

# Apple Varieties With a Future

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Presented at the 46th Annual IDFTA Conference, February 17-19, 2003, Syracuse, New York

**D**uring the past 20 years there has been a major shift in the varieties of apples that are being planted. Production prior to this was dominated by a few varieties such as Delicious, Golden Delicious and McIntosh which accounted for over 75% of the production in the United States (Miller, 1991). Granny Smith was introduced from Australia, and it became the first new apple introduction to make a major impact. Subsequently Gala and Fuji were introduced and planted in large numbers. Their success was based upon improved taste and quality and consumer acceptance of these better varieties (Greene and Autio, 1990; Stebbins et al., 1991). Growers enthusiastically accepted new varieties and planted them in large numbers since the prices they received for them were considerably higher than for the traditional varieties (Greene, 1998).

Generally the large premium paid for new and better tasting varieties lasts for just a few years, and a premium is paid for only a selected few that are recognized as being superior. Therefore, growers must identify superior varieties early and avoid selecting and planting of varieties that may not become popular.

Aggressive apple variety evaluation programs developed in several areas in response to the developing interest in apple varieties. Programs were initiated by Dr. Robert Norton in Washington State (Norton, 1997) and Dr. Robert Stebbins in Oregon (Stebbins et al., 1995). James Ballard organized the Pacific Northwest Fruit Testers' Association and published results of tester comments in newsletters and annual reports (Ballard, 2002). The results of these programs were most useful to growers in a somewhat limited geographical area. Apple cultivar trials are rarely coordinated across broad geographic regions. Consequently, data cannot be compared because of differences in planting date, rootstocks and data selected to be collected.

In 1995 the NE-183 Regional Project "Multidisciplinary Evaluation of New Apple Cultivars" was initiated. The major objective of the project was to evaluate horticultural qualities and pest susceptibility of new apple cultivars, strains and advanced selections at many locations throughout the United States to determine both the limitations and positive attributes of these cultivars. Cooperators from 18 states and two Canadian provinces established 28 uniform plantings of 22 promising apple cultivars in the spring of 1995.

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Uniform data from all sites were collected for 6 years and the results are now being analyzed, collated and prepared for publication later this year. A second set of 22 apple selections was planted in 29 locations in 20 states and three Canadian provinces in 1999. Preliminary results are being collected from this second planting.

Varieties were arranged into various groups based upon perceived similarity in location and climate. Regardless of the grouping, not all varieties performed in the same way in similar environmental settings. There was a wide variation in response including yield, quality and growth within seemingly similar locations. While regional groupings appear to be useful, it is only one component. We can conclude from this that management is an important component in cultivar performance.

## **CATEGORIZING APPLE VARIETIES** **Outstanding Varieties**

Some varieties have such outstanding qualities that they appeal to a large number of people. They may be so popular that they will be planted extensively and they will be significant nationally and internationally. Newer varieties that fit into this category include Gala, Granny Smith, Braeburn and Fuji. The cultivar in the NE-183 1995 planting that is most likely to fit into this category is Honeycrisp.

**Attributes of Honeycrisp.** It has a pleasant sweet/tart flavor that appeals to a broad group of people. It has explosive crispness and exceptional storage potential. It is the only apple in commercial production today that does not lose firmness in storage and maintains crispness for at least 9 months in regular air storage. It has large fruit size. It is cold hardy down to -25° to -30°F. This is truly an outstanding apple.

**Problems of Honeycrisp.** Honeycrisp does have deficiencies, but the problems are not insurmountable and they can be remedied. Leaves develop a chlorotic appearance that gives the tree an unthrifty appearance. While the exact cause of this is not known, afflicted trees appear to produce good, high quality fruit. This is not a problem that should deter anyone from planting this cultivar.

Soft scald is one of the most serious problems with Honeycrisp. It appears in storage as large blackish-brown areas on the skin. Afflicted fruit are not saleable. Severity is affected by location grown. The problem is minimized by harvesting early, storage at a temperature near 36°F, and leaving fruit at room temperature for up to 4 days after harvest but before placing in storage. In some years late-harvested fruit develop an "off" flavor that does not dissipate in storage. This can be avoided by harvesting early. Internal browning can develop on the tree and in storage. This malady can also be remedied by early harvest.

Honeycrisp can be biennial, especially when young. Thinning is the best way to counteract this. It is easily thinned, thus carbaryl or carbaryl plus a very small amount of NAA is the best approach. Slightly underthinning followed by early hand thinning is probably the best crop load management approach.

Honeycrisp is not a high coloring apple. In good Honeycrisp growing areas, acceptable color will generally develop without delaying harvest too long. Honeycrisp is susceptible to bitter pit and cork spot. These calcium-related disorders can be alleviated or eliminated with calcium chloride sprays during the growing season. Excessive nitrogen fertilization also should be avoided. Honeycrisp can develop decay on the tree and develop more decay in storage than most other varieties. A good fungicide program during the growing season plus postharvest dip with calcium chloride dips plus fungicide should be done.

**Postharvest Problems.** Postharvest problems may be the greatest unsolved challenge for Honeycrisp. Because most are sold near harvest, the extent and the magnitude of the problem are largely unknown. As storage time lengthens, incidence of bitter pit and cork spot will undoubtedly increase. While flesh firmness and crispness remain relatively unchanged in storage, taste may deteriorate especially in harvested fruit, and fruit may develop musty off flavors. We predict that

early harvest, preharvest storage treatments and precise storage management will become increasingly important to maintain high quality Honeycrisp after extended storage.

### Good Varieties with a Potential for Significant Planting

A fairly high percentage of the apples in the NE-183 regional project fall into this category. These apples are very good and many have the potential to be planted extensively. They may not be elevated to the outstanding category because they lack “superlatives” or they may have faults that prevent them from achieving such a lofty classification. The registration of 1-MCP for improving storage potential of apples may be a tool that will elevate good apples with storage problems into the outstanding category. At this point it is too early to say which varieties will respond and to what extent their quality is improved.

### Very Early Varieties

**Pristine.** This is a scab-resistant variety from the PRI program and it ripens fully 7 weeks before Delicious. It is medium sized, russet free and has a very attractive glossy yellow skin. Flesh is crisp and juicy, quite acidic, with little perceptible sugar. The skin bruises easily. It has limited storage potential and is included in this list only because it is one of the best very early apple varieties.

### Early Varieties

**Zestar!™.** This is a medium-sized, somewhat attractive apple that was released from the Minnesota breeding program. It has a pinkish red color on up to 50% of the surface. It has a very unique flavor with an excellent sugar-to-acid ratio where both sugars and acids are quite evident. It is precocious and a grower friendly tree. It stores well for several weeks.

**Sansa.** Fruit can be harvested from Sansa starting about 3 weeks before Gala, a variety that it resembles in size, shape, color and taste. When ripe it has an aromatic and tropical fruit taste that is rivaled by few apples. Good light exposure is required to achieve good red color. Fruit will store up to 2 months. It is a moderate to weak growing tree and the leaves have a mottled appearance that is similar to apple mosaic virus.

**Ginger Gold.** This is a medium to large yellow apple that ripens in the same general season as Paulared, Zestar!™ and Sansa. It has very firm, crisp flesh and can be picked over a 2- to 3-week period starting when the skin turns greenish yellow until it matures to a lemon yellow. It loses flesh firmness relatively rapidly in storage, thus its major marketing season is between harvest and the start of Golden Delicious harvest. Trees are vigorous, spreading and productive, although they are very susceptible to mildew.

**Akane.** This is an oblate, medium-sized apple that ripens about 7 to 10 days before Gala. It has a very attractive red color on nearly 90% of its surface. Fruits have a pleasant taste and are highly aromatic when mature. It is a good cooking apple since cooked slices retain integrity and flavor of the apple. It appears to perform well in traditional McIntosh growing areas.

### Midseason Apples

**Arlet** (Swiss Gourmet). Arlet is a red, slightly tart, medium-sized apple that ripens slightly

later than Gala. Quality is considered good. The skin becomes greasy if harvest is delayed. Use of a preharvest drop control compound is appropriate since Arlet is prone to preharvest drop before fruits become fully red. Fruits have a tendency to develop russet, especially at the calyx end, on as much as 25% of the surface. Red color can mask much of the russet if fruits remain on the tree long enough to develop good red color. It stores quite well if it is harvested at an appropriate time.

**Golden Supreme.** This is a medium to large, conic, yellow apple, resembling Golden Delicious but ripening 7 to 10 days earlier. Flesh is creamy yellow, crisp and quite firm. It requires at least two harvests and preharvest drop may be severe if a drop control agent is not used. It stores better than Golden Delicious. It has an upright and spurry growth habit. This is the least precocious selection in the NE-183 planting and it is considered one of the most difficult and least grower friendly trees to grow.

### Late Midseason Varieties

**Creston.** Frequently Creston is compared with Jonagold, a cultivar with which it shares many characteristics including size, color, firmness, time of ripening and quality. Fruits are medium to large, very crisp and juicy, pleasant and refreshing with a good sugar-to-acid ratio. It lacks good red color and can be stored for 3 to 4 months. It is considered an alternative to Jonagold with a different and pleasant taste.

**Hampshire.** This very attractive seedling selection originated in New Hampshire. It has medium sized yet very uniform fruit. It ripens with Delicious with nearly 100% red color. It has white flesh and a good mild flavor. It stores well, especially in CA storage. Hampshire is a grower friendly tree and it is annual.

**NJ 90.** A unique taste characterizes this McIntosh-type apple. It is a medium-sized, extremely attractive apple that has a deep ebony red color that may be masked by a very heavy bloom on the surface of the apple. It does have some preharvest drop tendencies. The skin is quite thick and, when eaten, it appears to be tough.

**Shizuka.** Mutsu and Shizuka have the same parents, Golden Delicious and Indo, and consequently they are very similar apples. Shizuka is an alternative to Mutsu, and under some circumstances it may be a better choice. Shizuka is smaller, it ripens about 5 to 7 days before Mutsu and it is not as susceptible to infection by the bacterial disease blister spot. Its flesh is a little softer than Mutsu and it does not store as well.

### Late Varieties

**Cameo.** This is a chance seedling from Wenatchee, WA, whose qualities were recognized in the late 1980s. It is vigorous and precocious and is relatively easy to manage in the orchard. Fruit is medium-large, conic and red striped, quite uniform. Flavor is sweet-tart and not strong. It stores well for several months in regular air storage. Cameo will appeal to individuals who like the taste of Delicious but are disappointed and disenchanted with the taste of the array of Delicious strain selections currently available.

### Unique Varieties

There are a number of varieties that have good quality, and in addition they are unique and distinctly different. Consumers can easily distinguish these from other varieties based upon size, shape, color or other unique features. Consumers are now looking for different fruits and vegetables that also have good taste. The unique features of these varieties offer growers an unusual opportunity to develop localized niche markets where they can be the “sole source.” Listed are just four examples of different varieties that have the potential in the Northeast for local success.

**Kinsei.** This is a medium-sized variety that originated in Japan from a cross between Golden Delicious and Ralls Janet. It is a yellow, medium-sized fruit with a rather rough and somewhat unattractive appearance. It ripens with Fuji and stores well in regular air storage. The flavor is deep, complex, tropical, with a decided licorice taste and intense aroma. It would appeal to individuals who like intense, aromatic and anise taste, but this may be just a small portion of the apple eating population.

**Shamrock.** This is a cross between Golden Delicious and Spur McIntosh. In McIntosh season it is green and has both the appearance and taste of Granny Smith. There are no apples grown in the northeast United States at that time of year that mimic Granny Smith. When fully mature it develops the flavor of a good McIntosh, just lacking the red color.

**Cripps Pink** (Pink Lady). This is an apple that is gaining popularity, especially when grown in the warmer growing areas. Because it is such a late maturing variety, it is generally not considered a viable option when selecting apple varieties for the Northeast. However, it does develop an excellent and uniquely different iridescent pink-red color in late October and early November. It does ripen based upon starch degradation. It can withstand temperature down to 23°F without loss of firmness and storage potential. Fruits out of storage during the winter remain attractive and have rated high in taste test evaluations.

**Hudson's Golden Gem.** This is a very high quality, completely russeted apple that ripens with Delicious. It has a rich pear-like flavor that is distinctly different from most apples. It is an attractive, grower friendly tree that shows some tolerance to apple scab.

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