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ENVIRONMENTAL DATA

This information is intended to be used as a guide for monitoring the developmental stages and planning management strategies of pests in your location. Growing degree day (GDD) and precipitation data was collected for the one-week period, June 13 through June 19, 2002. Soil temperature and phenological indicators were observed on June 19, 2002.

Region/Location	Growing Degree Days		Soil Temp (4" depth)	Accum. Precip
	1 Month Gain	Total		
Cape Cod: Barnstable	75	540	62° F	0.90"
Eastern: Hanson	78	607	62° F	1.00"
Waltham	90	770	62° F	1.10"
Central: Boylston	53	507	55° F	1.23"
Western: Amherst	59	626	60° F	0.85"
Great Barrington	55	615	64° F	1.47"

*(**Source**: UMass Extension Landscape Message #16, June 21, 2002)*

STATE WEATHER SUMMARY For the Week Ending Sunday, June 16, 2002

Prepared by AWIS, Inc. (available at http://www.nass.usda.gov/weather/cpcurr/new-eng-crop-weather)

STATE	AIR TEMPERATURES				PRECIPITATION	
	LO	HI	AVG	DFN	LO	HI
ME	29	85	56	-6	0.10	3.67
NH	24	90	57	-6	0.66	5.65
VT	36	90	59	-4	0.68	5.34
MA	44	91	60	-5	0.50	2.02
RI	48	87	60	-5	0.00	0.61
CT	45	91	63	-3	0.55	1.93

*(**Source**: New England Ag. Statistics Service, Weekly Crop Weather Report, Volume 23, No. 8, June 17, 2002;)*

Strawberries

Growing Your Own (Organic) Strawberry Plugs

Ron Khosla, Huguenot St. Farm, New Paltz, NY farm@flyingbeet.com (845)256-0686

Last year, although we bought 2000 plugs in from Jersey Asparagus Farm, we made another 2500 of our own certified organic Chandler strawberry plugs from runners. The folks at Jersey Asparagus farm were incredibly helpful and generous with advice and warnings about fungal infection (damping off) since we were trying to do it organically, and I think their strict warnings are what saved us. We had a 100% success rate in growing the runners into plantable plugs.

We'll be growing a few thousand extra this year if anyone is interested in purchasing them, but we'd encourage anyone with a timer on their irrigation system to try it yourself! Organically grown transplants are required by the new National Organic Program rules and 'Certified Naturally Grown' rules (a program created as an alternative to the USDA's National Organic Program, intended primarily for small family farms that focus on local distribution systems, see: www.naturallygrown.org).

We started by clipping runners with shears and kept them in the cooler until we could plant them. We used trays with 50 square cells filled with our own sterile potting mix made of peat, vermiculite, lime, and rock phosphate. We added no other nutrients, and we lightly fertilized with organic N only after the plugs were well established. We only put in 25 runners per tray, so they had double the space and double the air flow.

We started out misting them every 15 minutes for 5 minutes at a time, but only until early afternoon, and we adjusted the schedule on cloudy days.

You'll need to see how your misters work and adjust the schedule accordingly. Basically we just kept everything damp. We also drenched everything with Plant Shield (which contains the beneficial fungus Trichoderma) when we started, then twice more several days apart. We left the greenhouse vent fan on all the time to keep air moving through the greenhouse, and we also set up household fans so they were blowing on the flats. The runners sent out roots surprisingly quickly, and the plugs grew fast. After establishment we adjusted the water back as quickly as we could to allow more "drying out" times on the surface of the soil.

We're starting the cuttings this year around July 21 to 25, to plant out on August 15 to 20 in the field. In our first year with this system we never had any signs of fungus developing so we haven't had to come up with a solution to save things if it had. (***Source**: VT Veg and Berry News, July 1, 2002*)

Brambles

Elevate Fungicide Labeled for Use in Bushberries and Caneberries

Annemiek Schilder, Michigan State University

Bushberries (blueberries, gooseberries, currants and huckleberries) and caneberries (red and black raspberries, blackberries and loganberries) have been added to the Elevate 50 WDG fungicide label. Elevate was already labeled for control of Botrytis cinerea in grapes, strawberries, and pistachios; and Monilinia diseases in almonds and stone fruit. The active ingredient in Elevate is fenhexamid, which has a unique chemistry. Elevate is a protectant, reduced-risk fungicide, formulated as a wettable dry granule which makes it easy to use. It provides good control of Botrytis gray mold and in field trials in blueberries also suppressed Phomopsis twig blight and mummy berry.

The application rate of Elevate is 1.5 lbs of product per acre. Begin applications at 10 percent bloom and continue through harvest on a seven-day schedule or when conditions favor disease development. Elevate has a zero-day PHI. Do not apply more than 6 lbs of product per acre per season and avoid making more than two consecutive applications before switching to a fungicide with a different mode of action. Elevate should be alternated or tank-mixed with other registered fungicides, such as Captan, to lower the risk of resistance development. Apply Elevate using ground equipment only and do not apply through any type of irrigation system. Do not replant food crops other than those for which the product is labeled within 30 days following the last application. (***Source**: Michigan Fruit Crop Advisory Team Alert, Vol. 17, No. 11, June 18, 2002*)

Blueberries

Twig Blight Common Sight in Michigan Blueberries

Annemiek Schilder, Michigan State University.

Phomopsis twig blight infections are a common sight now in Michigan blueberries. Jersey is especially susceptible. The disease is caused by Phomopsis vaccinii, a fungus that overwinters in infected canes. In the spring, the spores are rain-splash dispersed from cankers and old twigs to the new twigs. Prolonged wet periods and wounding predispose plants to infection. The symptoms consist of dead flower and fruit clusters and a dark brown, spreading discoloration of the twig tissue. This dark brown lesion can spread an inch per week and will kill any fruit clusters along the length of the lesion. Eventually, the fungus can grow down the twig into cane tissues.

Phomopsis twig blight symptoms are sometimes confused with botrytis blight. Botrytis infections are often characterized by a gray, fuzzy mold on the affected plant part, and there is no dark brown discoloration of the twig. Botrytis can also blight leaves.

Botrytis is favored by cool, wet conditions. This year, phomopsis lesions were seen developing in healthy-looking twigs that were collected from various blueberry fields around the Holland area in March. The twigs were placed in a jar with water on the lab bench. Up to 10 percent of the twigs started to show symptoms after a week. The infections seemed to be originating from fruit buds, which subsequently died, and then spread throughout the entire twig. Eventually the whole twig died. Since similar symptoms appeared in the field in April and early May, much earlier than typical spring infections show up (May/June), it appears that these infections took place last year, possibly during August or September when the new fruit buds formed. Previous research showed that phomopsis can release spores all season, from April to September. The bud infections probably remained dormant in the buds until spring temperatures were conducive to growth of the fungus.

Phomopsis twig blight incidence can be reduced by pruning out and destroying infected canes and twigs, which act as inoculum sources. Captan + Benlate or Ziram + Topsin M are the best fungicide choices for controlling phomopsis twig blight. Other fungicides, such as Bravo and Indar, also provide some control. The critical period for control is between green tip and petal fall. The above observations suggest that protection of blueberry bushes may be needed after harvest as well, especially if there is a lot of rain in late summer. More research is needed to understand this aspect of the disease. (***Source**: Michigan Fruit Crop Advisory Team Alert, Vol. 17, No. 11, June 18, 2002*)

Blueberry Tip Borer

Sonia Schloemann, UMass Extension

Blueberry Tip Borer (*Hendecaneura shawiana*) - In June, before new growth has begun to harden, some blueberry shoots may begin to wilt, arch over, and become discolored, the leaves turning yellowish with red veins and the stems purplish. This injury, which may be mistaken for primary mummyberry infection, is caused by the tip borer. The newly hatched worm, tiny and pink, enters the soft stem and bores channels that may extend for 8 or 10" by autumn and result in the destruction of the stem's fruit-production potential in the following year. Prune out damaged tips as observed and burn infected canes. The standard spray program used for other insect pests normally keeps this pest under control.

Insect Management Strategies for Organic Highbush Blueberries

Dr. Sridhar Polavarapu, Rutgers University

The following is a brief summary of some considerations in managing insect pests for organic blueberries.

1) Follow a regular pruning program to take out old canes. This will remove potential overwintering sites of Putnam Scale and contain scale infestations. Putnam Scale overwinters as adult female under the bark of old canes. Pruning of old canes reduces overwintering population.

2) Practice clean cultivation and suppress weeds in and around blueberry fields. Lack of ground cover (weeds) will preclude the availability of suitable overwintering habitats for a number of pests such as cranberry weevil and plum curculio. Regular discing and cultivation of the space between blueberry rows will not only help suppress weed populations, but will also expose both overwintering and active stages of the pests to their natural enemies and high temperatures during summer.

3) Use pheromone traps to monitor cranberry fruitworm, redbanded leafroller, and obliquebanded leafroller populations. Pheromone traps are useful in timing the approved insecticide applications.

4) Insecticides based on *Bacillus thuringiensis* (Bts) and azadirachtin (neem plant extract) are effective against caterpillar pests. Azadirachtin-based products (e.g., Aza-Direct) are more broadspectrum and are expected to have efficacy against aphids, leafhoppers, thrips, and caterpillar pests. Rotenone is another botanical product that can also be used for managing caterpillar pests and sucking insects.

5) Products containing natural pyrethrum are effective against blueberry maggot, the most important pest of highbush blueberries. However, not all products containing natural pyrethrum are approved for organic growing because of the presence of synergist piperonyl butoxide. Only products that contain natural pyrethrum alone are approved for use.

6) In addition to the use of insecticides such as natural pyrethrum, green or red plastic or wooden spheres (9 cm diameter), coated with bird Tanglefoot, and baited with ammonium carbonate dispensers can be used in trapping blueberry maggot flies. Adult blueberry maggot females require a 10-day preoviposition period to reach ovarian maturity before any eggs can be laid. If these red or green spheres are deployed just around the beginning of the female emergence, adult populations can be significantly reduced prior to the onset of egg laying. Alternatively, baited yellow sticky boards (baited Pherocon AM traps) can also be used for the same purpose; however, research as shown that green or red spheres trap nearly 30% more blueberry maggot flies than yellow sticky boards.

7) Early maturing varieties such as Weymouth, Bluetta, and Earlyblue can nearly escape blueberry maggot infestations. The blueberry maggot flies in New Jersey typically begin laying eggs around 20-22 June. By this date, these early varieties would have been harvested two or more times, significantly escaping infestation.

8) Blueberry scorch and blueberry stunt diseases are caused by blueberry scorch virus and blueberry stunt phytoplasma, respectively. Blueberry scorch is vectored by several species of aphids and blueberry stunt is transmitted by sharpnosed leafhoppers. Effective vector management and aggressive rouging of symptomatic plants are the only viable strategies available to manage these diseases at this time. (***Source**: Blueberry Bulletin, Vol. XVIII, No. 10*)

Where'd my leaves go?

Eric Hanson, Michigan State University

Blueberry bushes in many Michigan fields have not leafed out normally this season. In severe instances, canes with a large load of developing berries are nearly devoid of leaves. Often the oldest canes are most affected and younger canes may leaf out normally. This situation has been observed in other years, but normally just on heavy setting varieties such as Bluecrop. Although the cause(s) of this is not clear, a number of possibilities have been suggested.

Carlos Garcia, Ottawa County Small Fruit Agent, observes that the symptoms in his area are generally confined to Bluecrop and are most acute in frost-damaged fields. He observed damage to vegetative growth following three freeze events in April and early May. In one Bluecrop field, bushes in the lowest areas had no leaves, whereas those on higher (less frosty) areas showed much less injury.

Dave Trinka with MBG-Marketing pointed out that cold weather could potentially affect leaf and shoot development without killing the growing point. Perhaps developing leaves were injured enough to slow or stop growth. Cold soils through May could have contributed to this. A delay in vegetative growth would result in more competition between shoots and developing fruit for carbohydrates. The fruit load in many fields is very large, so competition may also be involved.

Jim Hancock, Horticulture, pointed out another anomaly about this year that may be involved. Across several farms from Berrien to Muskegon Counties, bushes produced 30 to 50 percent more flower buds this year than normal. If a higher percentage of nodes develop into flower buds, fewer are left to produce shoots. Older canes tend to produce shorter shoots with fewer nodes, so more flower bud initiation can result in considerably fewer shoots. Conditions that favor flower bud initiation are adequate rain and an extended, warm fall. The high flower bud set likely contributed to the current situation.

These symptoms appear to be the combined result of cold weather and abundant flower buds. Trimming off some fruiting laterals on affected canes may encourage vegetative growth and maturation of the remaining fruit, but this requires considerable time. Additional fertilizer is unlikely to help the situation. Mark Longstroth, District Fruit Agent, indicated that vegetative growth has progressed recently in some fields, and bushes are expected to leaf out with the return of warmer weather. (***Source**: Michigan Fruit Crop Advisory Team Alert, Vol. 17, No. 11, June 18, 2002*)

Grapes

Integrated Pest Management

Tim Weigle, Cornell University

Now is a real good time to get out and walk your vineyard blocks to see what is developing. I have gotten numerous phone calls, e-mail reports and samples of the following pests (or the pest damage) being found in area vineyards. Much of what is being seen in the vineyard in the way of insect damage is beyond the stage where control measures are useful. Go to http://lenewa.netsync.net/public/update.htm to get more information on a specific pest.

INSECTS

Rose chafer - just starting out, keep an eye out for this pest, especially in lighter, or sandy soils.

Grape leafhoppers - not an epidemic by any means but I have seen feeding on suckers in isolated vineyards. Look before you spray as if they are not there the money you invest in insecticide will be wasted.

Potato Leafhopper - This bright green pest is being found on the undersides of grape leaves. It is still too early to see the cupping and yellowing of the leaf edges from the feeding of this pest but you should be on the lookout as potato leafhopper is capable of doing quite a bit of damage quickly. Especially if a vineyard is next to a freshly cut alfalfa field.

Grape berry moth - we aren't necessarily seeing any, but the immediate post bloom period is the time to apply an insecticide for high and intermediate risk vineyards as determined by the Grape Berry Moth Risk Assessment Protocol.

Banded grape bug - Ted Taft Jr. reports seeing very little of this pest in his travels. This pest should be winding down by now. Start scouting next year at 3 to 5-inch shoot growth.

Grape cane borer - we are starting to see more of this pest in western New York. Too late to do anything about it but a good place to start looking if you are finding round holes in your canes.

Grape cane gall maker - too late to worry about. Scout at 3 to 5-inch shoot growth.

Grape cane girdler - too late to worry about. Scout at 10 to 12-inch shoot growth.

Grape flea beetle larvae - probably not a major concern unless you are in a position where you are trying hard to grow wood on frost and freeze damaged vines.

DISEASES

Phomopsis cane and leaf spot - It is not hard to find on the shoots and foliage. Hopefully you had a good prebloom program on to keep berry infections away during the wet spell we had.

Powdery mildew - Rick Dunst has already found a cluster with powdery mildew infections. I am sure with the difficulty in getting sprays timed due to the weather that we will be seeing more of this in the coming weeks.

Downy mildew - Again, Rick found a foliar infection on Concord in a block that had already received one spray. With the wet weather we had earlier this month and in May it is not surprising. Bryan Hed of the North East Lab has pointed out that Chancellor (an excellent indicator plant for downy) has been showing downy mildew fruit infections for a while now.

Black rot - I haven't really seen any black rot infections but this does not mean they are not out there, I just haven't found them.

Angular leaf scorch - again, this is a disease that we see primarily when the weather is extremely wet. Not much of a problem on Concord or Niagara but can be a concern in some of the hybrids and *V. vinifera*.

With all that we are seeing in the vineyard it should drive home the point that this year is not a good year to skimp on your post bloom spray program, especially if you are looking at a full crop. If you have frost or freeze damage, take the time to do some cluster counts to give you an idea of how much crop is out there. Not only do you not want to lose what crop you have hanging, you also do not want to let disease get out of hand and provide a wealth of over wintering inoculum for next year. (Source: Lake Erie Regional Grape Program Crop Update June 25, 2002)

General

Spray Adjuvants and Foliar Fungicides

John Hartman, University of Kentucky

Spray adjuvants are normally thought of as chemical additives, which are not pesticides, that are designed for pesticide applications primarily to enhance pest management, spray operations, or environmental safety. Adjuvants include surfactants, supplements, detergents, wetting agents, penetrants, oils, crop oils, petroleum oils, vegetable oils, phytoblands, stickers, film foamers, extenders, spreaders, spreader- stickers, deposit builders, binders, thickening agents, film makers, foams, emulsifiers, dispersants, antiflocculants, stabilizing agents, synergists, sequesterents, safeners, coupling agents, co-solvents, compatibility agents, buffering agents, humectants, antifoam agents, modifiers, and all-purpose spray adjuvants. Many of these terms are used interchangeably. For example, wetting agents and spreaders reduce surface tension of the spray on the target surface while stickers, binders, and extenders are adjuvants that allow spray residue to resist wash-off.

It is important to realize that commercial fungicide formulations often contain additives along with the active ingredient to aid in fungicide spread and retention. Some pesticides might serve as adjuvants themselves, because when tank-mixed with a fungicide, they may modify the performance of the spray. For example, when maneb or mancozeb are added to copper sprays, bacterial spot control from copper is enhanced on tomato and pepper. However, maneb or mancozeb are not considered to be adjuvants commercially because they are used primarily as fungicides.

Not all adjuvants are alike. Growers need to consult the fungicide label and the adjuvant label to determine if their fruit disease management program will be enhanced with an adjuvant. Fruit growers are increasingly using dilute horticultural oils not only late in the dormant season but also during the summer to enhance insect management efforts. Some of these oils can affect the performance of fungicides; indeed some oils are mildly fungitoxic.

Enhancement of protectant fungicides is attained primarily by utilizing adjuvants that possess spreading (wetting) and sticking properties. The spreader helps to evenly cover as much of the leaf surface as possible with the spray and the sticker helps to maintain the spray residue on the leaf surface for periods of time. There is some uncertainty on whether or not adjuvants enhance systemic fungicide performance. Growers need to be aware that an adjuvant that increases solubility or penetration of fungicides into the plant might cause phytotocity. Thus, only use adjuvants recommended on the fungicide label.

Considerations for adjuvant use:

- ☑ Many chemicals should perform well by themselves when applied under normal to ideal conditions. Spray adjuvants offer a degree of performance insurance when environmental conditions or application practices are less than ideal.
- ☑ Determine what type of adjuvant, if any, is needed by reading the relevant labels.
- ☑ For many wettable powder fungicides, spray adjuvants possessing spreading and sticking agents will enhance effectiveness to some degree when used at the prescribed rate.
- ☑ Use of adjuvants with spreading or sticking agents in conjunction with flowable fungicide formulations does not appear to be as essential as with the wettable powder formulations. In fact, some flowable fungicide labels clearly discourage use of adjuvants, while others make general statements about adjuvants such as „Add a spreader-sticker spray adjuvant if needed‰ (usually with glossy-leaved crops).
- ☑ Be aware of differences in leaf texture (hairy vs smooth or old vs young) and their effects on adjuvants.
- ☑ Avoid using detergents for spreading agents. Most adjuvants sold on the market are non- ionic, whereas detergents are ionic and are likely to cause or enhance burns on the leaves or fruit. Also, non-ionic adjuvants are less likely to combine with minerals in hard water.
- ☑ With low-volume sprays, spreaders can enhance initial spray coverage. Sticking agents can enhance redistribution of the fungicide on plant tissues. Where small spray droplets are formed by a mist blower, spreader adjuvants may reduce „bounce‰, thereby allowing a greater amount of the fungicide to remain on the plant surface.
- ☑ Silicon-containing adjuvants should not be added to spray mixes on crops where bacterial diseases are likely to be present because they enhance ingress of bacterial cells into leaves. Growers should not expect adjuvants to perform miraculous functions.
- ☑ Adjuvants are not recommended with fungicides such as Bravo Weather Stick or Sulfur.

Some examples of adjuvants (not an inclusive list):

- **R-11 Spreader Activator**: Can be used, for example, with Abound, Benlate, Copper, Mancozeb, Rally, Rovral (also has good sticking properties by itself), Topsin-M, and Ziram.
- **R-56 Spreader Sticker**: Can be used, for example, with Abound, Benlate, Captan (avoid excessive wetting or injury may result), Mancozeb, Rally, Rovral (also has good sticking properties by itself), Topsin-M, and Ziram.
- **Nufilm P or 17 Pinolene Sticker**: Tenacious stickers (i.e., Nufilm) usually are not the adjuvant of choice for systemic products. Milder stickers with good spreading properties (R-56) or spreader activators (R-11) would be

more appropriate choices. Can be used, for example, with Copper, Mancozeb, and Ziram.

- **Sylgard 309 Organosilicone Spreader**: Organosilicones are extremely effective spreading agents. At low rates they are very effective spreaders, while at higher rates they also act as penetrants. Low volume applications may benefit from the use of organosilicones by improving coverage. Can be used, for example, with Abound, Benlate, Captan (avoid excessive wetting or injury may result), Copper, Mancozeb, Rally, Rovral (also has good sticking properties by itself), Sulfur, and Topsin-M. (***Source**: Kentucky Fruit Facts, June 2002 by way of Facts for Fancy Fruit, June 19, 2002*)

Spray Incompatibility: (John Strang University of Kentucky) It has recently come to our attention that there is a compatibility problem between the new insecticide Danitol and the fungicide Ziram. Both of these are labeled for apple, pear, and grape production. We suggest that you avoid mixing these in your spray tanks. We will let you know more about this as we learn more. Many thanks to Bill Jackson, Jackson,s Orchard and John Phillips, UAP Richter for bringing this to our attention. (***Source** Facts for Fancy Fruit 2002-08 June 19, 2002*)

Note on Agri-Mek. Dr. Gerry Ghidiu of Rutgers recently noted that Agri-Mek should not be combined with Bravo Weather-Stik or other fungicide with similar sticker, since it prevents the miticide from penetrating the leaf to provide long-residual control. Agri-Mek can be combined with other fungicides such as Quadris (providing there are no other label restrictions) and is typically used with adjuvants such as Latron B-1956 or 0.25% horticultural oil that do enhance foliar penetration. (***Source**: LI Fruit & Vegetable Update No 14 June 14, 2002*)

Postharvest Handling and Storage of Berries

Dr. Jennifer DeEll, OMAFRA

Berries are very perishable and maintaining fresh quality after harvest depends on proper handling, transportation, and storage.

Maturity and Quality Indices

Harvest date is determined by berry surface color. Most standards require more than ? to ? of the berry surface to be colored, depending on the grade and berry type. All berries should be harvested near ripe, as eating quality does not improve after harvest. Appearance (color, size, shape, and freedom from defects), firmness, flavor (soluble solids, titratable acidity, and flavor volatiles), and nutritional value (vitamin C) are all important quality characteristics. For acceptable flavor, a minimum of 7% soluble solids and/or a maximum of 0.8% titratable acidity are recommended.

Ethylene Production and Responses

Strawberries produce very little ethylene, <0.1 ppm per kg per hour at 20oC. Other berries produce between 0.1 and 1.0 ppm per kg per hour at 20oC. Ethylene does not stimulate the ripening of strawberries, raspberries, and blackberries. Therefore, these berries should be harvested near to full ripe. Blueberries are climacteric fruit and will respond to ethylene. However, blueberries should also be harvested near to full ripe because flavor does not improve after harvest. Removal of ethylene from storage air may reduce disease development in all berries.

Cooling and Storage Conditions

Precooling (rapid removal of field heat) is essential within 1-2 hours of harvest. For example, strawberries maintained at 10oC have about one-third the storage life as those rapidly cooled down to 0oC. Precooling may be accomplished by forcing rapidly moving cold air through stacks of berries (forced-air cooling).

Optimum storage conditions for strawberries (7-10 days), blueberries (2-4 weeks), raspberries and blackberries (2-5 days) are 0oC and 90-95% relative humidity. Cranberries (2-4 months) are chilling sensitive and therefore, should be stored at 3oC. In general, storage-life is very dependent on the handling of berries during and after harvest.

The highest freezing point is -0.8oC for strawberries and blackberries, -0.9oC for cranberries, -1.1oC for raspberries, and -1.3oC for blueberries. Overall, berries with high soluble solids content are less likely to freeze.

Modified atmosphere (MA) packaging for shipment with 15-20% carbon dioxide and 5-10% oxygen reduces the growth of Botrytis cinerea (grey mold rot) and other decay causing organisms. In addition, it reduces the respiration and softening rates of berries, thereby extending postharvest life. Whole pallet covers and consumer packages for containment of the modified atmosphere are commonly used.

Physiological Disorders

Shriveling / Water Loss. Berries are very susceptible to water loss, which results in fruit shriveling and loss of gloss. The maximum permissible amount of water that can be lost (based on weight loss) from raspberries and blackberries before becoming unmarketable is 6%.

MA-Related Disorders. Exposure of berries to <2% oxygen and/or > 25% carbon dioxide can cause off-flavors and brown discoloration, depending on berry and cultivar, duration of exposure, and temperature.

Chilling Injury of Cranberries. Chilling injury can develop in cranberries stored at temperatures below 3oC. Symptoms include dull appearance, rubbery texture, and increased susceptibility to decay.

Disease

Diseases are the greatest cause of postharvest losses in berries. Prompt cooling, storage at the lowest safe temperature, preventing physical injury to the fruit, and shipment under high carbon dioxide (10-15%) are the best methods for disease control. In addition, care should be taken to keep diseased or wounded berries out of packages, as rot can spread from diseased to nearby healthy berries.

Gray mold (Botrytis cinerea) can be a serious problem in berries. This disease can develop during storage if fruit has been contaminated though harvest and handling wounds. Avoiding mechanical injuries and good temperature management are effective control measures. This fungus continues to grow at 0oC, albeit growth is very slow at this temperature.

Rhizopus rot (Rhizopus stolonifer) can also be a problem in berries. This fungus forms a fluffy, black whiskery mold on the fruit surface. Cooling the berries and keeping them below 5oC is very effective against this fungus, since it will not grow at these temperatures.

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6th Annual Pioneer Valley Farm Products Guide Features 140 Local Farms Just Down the Road!

Fans of fresh, local food and farming have reason to celebrate: the 2002 edition of the Pioneer Valley Farm Products Guide is now available. The expanded 12-page Guide, a service of CISA, Community Involved in Sustaining Agriculture, features:

- 140 local farms in Franklin, Hampshire and Hampden Counties,
- an index to local farm products,
- a Pioneer Valley farmers market list,
- an map indicating the general location of all 140 farms,
- announcements of upcoming agricultural festivals and events.

The Guide is distributed through area newspapers, Chambers of Commerce and visitor information centers (see below for the newspaper distribution schedule).

“The 2002 Guide is a great resource for anyone interested in finding the best local food and farm products for their family”î says Mark Lattanzi, Guide Editor. “The Guide captures the amazing diversity and creativity of our local farms.” The types of locally grown farm products range from apples and Asian vegetables to nursery plants, hard cider, farmstead cheese, berries, lumber, maple syrup, honey, sweet corn, vegetables and fiber products.

The Guide will be inserted in the areaís major newspapers on the following schedule:

Copies of the Guide will be available free of charge at area Chambers of Commerce and visitor information centers, local hotels and bed and breakfasts, farmstands, farmers markets and other retail outlets by late-May. Area residents can have a copy mailed to them by sending $1 for postage and handling to CISA, 893 West Street, Amherst MA 01002, ATTN: Farm Guide. An electronic version of the Guide will be available at the CISA web site, www.buylocalfood.com.

The 6th Annual Farm Products Guide was produced with the support of the Massachusetts Department of Food and Agriculture, the Massachusetts Society for Promoting Agriculture, the Hampden County Farm Bureau and the Daily Hampshire Gazette.

CISA is a community organization comprised of farmers, consumers and professionals working together to sustain agriculture and the unique rural character of our communities. CISA is the creator of the “Be a Local Hero, Buy Locally Grown” marketing campaign to promote the purchase of local agricultural products by local consumers. CISA also operates FarmNet, a free information and referral service for farmers

and others with questions about farming and agriculture in western Massachusetts, available toll-free, 1-800-627-3002 or 549-1483.

Massachusetts Berry Notes is a publication of the University of Massachusetts Extension Fruit Program which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements over like products are intended or implied.