

Strawberry Varieties: Review and Future Prospects

Dr. Courtney Weber, Associate Professor, Department of Horticultural Sciences, Cornell University, NYSAES, Geneva, NY 14456 caw34@nysaes.cornell.edu.

Strawberries are one of the most variable and temperamental of the fruit crops and the choice of varieties is extensive because individual varieties are often adapted to a relatively small growing region. The most commonly grown varieties in the northeastern U.S. are June-bearing types and many new varieties have been released in recent years. Most varieties have weaknesses so growers are advised to try new ones on a limited scale to determine how they will perform in each situation. As part of the small fruits breeding program at Cornell University, strawberry yield trials are planted to compare older, standard varieties with new releases. Three trials have been performed recently, the first in 2002-04 comparing 10 varieties, the second in 2003-04 comparing 7 varieties and the third in 2004-05 comparing 14 varieties. All of the trials were grown using the perennial matted row growing system (Pritts and Handley, 1988) with an initial plant density of 7,260 plants per acre (18 inches between plants; 48 inch row centers). A summary of the trials follows along with variety descriptions for strawberry varieties commonly grown in the northeastern U.S. A complete report of these trials has been published in various newsletters including the New York Berry News and can be accessed online at <http://www.nysaes.cornell.edu/pp/extension/tfabp/newslett.shtml> (Weber, Courtney. 2007. Strawberry Variety Review: Head to Head Comparisons. New York Berry News. 6(8):14-20.)

The first trial included several newer varieties including 'L'Amour', 'Clancy', 'Sable', 'Darselect', 'Cabot', 'Eros' and 'Brunswick' compared to the standard varieties of 'Earliglow', 'Honeoye' and 'Jewel'. As a whole, 'L'Amour' exhibited the greatest potential of the new varieties in overall performance with good yields (13,300 lb/ac), large fruit (11.7g) with good storage capacity, and high grower ratings for taste and appearance. 'Darselect' and 'Cabot' show good potential with yields topping 20,000 lb/ac in the first season but have some significant drawbacks. 'Darselect' stores poorly and may renovate poorly when water management is not optimal. 'Cabot' often has fruit deformities in the primary berries but makes up for this in total yield. Unfortunately, severe susceptibility to cyclamen mites nearly eliminated the plots by the third season. 'Brunswick' had the highest average yield over three seasons at 19,000lb/ac and was very vigorous but had high cull rates and dark, soft fruit that may not be suitable for many markets. 'Clancy' performed well in the first seasons but crashed due to poor water management at renovation in the third season. The fruit of 'Clancy' is large and stores adequately but may be a bit dark and is not the classic heart shaped berry that is desired. It does have potential as a late season variety because there are fewer options. 'Sable' did not offer any advantages over 'Earliglow' and had softer fruit. 'Eros' only performed adequately in the first season and went down quickly due to poor renovation and cyclamen mite problems. Its fruit quality was also poor being light and not particularly attractive.

The second trial included the new varieties 'Itasca' (MNUS 138) and Ovation as well as 'L'Amour' and 'Clancy' compared to the standards 'Annapolis', 'Jewel' and 'Honeoye'. Overall, yields were much lower in this trial, probably due to a poorer growing site. 'Itasca' performed very well, producing relatively high yields (8,700 lb/ac) of large fruit in the early season. 'Honeoye' and 'Jewel' performed as expected. 'L'Amour' did not perform as well as hoped in the first season but produced more yield in the second season (9,900 lb/ac) than all

varieties except 'Honeoye'. Commercial sources of plant material should even out the performance of 'L'Amour' (Plants for this trial were produced on site which is not ideal.) 'Ovation' performed relatively poorly but was definitely later than all other varieties. It has been reported to perform better in a plasticulture system. The matted row system in general pushes production later into the season (when higher temperatures occur) compared the plasticulture system, which can reduce yields in later varieties in many cases, as seen with 'Ovation' and 'Clancy' in this trial. In this trial, 'Clancy' had the largest average fruit weight over the season at 14.7g followed by 'Itasca' at 13.2g. 'Honeoye' had very good fruit size in 2003 (13.2g), but it dropped off considerably in 2004 to 9.4g. 'L'Amour', 'Annapolis', and 'Jewel' had similar fruit size at about 11.5g on average. 'Ovation' had the smallest fruit in the trial at just over 10g average weight over the seasons.

The third trial had several of the newest varieties to the U.S. including 'Elsanta', 'Evangeline', 'Serenity' and 'Sapphire' as well as 'Cabot' and 'Darselect' compared to varieties with a longer track record such as 'Earliglow', 'Honeoye', 'Raritan', 'Winona', 'Jewel', 'Northeast', 'Kent' and 'Allstar'. 'Elsanta' has been the standard variety in northern Europe for 10 years or more but has just recently been available to U.S. growers. 'Sapphire' and 'Serenity' are the newest varieties out of Ontario, and 'Evangeline' is relatively new from Nova Scotia. 'Serenity' performed very well with the highest yield by far in the first season (19,600 lb/ac) and moderately large fruit (12.2 g). 'Darselect' and 'Honeoye' also had high yields in the first season (approximately 11,000 lb/ac). 'Evangeline' performed the most poorly in both seasons, generally because the majority of its fruit did not reach a commercially acceptable size of 8g. The remaining varieties were spread out in the 6,000 to 9,000 lb/ac range.

The season in 2005 was particularly short and harsh. A late freeze in the third week of May destroyed the entire crop of the early varieties, 'Earliglow', 'Evangeline', 'Honeoye', and 'Northeast'. Their first harvest was below the minimum 8g average size to be considered marketable and so had zero yield. The later maturing varieties performed much better but many of them had reduced yield as well. 'Allstar' (9,000 lb/ac) and 'Darselect' (8,500 lb/ac) were the top producers followed by 'Cabot' (7,800 lb/ac) and 'Serenity' (7,300 lb/ac).

Overall, some newer varieties show very good promise based on the trial data. 'L'Amour' produced moderate and consistent yields and had very high fruit quality. 'Serenity' produced very good yields in the late season, which is a relatively difficult slot to fill. 'Clancy' also shows promise in the late season with very large fruit but may need to be planted at a higher density. A trial in plasticulture may also be warranted. 'Itasca' from Minnesota shows very good promise for the early season with good yields of large good-quality fruit. 'Darselect' also shows good promise with high yields but has some disease susceptibility and storage problems. The standards, 'Earliglow', 'Honeoye' and 'Jewel', performed as expected and will continue to be planted for years to come.

Literature Cited

Pritts, M. and D. Handley (eds.). 1988. Strawberry production guide. N.E. Region. Agric. Eng. Ser. Bul. NRAES-35. Cornell Univ., Ithaca, N.Y.

Variety Descriptions

Early Season

Annapolis (Nova Scotia) is a large fruited early season variety. The fruit is pale red and soft with good flavor. Suitable for local retail. It yields well. It is susceptible to powdery mildew and *Verticillium* wilt.

Earliglow (USDA, MD) is still considered the best tasting berry around. Primary berries are large and attractive and are suitable for retail or wholesale. Berry weight drops off quickly after the primary berries and yields are relatively low. It is susceptible to powdery mildew after harvest.

Evangeline (Nova Scotia) fruit is long conical in shape with a pronounced neck and generally small with low yields. The interior is pale, and it is susceptible to red stele. The fruiting laterals are stiff and upright which keeps the fruit off the ground and clean.

Honeoye (Cornell University, NY) 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.

Itasca (MNUS 138, University of Minnesota) is a cross between Seneca and Allstar. It fruits early to early-midseason in New York. The fruit is larger than that of Annapolis, conic to blunt wedge shaped. Fruit flesh is orange-red with a average to good flavor. Itasca is resistant to five races of red stele, and its foliage is highly resistant to mildew.

Northeaster (USDA, MD) 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 (Nova Scotia) is slightly earlier than Earliglow and is equal or better in flavor. Unfortunately it lacks fruit size and firmness. This variety 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 (Nova Scotia) has fruit weight and yield 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 (Nova Scotia) 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.

Canoga (Cornell University, NY) was reintroduced in 2005 for plasticulture and ribbon row plantings where drip irrigation is practiced. The berries are very large, firm, bright red in color, with a shiny appearance and good flavor. Plants are vigorous and form branch crowns well in plasticulture. Plants do not runner as freely as most varieties.

Chandler (University of California) is a standard southern variety grown for wholesale markets in plasticulture. High yields have been experienced throughout the Carolinas and California. Not well suited for planting north of the mid-Atlantic region due to lack of winter hardiness. Chandler is also susceptible to anthracnose disease.

Darselect (France) is a large fruited, high yielding variety. The berries are attractive and bright red with a long conical shape. The flavor is very good. However, it tends to be soft. It is susceptible to powdery mildew, which can be a problem in areas with morning fog.

Elsanta (Netherlands) is one of the most widely planted varieties in northern Europe. It is June-bearing with high yield potential. Fruit is firm and aromatic. It is susceptible to red stele, anthracnose, and *Verticillium* wilt.

Jewel (Cornell University, NY) 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 or cold sites.

Kent (Nova Scotia) 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.

L'Amour (Cornell University, NY) 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. No significant disease or insect problems have been noted to date.

Mesabi (University of Minnesota) 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.

Raritan (Rutgers University, NJ) is productive with the fine taste of an heirloom strawberry. Raritan is very flavorful. Its small, deep-red berries are easy to pick. Plants are susceptible to a wide range of diseases.

Sapphire (University of Guelph, Ontario) is a late mid season variety with bright red and large berries. It is reported to be tolerant of the herbicide Sinbar (terbacil).

Late Season

Allstar (USDA, MD) is good yielding, high quality variety with good flavor. Unfortunately, the color is pale to orangish and is unacceptable to an uninformed consumer.

Cabot (Nova Scotia) produces impressive berries. Average fruit weight is larger than any variety currently available. Primary berries often top 40-50 g. The color can be pale throughout the berry and primary berries are often irregular in shape. Yields are very high. It is resistant to red stele but is susceptible to virus infection and cyclamen mites.

Clancy (Cornell University, NY) was developed through a joint venture with the USDA breeding program in Beltsville, MD. Its parents were resistant to red stele root rot. The fruit is a round conical shaped with darker red color and good flavor. The flesh is very firm with good texture and eating quality. The fruiting laterals are strong and stiff, keeping the fruit off the ground until they reach full size. No significant disease or insect problems have been noted to date.

Eros (Italy) is a light colored late season variety with large but somewhat squat berries that are not particularly attractive. Yields are adequate in good stands but it does not renovate exceptionally well. It is susceptible to cyclamen mites.

Ovation (USDA, MD) is extremely late. It doesn't flower until after most others are past their peak bloom. Fruit quality is average but there is little to compare it to in its season. Yields are moderate.

Seneca (Cornell University, NY) is probably the firmest variety available for the east. The fruit is large, bright red and attractive but the flavor is only average. It does not runner heavily and can be adapted to plasticulture.

Serenity (University of Guelph, Ontario) is a late season variety that is also tolerant to Sinbar (terbacil). The fruit is large and bright red. The skin tends to be soft. It reported to be moderately resistant to scorch and mildew.

Winona (University of Minnesota) 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 (Great Britain) is a fairly new variety that 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 (University of California) is a day neutral 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** (USDA, MD) have been the standard day neutral varieties 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.

New Varieties-these have not been tested in Geneva but may be of interest.

Saint-Pierre (Quebec) has large conic shaped fruit that are pale red to orangish, much like Allstar. Fruit firmness and flavor are reported to be very good.

Bish (North Carolina State University) is large and firm. It is resistant to anthracnose. It is a June-bearing variety developed for use in plasticulture systems.

Avalon (Rutgers University, NJ) is an early season berry with large fruit size. The fruit is rounder than Earliglow and somewhat dark. Flavor and firmness are very good. Plants are large and vigorous.