functions of marketing, only *selling* generates cash. This tells me that price is a significant part of your overall marketing plan.

Cost of production is the academic basis of calculating price. However, pricing must be flexible enough to meet the competition and adjustable enough to changing market conditions. As an integral part of the marketing plan, price must be set to meet the sales and financial goals of the enterprise. Having a clear idea of your marketing objectives and the target market for your products makes selection of a "proper price" easier.

Cost Plus Method Price mark-ups are an area of great confusion. Mark-up should be given as a percent of the selling price. Net profit is greatly affected by calculating your mark-up incorrectly. Cost plus mark-up equals selling price. Here"s an example. Let"s say my marketing plan calls for a gross profit goal of 20%. Let"s say a watermelon costs me $1.00. The proper selling price is $1.25, not $1.20. The cost of $1.00 plus mark-up of $0.25 equals selling price of $1.25. This represents a 20% gross margin on the selling price. A common incorrect method of calculating margin would be to take the cost at $1.00 add 20% and get a selling price of $1.20. The trouble with this incorrect method is when the accounting is done I have received a 16% gross margin, not the 20% called for in my planning.

This cost plus method does not take into consideration the competition. Remember, pricing at the level of the competition reflects the costs and perceptions at other farm markets, not yours. Your price is a result of your costs and the perception of your products by your customers. I suggest to retailers the concept of *value* instead of the concept of price when promoting to customers. Value includes the product itself in all its freshness and nutrition, and adds customer service, convenience and your status as a food expert. At a market some time ago I over heard a conversation between the clerk and a customer. The customer was agitated over the price of cantaloupes and suggested a neighboring market had prices much lower. The clerk never missed a beat with the reply – "Well, we know the value of our cantaloupes; I guess they know the value of theirs."

The Point Is Profit We are trying to maximize total profits, not the profit per unit. Are you willing to take a lower price if you could sell more units? The following table gives you a picture of this game. The first row states that if your margin is 10% and you reduce your price 5%, it will take an increased sales volume of 100% to meet your planned revenue goals.

Current % Profit Margin	Required % Price Reduction	Increase in Sales Volume
10	5	100
15	5	50
15	10	200
20	5	33
20	10	100
25	5	25
25	10	67

An effective pricing strategy depends on four factors.

1) You must know your cost for each product.
2) Possible sales response to price change is vital.
3) What are the costs and prices of the competition?
4) What are the probable responses from the competition to what you do?

Summary Proper pricing is essential to long run business success. Pricing is as much a marketing concern as an accounting one and good pricing is a measure of management effectiveness. Good pricing allows a retail farm market to more easily reach their marketing and financial goals. (***Source****: The Vegetable & Small Fruit Gazette, November 2007*)

Winterizing your Sprayer in the Fall

Helmut Spieser, OMAFRA

Your field sprayer is likely finished its duties for this year. Any problems experienced with your sprayer this past season should be fresh in your mind. Now is the time to check it over completely and order replacement parts allowing your dealer adequate time to get the needed items.

Cleaning, checking and winterizing your sprayer in the fall prepares it for storage and has it almost field ready in the spring. Having your sprayer in top working condition now will save you valuable time in the spring.

Clean the sprayer inside & out
Cleaning a sprayer both inside and outside not only gets rid of accumulated dirt and grime but more importantly, removes as much of the chemical residue from the system as possible.

- Use a pressure washer and detergent to thoroughly wash the outside of the whole sprayer. Be sure to get all tank surfaces, the boom, tires and rims as well as the frame and undercarriage.
- Clean the inside of your spray tank completely using a good tank cleaner.
- Circulate this cleaning solution for ten minutes through the tank wash nozzle(s), if your sprayer is so equipped.
- Look for any leaks in the plumbing system as you are circulating the cleaning solution through the sprayer. Be sure to repair any leaks before the sprayer is parked for the winter.
- Remove and thoroughly clean out the end plugs or end caps on the various boom sections. Rinse with sufficient cleaning solution to remove all product residues.
- Remove all filters, screens, nozzles and diaphragm check valves and wash them in the same cleaning solution. A nozzle tip brush will aid in removing any buildup of material on screens.
- Reinstall all the filters, screens, nozzles and diaphragm check valves.

Plumbing freeze protection
All plumbing components are at risk of severe damage caused by water freezing. This is especially critical for the sprayer pump since it is the most expensive part of the plumbing system. Pumps that are not freeze-protected not only risk frost damage but they can also deteriorate in storage as a result of corrosion.

A 50/50 mixture of a good quality antifreeze and water will protect against frost damage. This antifreeze mixture in the plumbing system will also prevent oxidation from occurring by not allowing air to contact metal surfaces causing rust.

- Mix up 5 gallons of antifreeze and water and pump it through all circuits of your sprayer, especially the agitator circuit. After 10 minutes of circulation through the various plumbing circuits, spray the mixture out through the boom and nozzles.
- You can now shut off your sprayer
- Remove the boom end caps or plugs and allow the liquid to drain out.
- Replace the boom end caps or plugs.

Foam markers
Completely drain the foam marker tank and the solution lines that go out to the boom ends. Use compressed air to blow out any remaining liquid in the foam marker lines. Clean or replace the particle filter in the bottom of the foam solution tank. Now you can fold the booms and put them into the cradles.

Lube and Bolt Check
Once the sprayer is dry, go over the whole sprayer from one end to the other looking for any signs of structural wear. This might show up as signs of movement of frame members or fatigue cracks.

- Any cracks in the frame components or wheel spindles should be repaired immediately.
- Touchup any areas of bare metal to protect against rust.
- Tighten all loose nuts and bolts to recommended torques on structural members.
- Inspect tires for cuts, embedded foreign objects and general tread condition.
- Torque wheel studs to recommended levels.
- Check wheel bearings for adequate grease; repack with grease if necessary.
- Grease and lubricate the whole sprayer as outlined in the operator's manual.

Electronics
Monitors and rate controller consoles are usually mounted inside a tractor cab. These units should be carefully removed and cleaned of any dirt accumulation. Store these units in a cool dry place preferably under cover. Coil the electronics cable that is attached to the sprayer. Use a soft bristle brush to remove any dirt in the cable connector blocks. Apply a thin film of electrical grease on the connector pins to prevent oxidation, which may cause poor contact. Fasten this coiled cable to a structural support of the sprayer to keep it from falling to the ground.

Make a big tag to hang on your sprayer that reads "WINTERIZED".

Store your sprayer in a clean dry building.

(***Source**: Ontario Ministry of Agriculture, Food and Rural Affairs Fact Sheet Series*)

Upcoming Meetings:

Dec. 11-13, 2007 - **New England Vegetable and Fruit Conference**. Manchester NH. See page 1 for more detailed information or go to http://www.nevbc.org/

December 14, 2007 **- Growing and Marketing Greener: Greenhouse Growers and Retailers**. Sturbridge Host Hotel, Sturbridge, MA**.** Topics include organic certification requirements for greenhouse ornamentals, principles of organic growing media and fertilizers for greenhouse production, biocontrol and pesticides for organic greenhouse growers, using biofungicides for diseases in greenhouses, choosing and using biodegradable pots, recycling plastics - film and containers, using biofuels, energy conservation, seasonal thermal storage, solar options and a panel on organic products for retailers. 3 pesticide credits
Sponsored by University of Massachusetts Extension, University of Connecticut Cooperative Extension System and Northeast SARE.
Contact: Tina Smith, UMass Extension 413-545-5306 or tsmith@umext.umass.edu.

Jan 15 – 17, 2008. **NJ Annual Vegetable Meeting** at the Taj Mahal in Atlantic City. For more information contract Mel Henninger at henninger@aesop.rutgers.edu .

Jan. 29-31, 2008. (A berry triple header!)

Mid-Atlantic Fruit and Vegetable Convention, Hershey Lodge and Convention Center, Hershey, PA. For more information Contact William Troxell, 717-694-3596.

Annual meeting of the North American Strawberry Growers Association will be held in conjunction with the Mid Atlantic Fruit and Vegetable Convention (above), and the National American Bramble Growers meeting (below). For more information: see news brief below or contact Kevin Schooley at kconsult@allstream.net or visit www.nasga.org.

NABGA Annual Bramble Conference will be in Hershey, Pennsylvania in association with the Mid-Atlantic Fruit and Vegetable Convention and the North American Strawberry Growers Association. For more information contact: Debby Wechsler, 1138 Rock Rest Rd. Pittsboro, NC 27312**, nabga@mindspring.com .**

Feb 7-9, 2008. **Pennsylvania Association for Sustainable Agriculture (PASA) 17th Annual Farming for the Future Conference**. Penn Stater Conference Center, State College, PA. For more information visit www.pasafarming.org .

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