The New York Berry News

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What's Inside

CurrEnt News & Events:

January 7, 2003: *New England Fruit Growers Association*. For the first time, this meeting will be associated with the annual Tree Fruit meeting and trade show in Sturbridge, MA. The meeting is sponsored by the NEFGA and the UMass Extension Fruit Program. For info call Dominic Marini at (508) 378-2546.

January 10-11, 2003: *Ontario Berry Growers Association Annual Meeting*, Collingwood, Ontario. Contact Joan Fielden 905-649-2101 or Email ontberries@interhop.net

January 22-25, 2003: *North American Strawberry Growers Association Annual Meeting*, Puerto Vallarta, Mexico. Contact Erin Griebe at 810-229-9407. Email: NASGAHQ@aol.com.

January 29, 2003: *New York State Berry Growers Association Annual Meeting* (in conjunction w/ *NY Farmers Direct Marketing Association*) will be held at Sheraton Inn Conference Center in Saratoga Springs, NY. For more information or for registration materials contact the NY Farmers Direct Marketing Association at 315-475-1101. Or send inquiries to 7350 Collamer Road, East Syracuse, NY 13057.

February 4-6, 2003: *The Mid-Atlantic Fruit & Vegetable Growers Conference.* Hershey Lodge and Convention Center Hershey, Pa. For more information contact Maureen Irvin, (717) 677-4184.

February. 7-8, 2003: *North American Bramble Growers' Association* will meet in Leesburg Virginia. The meeting will be held at the Holiday Inn at the Historic Carradoc Hall. Contact Jason Murray, Commercial Horticulture Agent, for further information, at jamurray@vt.edu or 703-737-8978. You can view the program at http://www.ento.vt.edu/Fruitfiles/NABGAProgram03.pdf

February 18-19, 2003: *The Niagara Peninsula Fruit & Vegetable Growers' Association* and the *Ontario Horticultural Crops Conference* have joined together to bring you the Ontario Fruit & Vegetable Convention (OFVC), Brock University, St Catharines. Theme "Growing Together". Contacts: Chairman: Tony Sgambelluri - 905-945-1713 (Cell 905-651-1264); Vice Chair: Bob Cobbledick - 905-945-9057; Trade Show Chairmen: Ross Parker - 905-562-4136 and Ralph Troup - 905-563-826

USDA Reports Increase in Farmers Markets

The USDA reported in the National Directory of Farmers Markets 2002 that the number of farmers markets in the U.S. continues to increase, with 3,137 farmers markets listed in the 2002 Directory. That number is 274 more than listed in the year 2000 Directory and increase of more than 80 percent since USDA reported in 1994 that there were 1,755 farmers markets. Farmers markets are defined as more than one farmer or vendor using a common facility on a recurring basis with an emphasis on the sale of fresh farm products and other locally produced items. USDA gathers information on farmers markets by contacting individual markets along with representatives of the state level farmers market and direct marketing community. An up-to-date listing of farmers markets and related facts can be found at USDA's Farmers Markets Web site: www.ams.usda.gov/farmersmarkets. A print edition of the directory will be available in December and can be requested from the Web site. More information on farmers markets is available by

contacting: Errol R. Bragg, AMS Room 2646S, USDA Stop 0269, 1400 Independence Ave. SW, Washington DC 202500269; phone: 2027208317; fax 202690-0031; or email: <errol.bragg@usda.gov>.

— Strawberry —

If you haven't done so yet, fall herbicide applications should be your top priority. Courtney Weber covered fall weed management in great detail for strawberry and raspberry, and Caleb Torrice for blueberry in September's issue of the NYBN. I have taken excerpts, primarily those sections dealing with herbicide applications, from these articles and reprinted them here.

Fall herbicide applications should wait until the strawberry plants are dormant. This generally means several hard freezes and consistently low temperatures. Herbicide options in the fall include 2,4-D, Devrinol, and Sinbar and all are applied to dormant fields. 2,4-D helps cleanup broadleaf perennials but must not be applied too early as strawberry is a broadleaf perennial and will die if this herbicide is actively taken up.

Devrinol is a good preemergent herbicide and can be applied under the straw for spring weed control. The straw protects this herbicide from being neutralized by sunlight. Sinbar is also an effective preemergent herbicide that can be applied under the straw but is not as persistent and is best applied in the spring after straw removal while plants are still dormant. It needs to be washed into the soil and off the strawberry plants and you must be aware that many strawberry varieties are sensitive to Sinbar.

It is also time to be thinking about applying straw mulch. Strawberries need mulch to survive winter lows, fluctuating temperatures and soil heaving. To apply a 2" to 4" layer of mulch 2.5 to 5 tons (125 to 250 forty pound bales) per acre are required. Clean wheat, oats or rye straw is best but any material that doesn't compact can be used. Mulch is usually put down around Thanksgiving after several freezes in the high 20's F or low 30's F occur during the same week. See Pam Fishers article to get a better understanding of when it is appropriate to apply mulch.

— Raspberry —

Late fall is a good time for herbicide applications in brambles. Casaron is probably the most effective option. However, it is expensive and can be difficult to apply. It is a fine granular formulation and care needs to be taken to ensure even coverage within the row. A Casaron specific spreader or hand spreading on a wind free day is recommended. Application should not be done until daytime temperatures are below 45˚F in late fall or winter. Casaron can be used in conjunction with Devrinol and Princep in late fall or spring to provide very good weed control. Devrinol can be applied in late fall or early spring and needs to be washed in within 24 hours as sunlight will break it down. It is a preemergent herbicide and works on germinating seeds. Princep is effective at a single high rate for quack grass in the fall or the application can be split between the fall and spring at a lower rate for other weeds. Princep should not be used on plantings less than 6 months old, tissue culture plants less than 1 year old, or the variety 'Royalty'. Other herbicides available for fall application are Solicam, Surflan, and Sinbar but are not commonly used due to expense and variety sensitivity.

— Blueberry —

There are two strategies for fall weed control. They should be alternated with each other to prevent the buildup of herbicide resistance in weeds. The first strategy is a mixture of 2.5 lb/A of Princep 80WP plus either (A) 5 lb/A of Surflan, (B) 8 lb/A of Devrinol, (C) 2-4 lb/A of Kerb, or 2 lb/A Sinbar. Surflan is not recommended on high organic matter soils. Kerb is useful for quackgrass control. Solicam is labeled and could technically be a fifth option to mix with Princep but it is expensive and injury is more likely to occur. During the planting year, wait at least until the soil is well settled around the plants before applying herbicides. Devrinol and Surflan are good safe options. Use a low rate of Princep the first year, and don't use any Sinbar.

The second strategy that should be part of your weed control rotation is 100-150 lb/A (1.5-2.25 oz/plant) of Casaron. Casaron is a granular that must be spread evenly. A hand-crank granular spreader works well. DeCran Ag Supplies sells a hand-crank spreaders (508) 295-2731. For larger acreage, perhaps the thing to do is rig up a Gandy-type box on the back of an ATV or tractor. Casaron is expensive and should be applied between October and April; March is best if the snow has melted, the soil isn't frozen and the temperature is below 40 F.

Along with the fall pre-emergent weed control program, a fall touch-up of Roundup is effective if quackgrass, goldenrod or other perennial weeds are a problem. It should be applied when 90% of the leaves are off the blueberry plants, but before the first heavy frost. (*Source:* Blueberry Production Summary, 2002. Oswego County CCE)

For those growers who have recurring problems with mummyberry, a control option at this time of the year would be to cover fallen mummyberries with a 3-4 inch layer of mulch. Burying these mummies disrupts their full development. If mulching is not an option, you may need to wait until spring to rake or disc the soil beneath the bushes to bury mummies.

Strawberry, Raspberry, and Blueberry Cultivar Review

Courtney Weber, Dept. of Horticultural Science, Cornell University, Geneva, NY

The winter months are a good time to review your current small fruit cultivars and to make plans for new plantings. New cultivars are released all the time, and the vast majority of them fail to catch on for various reasons including poor adaptability to diverse growing regions, unforeseen disease or insect susceptibility, or fruit characteristics that are unacceptable to the buying public. The following sections are meant as a guideline for New York and the northeastern U.S. No cultivar will work well in all locations, soil types, and productions systems, but many have proven to useful in many different situations. In addition, many new cultivars show promise and may be suitable for your operation. However, as always, try new cultivars on a limited basis before abandoning cultivars that have proven reliable in your production scheme. This list is by no means complete but should address most situations. For convenience, the standard cultivars are followed by an asterisk (*). The author can be contacted with questions or to discuss other possibilities at caw34@cornell.edu.

Strawberry Cultivars

Strawberries are probably the most variable and temperamental of the small fruits and also probably have the most cultivars to choose from because they are often adapted to a relatively small growing region. June-bearing types are most commonly grown in NY and the NE U.S., but interest is growing in day-neutral types grown on plastic. If you are looking to try a new cultivar check out Darselect or Cabot or if you want to see the latest thing, NY1829 and NYUS304B are available in limited numbers.

Early Season

Earliglow* is still considered the best tasting berry around. Primary berries are large, and attractive and are suitable for retail or wholesale. Berry size drops off quickly after the primary berries and yields are relatively low.

Honeoye* has reigned as the yield king for many years and produces an abundance of large, attractive, firm, berries that are suitable for all markets. Closer to an early mid season, the look of this berry sells it, but taste is the major drawback as it can be tart and can develop disagreeable aftertastes when over ripe or in heavy soils. It is susceptible to red stele disease but is manageable.

Northeaster was billed as a replacement for Earliglow and out performs it in all ways except flavor. Yield is higher and fruit size and attractiveness are equal to Earliglow but the flavor is unusual. The grape Kool-Aid like aftertaste can be a turn off to many customers.

Sable is earlier than Earliglow and is equal or better in flavor. Unfortunately it lacks size and firmness. This cultivar is only suitable for direct retail and u-pick operations. Frost damage can be a problem because the flowers open very early.

Mid Season

Brunswick is a new cultivar out of Nova Scotia that sizes and yields similar to Honeoye. However, it has a squat, round shape and tend to be dark and bruise easily. The flavor is good but can be tart when under ripe.

Cavendish is a high yielding, high quality berry in a good year. However, high temperatures during ripening can cause uneven ripening that can be a real problem.

Darselect is a large fruited, high yielding cultivar. The berries are an attractive bright red with a long conical shape. The flavor is very good. However, it tends to be soft. It is worth a look.

Kent* produces medium sized berries with very good yield, especially in new plantings. Hot weather can cause skin toughness to deteriorated. It is very susceptible to leaf spot and scorch and to angular leaf spot. It is very sensitive to Sinbar herbicide. It does not do well in hot weather.

Mesabi* is a very high yielding berry with large berries and good flavor, but does not store well. It is resistant to red stele and tolerant to leaf diseases and powdery mildew.

NY1829 is an advanced selection from the Cornell program that is available for testing this season. It is an early mid-season type with excellent fruit quality. Berries are bright red and firm but not hard, with excellent eating quality and flavor. Fruit is long round conical with a fancy calyx, which makes them very attractive. Disease and insect resistance is unknown at this stage but no significant problems have been noted to date. I like this one a lot.

Late Season

Allstar* is good yielding, high quality cultivar with good flavor. Unfortunately, the color is pale to orangish and is unacceptable to an uninformed consumer.

Cabot produces impressive berries. Average fruit size is far larger than any cultivar currently available. Primary berries often top 40-50 g. The color can be pale and primary berries are often irregular in shape. Secondary berries do not have this problem. Yields are very good. Resistant to red stele. Definitely worth a look.

Jewel* continues to be the favorite in this season. The high quality berries are large and attractive with good

flavor. Yields are moderate. On a good site, it's hard to beat. It is susceptible to red stele and can have vigor problems in poor sites.

NYUS304B was developed through a joint venture with the USDA breeding program in Beltsville, MD and Cornell University and has parents that are resistant to red stele root rot. The fruit is a round conical shaped with darker red color and good flavor. The flesh is firm with good texture and eating quality. Insect and other disease resistance is unknown at this time but no significant problems have been noted to date. It is available for testing in the coming season. Growers looking for a firm late season berry may want to try this one.

Seneca is probably the firmest cultivar available for the northeast. The fruit is large, bright red and attractive but the flavor is only acceptable. It doe not runner heavily and can be adapted to plasticulture.

Winona has very large berries and average yields but can not compete with Jewel for fruit appearance. It has good vigor though and might be useful where Jewel does poorly.

Day Neutral

Everest is a fairly new cultivar out of the U.K. It has large, firm, bright red berries. It does not runner well and is only suited for plasticulture. Over wintering can be a problem with this one.

Seascape is a day neutral out of California that is seeing some success in the east. The fruit is large and very attractive. It is firm and good quality. It does not runner and is only suited for plasticulture. Over wintering can be a problem with this one.

Tribute and Tristar* have been the standard day neutral cultivars for the northeast for the last 20 years. They are disease resistant, vigorous, and runner enough for matted row production. Both are relatively small fruited and low yielding but off-season fruit may pay off. Of the two, Tribute has better size and Tristar has better flavor.

Raspberry Cultivars

There are a lot of raspberry cultivars out there dating from the 1940's to 2002. They come in summer bearing floricane types and fall bearing primocane types. By planting a series of cultivars, it is now possible to have fruit from mid to late June until frost in much of NY and the northeastern U.S. without much late summer gap. Here are some thoughts on some of the cultivars available.

Early Season

Boyne (sibling to Killarney) plants are spiny and produce many suckers. The fruit ripens early and is small to medium in size and somewhat dark and soft, but it has fair flavor and good freezing quality. It has excellent winter hardiness but is susceptible to anthracnose. It is moderately resistant to late yellow rust and tolerant to Phytophthora root rot and crown gall, but is susceptible to raspberry fireblight. Boyne yields very well and is recommended for colder climates.

Killarney* (sibling of Boyne) has short to medium canes, is spiny, and produces many suckers. It is susceptible to mildew and anthracnose. The fruit ripens early, but after Prelude and Boyne. The fruit is medium-sized but very bright red and may crumble. Flavor and freezing quality are good, but berries may soften in warm weather. This cultivar is very hardy and is recommended for colder climates.

Prelude* is the earliest summer fruiting cultivar available. The fruit is medium sized, round, and firm with good flavor. It shows good field resistant to Phytophthora root rot and has good cold hardiness. A moderate fall crop is large enough to warrant double cropping. It is probably the best early season cultivar available for the northeast.

Mid Season

Canby* canes are tall, nearly spineless, and moderately productive. The fruit ripens mid season, is medium to large in size, firm, and bright red with excellent flavor. It has moderate to poor hardiness, and buds may winter kill in cold climates. It is susceptible to Phytophthora root rot.

Claudia (KCE-1) (Patent pending) is a new cultivar from the Maryland program. It produces stout, upright canes. The fruit is large and conical with good flavor and ripens mid to late season A late fall crop is common. It has acceptable cold hardiness for most areas. This is a new release that is relatively untried, but has performed well in Geneva.

Emily (JAM-1) (Patent pending) is a new cultivar from the Maryland program. It produces large midseason fruit with good yield potential. It is susceptible to Phytophthora root rot and has suspect cold hardiness. This is a new release that is relatively untried and has performed poorly at Geneva.

Esta (GEL-114) (Patent pending) is a new cultivar from the Maryland program. It produces fruit mid to late season that are large and conical with a mild, bland flavor. It is susceptible to Phytophthora root rot and lacks cold hardiness. It is resistant to leaf hoppers. It needs trellising for ease of picking. This is a new release that is relatively untried.

Nova is vigorous and upright with long, fruiting laterals. The canes have very few spines. The fruit ripens in mid season and is medium sized, bright red, firm, and

somewhat acidic in taste. It is considered to have better than average shelf life. The plants are very hardy and appear to resist most common cane diseases, including rust. It will set a late fall crop.

Titan* (Plant patent # 5404) produces large canes with very few spines with suckers that emerge mostly from the crown, so it is slow to spread. It is susceptible to crown gall and Phytophthora root rot but is extremely productive. Fruits ripen mid to late season and are extremely large and dull red, with mild flavor. Berries are difficult to pick unless fully ripe. With only fair hardiness, Titan is for moderate climates. It is resistant to the raspberry aphid vector of mosaic virus complex.

Late Season

Encore* (NY 7) (Plant patent # 11,746) is the latest summer fruiting raspberry available. It produces large, firm, slightly conical berries with very good, sweet flavor. The fruit quality is considered very good. It is tolerant to Phytophthora root rot and has good cold hardiness.

K81-6 produces canes that are medium tall with spines only at the base. The fruit is very large with good flavor that ripens very late summer with average firmness. It is resistant to late yellow rust but is susceptible to leaf curl virus and raspberry fire blight. Hardiness is judged adequate for most areas

Black Raspberries

Bristol is vigorous and high yielding for a black raspberry especially in a newly established planting. The fruit ripens early and is medium to large and firm, with excellent flavor. Bristol is hardy for a black raspberry but should be tested to ensure adequate hardiness. It is susceptible to anthracnose and raspberry mosaic complex but is tolerant to powdery mildew.

Jewel* is vigorous, erect, and productive for a black raspberry. This cultivar appears to be more disease resistant than others and includes resistance to anthracnose. The fruit is firm, glossy, and flavorful and ripens in mid-season. This is a hardy black raspberry cultivar.

Mac Black is new to the scene and has not been tested much. It is a late season black raspberry with medium large berries. It is reported to have good cold hardiness for a black raspberry. Definitely worth a look to extend your black raspberry harvest by 7-10 days.

Purple Raspberries

Brandywine produces canes that are very tall with prominent thorns, and suckers grow only from the crown so the plant will not spread. It is susceptible to crown gall but partially resistant to many other diseases. Fruits ripen later than most red cultivars and are large, dull reddish-purple, and can be quite tart. Berries are best used for processing. This is a high yielding cultivar.

Royalty* (Plant patent # 5405) is considered the best purple raspberry available. The canes are tall and vigorous, with thorns, and are extremely productive. Royalty is immune to the large raspberry aphid, which decreases the probability of mosaic virus infection, but is susceptible to crown gall. Fruits ripen late and are large and reddish-purple to dull purple when fully ripe. Berries tend to be soft but sweet and flavorful when eaten fresh. Excellent for processing. Hardiness is acceptable for northern growing areas.

Fall Bearing

Anne (Plant patent # 10,411) produces large, conic, pale yellow fruit with very good flavor and texture in mid to late season. It produces tall upright canes but does not sucker adequately for good stands. It is susceptible to Phytophthora root rot.

Autumn Bliss is an early ripening raspberry with large, highly flavored fruit. It ripens 10 to 14 days before Heritage. Much of the crop is produced within the first two weeks of harvest, which is an advantage in northern climates. It produces short canes with few spines. The fruit is somewhat dark fruit. It is susceptible to raspberry bushy dwarf virus.

Autumn Britten* (Patent Pending) is early ripening with large, firm, good flavored fruit. It is taller than Autumn Bliss with better fruit quality but slightly lower yields. It is a day or two later than Autumn Bliss.

Caroline* (Plant patent # 10,412) is a large, good flavored, conical fruit. It produces tall upright canes. The short fruiting laterals can be challenging to pick. It has moderate tolerance to Phytophthora root rot.

Goldie and Kiwigold (Plant patent # 11,313) are nearly identical cultivars. They are amber sports of Heritage, similar in all characteristics except fruit color. Fruit blushes pink when fully ripe. Goldie blushes slightly more than Kiwigold.

Heritage* is considered the standard for fall bearing cultivars. These tall, rugged canes have prominent thorns and are very high yielding. The primocane crop ripens relatively late. Fruit is medium-sized and has good color and flavor, firmness, and good freezing quality. It is resistant to most diseases. Due to its late ripening, this cultivar is not recommended for regions with cool summers or a short growing season with frost before September 30.

Josephine (JEF-f1) (Patent pending) is a new cultivar from Maryland. The plants are upright and vigorous. Fruit is large with average flavor that ripens mid season. It is resistant to leaf hopper. This is a new release that is relatively untried.

Polana (Patent pending) is a very early season cultivar that ripens14 days before Heritage. It produces short productive canes with multiple laterals per node. The fruit is medium sized fruit with good flavor. Susceptible to verticillium wilt. It needs extra nitrogen to perform well.

Ruby (Plant patent # 7067) is moderately vigorous with good productivity. The primocane crop ripens slightly ahead of Heritage. The fruit is large with a mild flavor. Ruby is moderately susceptible to Phytophthora root rot. The cultivar is suggested for fresh market or shipping in areas with longer growing seasons. It is susceptible to mosaic virus complex and resistant to late yellow rust and powdery mildew.

Greenhouse Production

Tulameen* has been shown to be superior for greenhouse production. It produces very large fruit, and high yields. The fruit is glossy and firm. It is resistant to aphid vector of mosaic virus complex. Plants are not adequately hardy for field production in the Northeast.

Blueberry Cultivars

While blueberries are not widely grown in NY there are regions with suitable soil and they are more widely grown in other regions in the northeast. They exhibit a wide range of hardiness that must be taken into account when selecting cultivars.

Early Season

Bluetta* is very hardy but has small dark berries that are difficult to machine harvest. The large scar on the berry is also a problem. Suitable for Zones 3-4.

Duke* is considered the best early season cultivar available. The fruit size and quality is very good but the flavor can be bland if picked late. It can be machine harvested. Frost tolerance and winter hardiness is good. Suitable for Zones 5-6.

Early Mid Season

Bluejay has high quality fruit that can be machine harvested but may be less productive than other cultivars. Suitable for Zones 5-6.

Northland*, as the name suggests, is very winter hardy. It is a half-high bush with small, dark, soft fruit. It is productive but requires heavy pruning. Suitable for Zones 3-4.

Patriot is winter hardy but frost sensitive. It is a smaller bush but still productive but must be pruned hard for large fruit. It must be fully ripe for best flavor. A recent disease problem resembling virus infection has taken it off the recommend list.

Spartan produces large, good quality fruit with good flavor. It can be machine harvested, but it needs cross pollination for good yields and can be difficult to grow in some sites. Suitable for Zones 5-6.

Mid Season

Bluecrop* is a commonly planted cultivar in New York. It has good flavor and fruit size and firmness. It has high yield potential. It is hardy in most of NY and can be machine harvested. The canes tend to be weepy. Suitable for Zones 5-6.

Blueray* is also one of the more widely planted cultivars in New York. Fruit size is very good with good flavor and high yield potential. Extra pruning is needed with this spreading bush. Suitable for Zones 5-6.

Chippewa* is a very winter hardy cultivar that is productive with large firm fruit. This half-high bush is relatively new and has not been widely tested. Suitable for Zones 3-4.

Sierra is productive and has large firm berries that can be machine harvested. It is less hardy than other cultivars. Suitable for Zones 5-6.

Toro is a productive cultivar with large fruit that ripen uniformly. The clusters tend to be tight which makes picking harder. The canes tend to be too upright and thick. Competes with Bluecrop, which is probably better. Suitable for Zones 5-6.

Late Season

Brigitta is a large flavorful fruit that stores well. It is vigorous but can be less hardy because it grows late into the fall. Excess nitrogen will make this worse. It is susceptible to phomopsis. Suitable for Zones 5-6.

Elliott* is a very late season berry with very good shelf life, 30-45 days in a Modified Atmosphere. The fruit is large and firm but can be tart. It is a good producer. Suitable for Zones 5-6.

Jersey is an old (1928) cultivar that is adapted to a wide soil range. It has high yields of machine harvested fruit but the berries are small and soft. Suitable for Zones 3-6.

Nelson* is productive with firm, attractive, good flavored that can be machine harvested. The fruit can hang on the bush for extended periods. It is a vigorous, hardy bush with wide soil adaptation. Suitable for Zones 5-6.

Table 1. Summary of the blueberry, strawberry, and raspberry varieties covered in the article. For convenience, the standard cultivars are followed by an asterisk*.

Blueberry			
Early season	*Early-mid*	*Mid season*	*Late season*
Bluetta*	Bluejay	Bluecrop*	Brigitta
Duke*	Northland*	Blueray*	Elliot*
	Patriot	Chippewa*	Jersey
	Spartan	Sierra	Nelson*
		Toro	

Strawberry			
Early season	*Mid season*	*Late season*	*Day neutral*
Earliglow*	Brunswick	Allstar*	Everest
Honeoye*	Cavendish	Cabot	Seascape
Northeaster	Darselect	Jewel*	Tribute*
Sable	Kent*	NYUS304B	Tristar*
	Mesabi*	Seneca	
	NY1829	Winona	

Raspberries							
Early season	*Mid season*	*Late season*	*Black raspberries*	*Purple raspberries*	*Fall bearing raspberries*		*Greenhouse*
Boyne	Canby*	Encore*	Bristol	Brandywine	Anne	Heritage*	Tulameen*
Killarney*	Claudia	K81-6	Jewel*	Royalty*	Autumn Bliss	Josephine	
Prelude*	Emily		Mac Black		Autumn Britten*	Polana	
	Esta				Caroline*	Ruby	
	Nova				Goldie/Kiwigold		
	Titan*						

Cold Acclimation in Strawberries: How Strawberries Get Ready For Winter

Pam Fisher, Berry Crops Specialist, Simcoe, Ontario, Canada

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˚ C or -3˚C. For further acclimation, plants must be subjected to cold temperatures, i.e. days of about 10˚C and nights around 0˚C. Photosynthesis is also required for cold acclimation to occur, so plants which 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 minus 12˚C to minus 14˚C in the crown, but even tissue temperatures of minus 6˚C can lead to reduced leaf number, 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 2-3 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 2-3 days.

Nutrient and water status of strawberry plants also affects cold acclimation. Excess or deficient nitrogen will inhibit acclimation, while optimum levels of phosphorous promote acclimation. Plants acclimated under dry conditions fare better than plants that are not water-stressed. Mulching is also important to prevent cold-temperature injury. Raised beds can be 4-6˚C colder than flat beds, but mulching overcomes most of this negative effect. (Source: The All Ontario Berry Grower, October 2001)

USDA National Organic Standards

Agriculture Secretary Ann M. Veneman, on October 21, launched the implementation of USDA's national organic standards for agricultural products providing consistent labeling on products coast to coast. "Today, when consumers see the USDA national organic seal on products, they will know that the products labeled organic will be consistent across the country," said Veneman. "Organic agriculture is increasing and organic farmers across the country have been looking forward to the release of these regulations with anticipation they will create consumer confidence in their products."

Developed from extensive industry input and hundreds of thousands of public comments, the standards went into effect October 21. As of that date, any organic agricultural product must meet USDA standards in order to be sold as "organic." Along with the national organic standards, USDA developed strict labeling rules to help consumers know the exact organic content of the food they buy. Consumers can tell organically produced food from conventionally produced food by looking at package labels and watching for signs in the supermarket.

"We're very pleased with the work that USDA employees and the Organic Standards Board have done over the years to finalize these regulations," said Veneman. The USDA Organic Seal tells consumers that a product is at least 95 percent organic. Products with 70-95 percent organic ingredients can say so on the label (made with organic fruit, for example), but they can't display the seal.

"The focus on consumer awareness is just beginning," said A.J. Yates, administrator of the USDA Agricultural Marketing Program. "To coincide with implementation of the standards, we have updated our website to make it more user friendly and provide consumer information through a variety of avenues." Consumers can access the information at http://www.ams.usda.gov/nop. In addition, USDA's Foreign Agricultural Service has also upgraded its organic website, http://www.fas.usda.gov/agx/organics/organics, which provides information and resources to organic food and beverage exporters.

Other USDA efforts in the organic arena include an Economic Research Service report released last month, Recent Growth Patterns in the U.S. Organic Foods Market, that indicates that U.S. organic farmland has increased from approximately 1.4 to 2.4 million acres. The report can be accessed at http://www.ers.usda.gov.

USDA is administering a $5 million national cost share program to help defray the costs of certification incurred by organic producers and handlers in all 50 states, the U.S. territories, the District of Columbia, and Puerto Rico. This program expands the original cost share program that covered only producers and included only 15 states. USDA will also set aside $3 million per year for fiscal years 2003 to 2007 to administer competitive research grants, largely through the Cooperative State Research, Education, and Extension Service.

The research will focus on determining desirable traits for organic commodities; identifying marketing and policy constraints on the expansion of organic agriculture; and conducting advanced research on organic farms, including production, marketing and socioeconomic research. The organic industry is growing between 20 and 25 percent annually, and has been for the last several years. U.S. retail sales of organic foods reached approximately $7.8 billion in 2000, with global sales topping $17.5 billion.
(*Source:* http://www.ams.usda.gov/nop via
Jerry Iles, Watershed Management Agent, OSU Extension)

What Went Wrong at Agway

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[*Editor's Note:* The authors have indicated that several individuals at the highest levels of Agway have reviewed and checked the facts of this article. The article is the authors independent analysis of many, but not all of Agway's challenges over the years]

On October 1, 2002 Agway filed for Chapter 11 bankruptcy. Many people are asking what went wrong. This is a hasty attempt by the authors to analyze the situation. We hope that this short article will provide valuable lessons for other cooperatives and organizations.

First, a little history. Agway was formed in 1964, the result of a merger between GLF (Grange League Federation) and Eastern States Farmers' Exchange. A year later the Pennsylvania Farm Bureau Cooperative merged into Agway. The result was a very large agricultural supply and marketing cooperative that covered 13 states, spanning from Maryland to Maine to Eastern Ohio.

We have divided our discussion into historic and recent issues.

Historic Factors

Provide Members A Secure Market: Cooperatives are often formed to provide members a secure source of inputs and markets for their products. However, sometimes this motive can go to extremes. GLF (i.e. Agway), together with other New York agricultural

organizations, provided the leadership in establishing a radio network, Rural Radio Network, in 1946 to serve the radio needs of farmers and rural residents. It was sold in 1959 when it had an accumulated deficit of $970,000 and total debt to GLF (i.e. Agway) of $1.36 million. In 1946 GLF also bought approximately a 40 percent share of Mohawk Airlines, the forerunner of USAirways, in the name of providing air transportation to Upstate New York. In this case, they fortunately saw their investment more than double before it was sold.

Another example was Agway's attempt to provide services to members was its operation, together with Southern States Cooperative, of Texas City Refining. The purpose was to provide members a secure source of petroleum products. This proved extremely advantageous and profitable during the oil shortages of the early 1970's. However, the petroleum market eventually changed and Texas City proved a costly investment. It was sold in 1988 at a loss of $110 million.

In 1961, GLF helped form Curtice-Burns, a vegetable and fruit processing company, headquartered in Rochester, N.Y. Curtice-Burns was a combination of what were at the time two struggling vegetable processing companies. Over the years, the company was very successful, but in 1993 Agway announced that it's controlling interest in Curtice-Burns was up for sale. The sale brought in a solid return, and this was one of the first indications that Agway needed cash to fund its other operations.

Emphasis on Size: In the 1970's and 1980's, Agway was the largest cooperative in the U.S., with sales of over $4.1 billion in 1984. At the time there was an emphasis on cooperative size. Agway being on the Fortune 100 list of U.S. companies was often mentioned in publications and meetings. We believe that any organization that places primary importance on size over profitability can likely run into problems. We would argue that this is a malady that also eventually caused Farmland Industries and Ocean Spray their financial problems.

Ability to Manage Many Types of Businesses: There was a longstanding attitude at Agway, and predecessor organizations, that they could manage any type of business, even when other people could not. Two major examples come to mind in Agway's history. The first was an effort in 1941 to get into the retail food business by starting the Cooperative Producers and Consumers Markets, today a Northeast grocery retail chain called P&C. The purpose was to assist New York farmers market meat from their livestock. Ownership interest in P&C was finally sold in 1961 following several years of unprofitable operations.

A more recent example was the purchase of H.P. Hood, a fluid dairy company, bought in 1980. A driving motivation was to help members of Northeast dairy cooperatives maintain a reliable and stable market for their milk, which was at risk. The fluid milk business has always been very competitive, and operates much differently than an agricultural supply company. Agway had no prior experience running a fluid milk business. In 1995, H.P. Hood was sold due to less than projected returns on their investment and mounting financial losses. Another interesting aspect of this example was that right up to their purchase of H.P. Hood, Agway had a strict policy that they would not become involved in dairy processing.

Corporate Culture: We are sure some readers are already wondering why several of the above examples date back to the 1940's. We firmly believe there is significant historical momentum in all types of organizations. This is often embodied in what today is called "corporate culture". Agway instilled a lot of corporate culture in their directors, management, and employees. In fact, we remember when every Agway meeting or at any meeting that an Agway representative spoke at started with a recitation of the Agway mission. However, many of Agway's old traditions and strategies may have out lived their usefulness or detracted from their willingness to change.

A $25 Equity Investment: To become a member of Agway, all a farmer needed to do was buy one share of common stock for $25. And that is all the investment many members have in the cooperative. We firmly believe there is a strong link between how much money members have at risk in a cooperative, and the interest they take in their cooperative, as well as the success of the organization.

Use Of Tax Paid Retained Earnings: Since equity was not coming from members, Agway used tax paid retained earnings as their primary source of equity. Depending on this source of equity means that a cooperative needs to consistently generate positive Net Income. It is also an expensive source of equity, because corporate taxes must be paid by the cooperative reducing the total funds available to build equity. In addition, when a cooperative becomes dependent on tax paid retained earnings, there is a greater tendency for the cooperative to become "management controlled" rather than "member controlled", given that member equity does not grow and most members have little equity at risk (Anderson, 1987).

Heavy Use of Debt: Agway has always been highly leveraged. If compared to their competitors in almost any business, they would likely be one of the most heavily leveraged companies. During the entire 1984-2002 period Agway's highest Equity to Total Asset ratio was 20.6%. From 1998-2001 Equity to Total Assets averaged 12.6%. Our general rule of thumb is that when equity to total assets drops below 15% an organization is suffering severe financial problems. At one point it time, Agway had a goal of using one-third

bank financing, one-third subordinated debentures and one-third equity, primarily tax paid retained earnings. During the entire 1984- 2002 period, this goal was never achieved.

Subordinated Debt: Most of Agway's debt, especially in latter years, was subordinated debt, also known as "junk bonds" because they are not secured by assets. While the level of the company's subordinated debt has remained relatively level over the past 5 years, operating cash flow to support that debt became inadequate and deteriorated. As of it's bankruptcy filing, the largest single owner of these subordinated debentures was Agway's employees through pension fund and 401-K investments. They total approximately $35 million out a total of $425 million in subordinated debt. Members and public security holders own the remaining amount.

Limited Patronage Refunds: Except for 1987 and 1988, Agway has not paid a patronage refund to members since 1980. The primary reason is that sufficient earnings were not being generated from the patronage business, i.e. their agricultural supply operations. Most of net income came from non-patronage businesses such as petroleum, leasing, insurance and produce distribution.

Excess Capacity: With the largest market share for feed and many other input supplies in the Northeast, Agway has been prone to carrying excess capacity, which is typical of a market leader. At the same time there was a major change in market conditions. In terms of feed, more farmers started mixing their own feed using direct purchased commodities, and moved away from the use of pelletized feed. This meant that many of Agway's feed, and other input supply plants, were operating at significantly less than full capacity. This has a negative impact on per unit costs and can often lead to cut throat price competition.

A Triple Delivery System: For most of it's existence, Agway had a triple delivery system with: 1) Agway Inc. owned corporate stores, 2) independent local cooperative stores, and 3) franchise representative stores. There was a period when Agway tried to convert their corporate stores into representative stores. Then in the early 1990's a decision was made to buy out all the independent local cooperatives to consolidate the delivery system. Financial performance did not improve because market conditions continued to change. Beginning in 1999, Agway sold or closed all its remaining company owned stores and sold their warehouse system to Southern States Cooperative. These moves were made because returns on these assets were chronically inadequate. Today most store customers do not realize that the cooperative no longer owns any assets related to the store distribution system. However, Agway remains a supplier to dealers and retains rights and revenues related to use of the Agway name.

Recent Issues

There are several more recent events that should have signaled red flags to members and others that Agway was experiencing significant financial distress.

Continued and Large Losses: Between 1984 and 2002 Agway had losses in eight out of 19 years. Over that nineteen-year period, total losses exceeded profits by $139.2 million. The largest losses can be attributed to the write-down of major businesses or restructuring activities, i.e. Texas City Refinery (1988), the Customer Driven 1995 repositioning (1992), and disposal of four businesses (2002). Continual restructuring and write-downs can be a sign of a changing marketplace as well as ineffective strategies.

Scaled Back Annual Meeting of Members: Until recently, Agway hosted one of the most impressive annual meetings in the U.S. cooperative community. It was a 2-3 day event with thousands attending, and several big names providing entertainment. The cost must have been enormous. As earnings deteriorated, this meeting format became a luxury the cooperative could no longer afford. Over the past few years the size and scope of annual meetings were significantly scaled back, including when and where it is located. While all members receive a "call to the annual meeting" there is little or no publicity. And, as a result, member participation has dramatically declined.

Business Oriented Directors: In January 2001, Agway changed the way it would nominate and elect directors to the board. One rationale given was to get more "business-oriented" directors on the board. At the same time they downsized the board from 15 to 12 member directors. They adopted a very radical nominating system for cooperatives, which has since been changed slightly. Agway wanted more directors with a "big picture view" and "sound business skills". We completely agreed with their motivation. When they adopted their new nominating and election procedures it resulted in a significant change in directors. We viewed this as a signal that the previous governance system did not provide all the skills set required of a contemporary cooperative board.

Outside Directors: Also in January 2001, the Agway board changed director election policies and brought two non-member professional business people onto the board. We had encouraged such a move for several years and understand their "outside directors" made a significant contribution in many areas, but were not as familiar with the agricultural industry. In June 2002, both outside directors notified the board they were resigning from the board. "In their letters of resignation to the Board, neither (outside director) expressed any disagreement with the Company on any matter relating to the Company's operations, policies or practices" (8-K SEC filing, June 17, 2002). It should be a "red flag"

when two or more directors resign from any organization simultaneously, especially outside directors. Also, there was no press release from Agway announcing their resignation.

Limited Cash Availability: In Agway's 2001 Annual Report, cash and cash equivalent in the current assets section of the balance sheet stood at exactly $0. We understand this happened because it was their practice to "sweep" their cash account daily, applying the proceeds against their lines of credit to reduce interest costs. It is rare to find a company of any type record $0 Cash. It is more common when cash accounts are swept for the funds be carried as cash equivalents, and specifically marketable securities. Certainly this should have been a signal to any member, stockholder or debenture holder that there were cash flow problems.

Raising Cash by Exiting Profitable Businesses: In March 2002, Agway announced it was exiting several businesses. A major one being Telmark, their leasing unit which had been very profitable over the years. Why exit a profitable business? The primary reason is to generate needed cash from selling a business that has built up substantial equity over the years in order to reduce the parent company's debt.

Agway also announced on September 12, 2002, that they were selling their Sunflower plant and business in North Dakota to CHS Cooperative. Management had always indicated that sunflowers had been a profitable business and they were "the largest U.S. processor and a worldwide distributor of sunflower" products. Perhaps, it made less sense to keep this business after Agway exited the retail store system. In their March 2002 announcement of businesses to be sold, the sunflower plant was not included. Again, we saw this as an unplanned attempt to generate cash flow by selling another of their profitable businesses.

Failure to Sell Telmark: The March 2002 announcement to sell four businesses included Telmark, Agway's leasing company. On May 23, 2002 Agway announced "after lengthy negotiations, Agway and a potential buyer were unable to reach final agreement on a sale of Telmark (8-K SEC filing). As reported in a subsequent 8-K SEC filing on June 17, 2002, it became apparent that Agway's immediate liquidity situation would not be corrected without the sale of Telmark. The failure to sell one of a company's most valuable assets, causing it to violate its loan covenants, was another signal of severe financial distress.

Suspension of Debt Repurchases: On June 14, 2002 Agway announced they would no longer repurchase subordinated debt early. Up until that time, while their subordinated securities had due dates of up to15 years, Agway was willing to convert them to cash any time a holder submitted these securities for redemption. As a result, it was a very liquid asset for Agway investors. It should be noted that in their annual reports it has been plainly stated that: "Agway is under no obligation to repurchase such debt when so presented, and may stop or suspend this repurchase practice at any time." This was a preemptive action taken to avoid default with its senior lenders' loan covenants.

Delayed Annual Report and SEC Filing: In past years, Agway always reported their annual Sales and Earnings via a press release in mid-August to early September. This year their annual report was posted via a 10-K filing with the Security and Exchange Commission (SEC) on September 30, 2002, the last possible day for filing if a company's fiscal year ends on June 30.

Summary

The purpose of this article has been to point out issues and events members should be sensitive to concerning the performance of their cooperatives. We have tried to identify several "red flags" to hopefully assist in preventing similar problems in other cooperatives. There were several signs over the years, and of late, that Agway was having significant financial difficulties. Certainly Agway has accomplished much over the years, and many farmers indicate that they regret seeing its presence in the Northeast diminished. One point many farmers do not realize is that Agway remains a major competitive force in input supplies and agricultural products marketing in the Northeast. Put differently, they continue to make inputs Northeast farmers purchase cheaper and commodity prices higher. Unfortunately, these benefits accrue to all farmers and not just those that use Agway.

Agway has achieved several other notable accomplishments. They created and developed Telmark; their profitable leasing subsidiary. Agway Energy Products is a large supplier of fuels to Northeast farms, one of the largest suppliers of fuel oil and propane in the U.S. and also a profitable operation. Their profitable produce distribution system is one of the largest on the Eastern seaboard. While their feed operations have struggled financially they remain the largest animal feed and nutrition company in the Northeast. Hopefully, after exiting several businesses and improving their financial structure, Agway will be a more viable, albeit much smaller, cooperative.

There are no simple, easy answers to the question of what went wrong with a business that ends up in bankruptcy. Determining what went wrong for cooperative businesses must involve all of the key players who have an influence on determining financial success: members, directors, and managers. Members, at times, asked Agway to do too much on their behalf without thoroughly understanding the costs involved. Directors did not always demand profitable results. Members can influence directors to opt for the status

quo rather than making the tough strategic decisions needed to compete in today's marketplace. Managers too often selected, and poorly executed the wrong strategies to achieve profitability. Accelerated change in the structure and fabric of production agriculture in the Northeast over the last 30 years, in some cases "pulled the rug" out from under Agway's plant and store operations. There are a number of lessons to be learned. In the limited time available, we have only been able to identify a few of the issues related to what went wrong at Agway. Further study is needed to conduct a more in depth analysis.

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am,OCTOBER 20th, 2002

	Temperature				Growing Degree Days *(Base 50)*			Precipitation (Inches)			
	High	*Low*	*Avg*	*DFN*[1]	*Week*	*Season*[2]	*DFN*	*Week*	*DFN*	*Season*	*DFN*
Hudson Valley											
Albany	60	29	46	-4	0	2959	466	1.8	1.17	23.67	2.25
Glens Falls	60	22	42	-6	0	2474	330	2	1.37	23.95	2.68
Poughkeepsie	60	30	46	-6	1	2765	129	1.96	1.28	33.44	8.92
Mohawk Valley											
Utica	64	30	46	-4	0	2654	386	2.65	1.95	34.29	8.87
Champlain Valley											
Plattsburg	65	26	44	-4	0	2402	229	2.76	2.2	25.62	4.98
St. Lawrence Valley											
Canton	69	23	43	-4	0	2396	441	2.93	2.23	26.07	3.47
Massena	71	22	43	-4	3	2343	305	2.07	1.45	24.53	3.99
Great Lakes											
Buffalo	63	35	48	-4	6	2925	490	2.13	1.44	21.29	-0.95
Colden	59	30	44	-5	0	2371	412	1.57	0.75	20.81	-5.47
Niagara Falls	62	31	47	-5	5	2885	444	1.64	1.04	19.61	-2.07
Rochester	63	33	48	-3	7	3099	733	1.14	0.62	20.11	1.15
Watertown	65	24	45	-4	3	2454	433	1.46	0.87	20.19	2.08
Central Lakes											
Dansville	59	29	44	-7	0	2700	331	1.33	0.77	21.86	0.99
Geneva	60	34	45	-5	0	2752	413	1.1	0.47	20.17	-0.58
Honeoye	60	28	44	-8	0	2612	138	1.13	0.5	22.89	2.35
Ithaca	59	30	44	-5	0	2559	452	1.66	0.94	27.09	4.53
Penn Yan	61	31	47	-3	3	2979	640	0.95	0.32	18.16	-2.59
Syracuse	65	30	48	-3	6	3099	715	1.6	0.9	26.78	3.19
Warsaw	57	29	41	-6	0	2275	486	1.73	1.03	29.61	5.02
Western Plateau											
Alfred	57	26	42	-7	0	2359	448	1.64	0.95	25.7	2.32
Elmira	61	26	45	-4	2	2711	488	1.2	0.57	23.8	2.84
Franklinville	58	27	43	-4	0	2107	486	1.45	0.64	32.81	7.77
Sinclairville	57	30	43	-6	0	2375	537	2.08	1.19	29.98	1.88
Eastern Plateau											
Binghamton	58	29	43	-6	0	2574	433	2.09	1.46	27.09	4.97
Cobleskille	64	24	43	-6	0	2474	482	2.22	1.58	26.75	2.92
Morrisville	58	28	41	-7	0	2216	327	2.35	1.61	33.34	9.16
Norwich	64	26	43	-5	0	2428	441	2.44	1.74	28.97	5.18
Oneonta	66	28	45	-3	2	2635	813	2	1.26	30.77	5.43
Coastal											
Bridgehampton	67	33	51	-3	18	3024	463	1.91	1.16	28.61	5.25
New York	63	45	55	-3	35	4030	608	0.96	0.31	29.37	5.1

1. *D*eparture *F*rom *N*ormal
2. Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (http://www.nass.usda.gov/ny/), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture. Their cooperation is greatly appreciated.