Honeycrisp

David Bedford

Horticultural Research Center, University of Minnesota
Excelsior, Minnesota

Presented at the 44th Annual IDFTA Conference, February 17-21, 2001, Grand Rapids, Michigan.

I would first like to give an overview of how Honeycrisp has performed at the University of Minnesota over the past 18 years. The original cross was made in 1960 at the University of Minnesota. Honeycrisp was patented and released in the public in 1991.

Tree Characteristics

Vigor. Low to moderate.

Precocity. Good.

Rootstock. According to site. There does seem to be some interest in slightly larger rootstocks with Honeycrisp in some areas due to its lower vigor.

Bearing Habit. It generally has been annual bearing, although there have been some reports of biennial tendencies with young trees on very dwarfing rootstocks such as M.9.

Fruit Adherence. Usually good but may show some dropping in warmer climates.

Hardiness. USDA Zone 4, (-25° to -30°F).

Virus Status. Virus-free trees available. Original trees contain stem-pitting virus.

Bloom Season. Early midseason. Flowering crabs with good bloom overlap include Indian Summer, Snowdrift and Golden Hornet. Fruiting varieties which appear to be suitable pollinizers include Cortland, Empire, Redfree and Fuji.

Ripening Season. Approximately 1 week after McIntosh. Approximately September 20-25 in Minnesota.

Disease Resistance.

- Scab—Very resistant. Although it would not be classified as scab-immune, it has shown a very high degree of field resistance.
- Fire blight—Has shown good resistance in our plantings. However, there have been reports from other areas indicating serious infections with young, vigorous trees on susceptible rootstock in severe fire blight years.
- Mildew—Susceptible.

Fruit Characteristics

Fruit Color. 60-90% dappled red over yellow in cool climates. May not color as well in warmer climates. Other factors that may affect coloration include nitrogen (avoid excess), sunlight exposure (especially in older trees) and overhead cooling in warmer climates.

Fruit Size. Medium to large, 2 3/4" to 4". Young trees in Washington may produce very large fruit (4"+) in the early cropping years.

Flavor. Well-balanced, sweet/tart. May be mild in warmer climates or if picked early. Some reports of flavor improving in storage.

Texture. Very crisp and juicy. The texture is perhaps the most unique and outstanding feature of this variety. It has been called "explosively crisp." When viewed under an electron microscope the cells of Honeycrisp are twice as large as those of other varieties. Also, when the flesh of Honeycrisp is broken (as in eating), the lines of fracture run through the cells compared to less crisp varieties which fracture between the cells.

Storage. Excellent - 7 months in common storage at 36°F. The storage life of Honeycrisp is perhaps its second most outstanding feature, especially considering its light texture and season of maturity. Preliminary work in controlled atmosphere storage also looks very promising.

Processing Potential. Appears to be good for slicing.

Each grower will have to look at the risks versus the potential benefits of growing Honeycrisp.

Harvest Maturity Guidelines. May be picked over a fairly wide range of maturity. Honeycrisp may be harvested at a more advanced stage of maturity than most other varieties and still retain excellent texture and storage life.

- Starch/Iodine Index: 5.0 to 5.5 (using a 6 point scale).
- Pressure: 15 to 17 lbs.
- Sugar: 12 to 14° Brix.

PROBLEMS AND QUESTIONS

Leaf Mottling

Honeycrisp trees often exhibit a pale mottled coloration on the leaves. This pattern closely resembles the effect of potato leafhopper feeding. Recent work at Cornell University, however, indicates that leafhoppers are probably not responsible for this mottled coloration. Since no other causes for this phenomenon have been identified, it has been hypothesized that this coloration is a physiological trait of the variety. The mottling has not been shown to cause any problems in fruit production although it may become quite pronounced in some cases. It generally has been more common on non-bearing trees.

Striped Versus Blush Coloration

Honeycrisp are generally considered to have blushed red coloration with varying degrees of secondary striping. There does, however, appear to be a certain amount of Honeycrisp fruit which is completely striped and not blushed. The striped fruit is often not as well colored as the blushed fruit although the eating quality is usually unaffected. We are continuing to study this phenomenon but in the meantime we are encouraging nurseries to work toward reducing this variation using budwood selection.

Bitter Pit

Honeycrisp is susceptible to bitter pit occurrence. This trait is most pronounced on young, vigorous trees with a small crop load and large fruit. In our experience, the occurrence of bitter pit is greatly reduced as the trees mature and the crop load increases. Foliar applications of calcium also have proven very effective in preventing bitter pit on Honeycrisp. Avoiding excessive amounts of nitrogen may also help prevent its occurrence.

Soft Scald

Although we have observed soft scald infrequently in our stored Honeycrisp, there have been reports from other areas of more frequent occurrence. We recently have completed 2 years of a national Honeycrisp storage study, involving 5 universities studying this problem.

Of the factors that were studied, storage temperatures showed the most consistent relationship to soft scald. Fruit stored at 32°F developed more soft scald than fruit stored at 36°F. Additional work at Cornell University and the University of Minnesota showed that a warm treatment (50°F for 1 week) before cold storage resulted in the greatest reduction of soft scald although it caused an increase in the incidence of bitter pit. Research is continuing on this subject.

GEOGRAPHICAL ADAPTATION

Honeycrisp grows best in cooler climates. It appears to be well suited to McIntosh production areas and possibly in the better Jonagold regions in the west. In warmer climates color may be limited and other problems such as fruit drop and bitter pit may be more pronounced. Honeycrisp appears to have a more narrow "comfort zone" than some varieties. Areas that appear well suited to growing Honeycrisp include New England, northern New York, northern Michigan, Wisconsin and Minnesota. Other areas will no doubt be added to this list as more information becomes available.

Presently (January 2001) approximately 950,000 Honeycrisp trees have been planted in the U.S. with the largest acreage in Michigan and New York. Honeycrisp is also being grown or tested in Canada, Europe, New Zealand, Australia and South Africa.

NEW VARIETIES— FACTORS TO CONSIDER

The apple industry is presently going through a time of change and new varieties are part of that reassessment. Since there are no "perfect" varieties I would like to suggest a few factors that need to be considered and how Honeycrisp fits into that picture.

- Costs: How difficult are they to produce and market?
- Income: Will the market pay a premium for them?
  Will they be overplanted and therefore lose their price advantage?

HONEYCRISP QUESTIONS AND ANSWERS

- Is Honeycrisp the easiest variety to produce everywhere? No.
- Will consumers pay a premium for it? Yes.
- Will it be overplanted? Unknown, but perhaps not because of geographical limitations.

Each grower will have to look at the risks versus the potential benefits of growing Honeycrisp (or any other new variety) in his area.