Maturity Standards for Asian Pear Harvest?

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As part of a Northeast Regional Asian Pear Variety Trial, established in New Jersey in 2010 at the Rutgers Snyder Farm, Pittstown, NJ, much has been learned to date. Over the past two growing seasons in NJ part of our work has focused on determining how to know when to harvest Asian pears.

Background

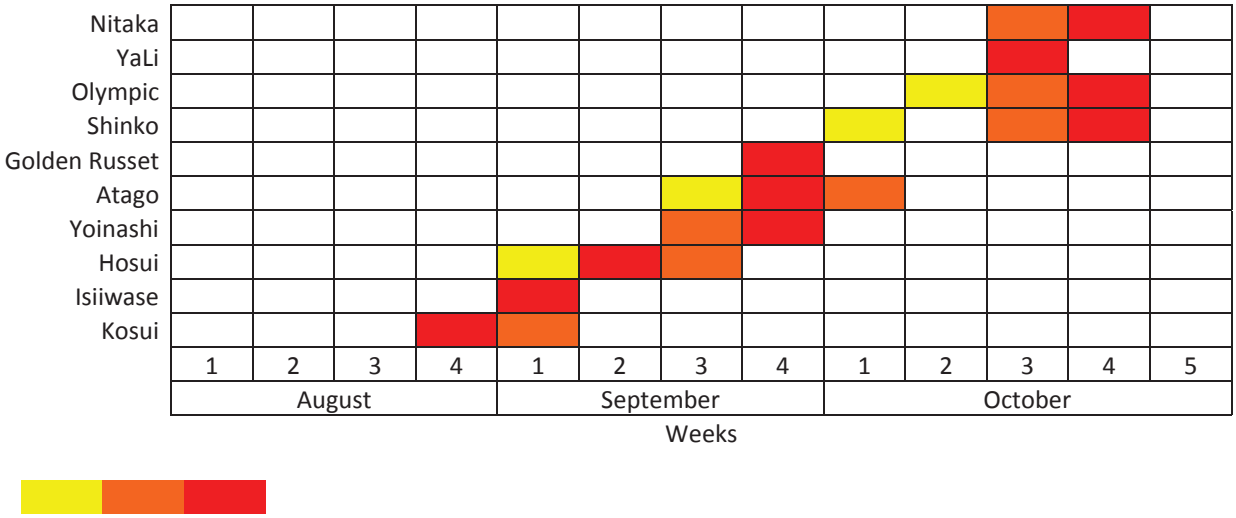
Asian pears are becoming an important commodity for selected growers in NJ. New Jersey has over 200 acres planted with more acreage planned. Contrary to horticultural practices used in growing European pears, Asian pears are more labor-intensive to thin, harvest and transport, therefore commanding an increased commitment and learning curve for the grower, but setting a premium market price. Growers utilizing tailgate markets and pick-your-own marketing have done well attracting the large Asian population in New Jersey as well as educating other consumers about Asian pears to increase their market penetration. Asians make up 8.25% of NJ's population of 8.9 million people.

Our variety trial consists of 10 cultivars of Asian and two European cultivars. With the fireblight-susceptable European cultivars, we should be able to evaluate the Asian pears for fireblight tolerance under NJ growing conditions. Figure 1 lays out the harvest dates of our varieties begging the end of August with Kosui and ending with Nitaka the end of October.

Every grower that produces Asian pears struggles to pick them at the correct maturity.

What we have learned is that you cannot use conventional apple maturity testing on Asian pears. The Starch Iodine test does not work, Brix testing for Soluble solids is not reliable and pressure testing is not very helpful either. Unlike apples, Asian pears do not ripen up in storage so they have to be harvested and stored pretty much tree-ripe. All too often this is not the case and fruit being sold is less than optimal.

Figure 1. 2013 Asian Pear maturity dates, Rutgers Snyder Research and Extension Farm, Pittstown, NJ



Color sequence represents increasing yield at each spot pick, red color equals highest yield.

Maturity Standards

Harvesting tree ripe Asian pears depends on the following factors, both ground and over color, flesh texture and of course taste! One of our goals of this trial is too develop maturity standards for the best cultivars we identify for NJ and develop simple protocols for growers to determine when to harvest their Asian pears for optimum flavor and marketability.

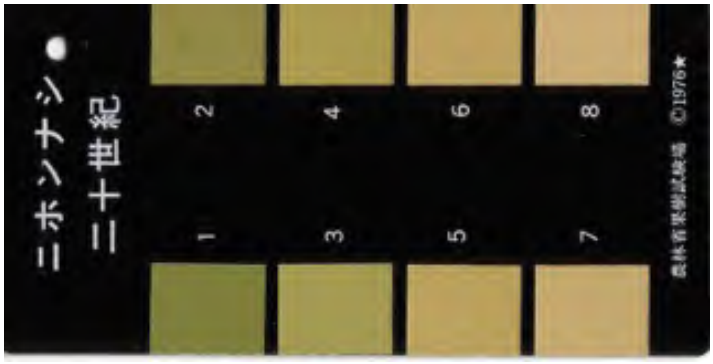


Figure 2. Asian pear ground color chart. Japanese republished by UC Davis.

Note that small fruited Asian pears will not develop the sugars and flavors. Asian pears must be thinned to a single fruit per spur and maybe one every other spur. If crop load is excessive fruit quality will suffer. See the citations below for how to chemically thin Asian pears to remove 50% of the fruit. The rest of thinning must be done by hand clipping.

What we have learned is that you must begin sampling each variety two weeks before anticipated harvest. While each variety will have its own parameters, specifically to color both the back ground color and the over color. It does help if you know what a specific variety and is meant to look like and taste like. The true secret is starting early and then sampling the fruit every 4-5 days.

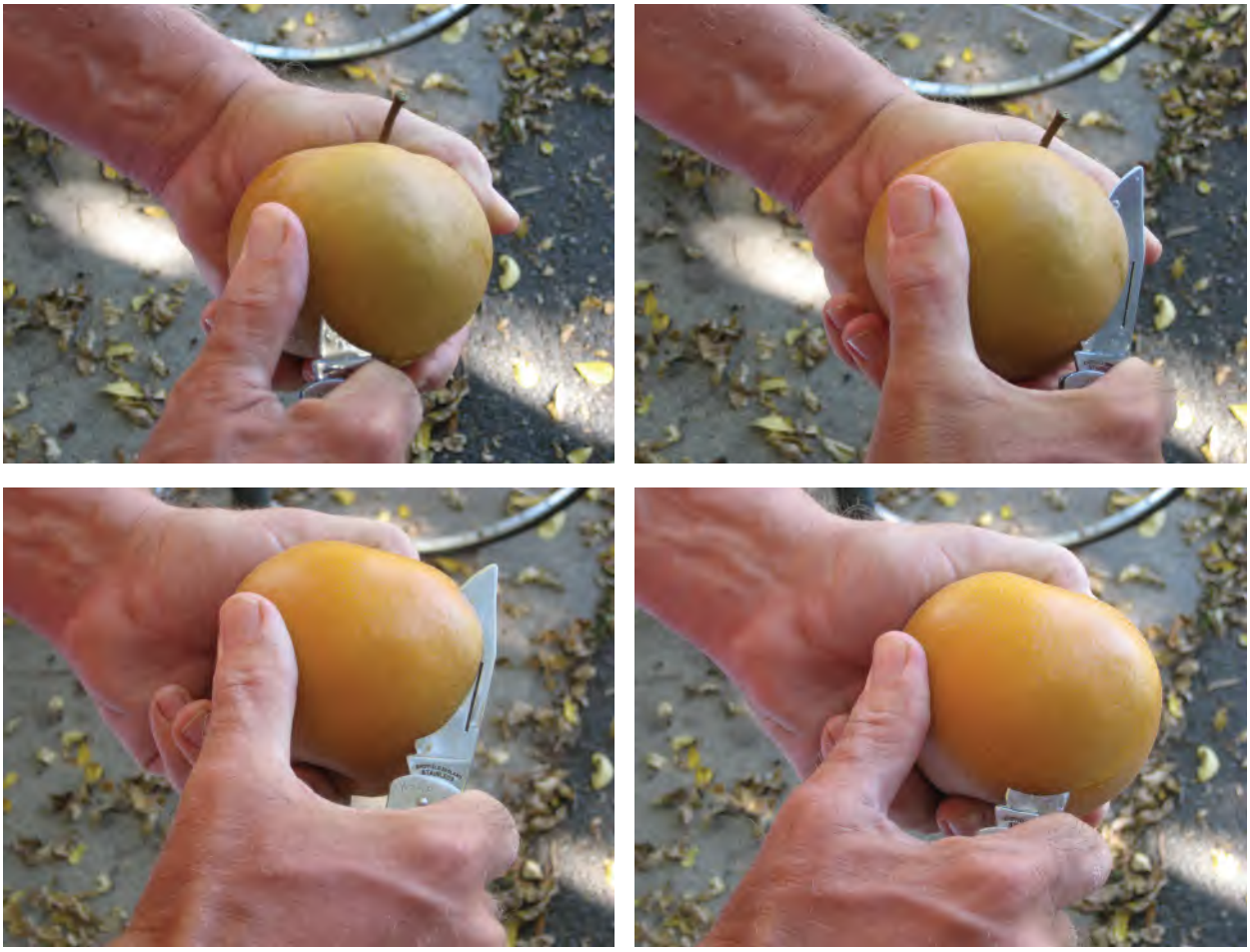


Figure 3. Demonstrating the knife technique: upper photos are of the green side and lower phots are of the sunny side.

You will start to see the back ground color change and the sugars come up as the fruit ripens and gets sweeter. You have to sample fruit for each cultivar from multiple trees to make sure you have a random sample.

In 2012 we started evaluating maturity using the UC Davis Color Chart **(Figure 2)** as a starting point. We attempted to match the ripening pear's background color to the chart. This is an older chart and not all the orange colors were on the chart.

What I found in 2013 was that by starting well ahead of ripening, if you walked the blocks every few days, you could start to see the background color change. As it changed from green to brown or green to yellow (Ya Li) it was easy to see the change.

Individual fruits also ripen on the sunny side of the tree first (south and southwest) and individual fruits will not ripen uniformily, the sunny side can be more mature than the back shaded side. The entire fruit has to begin to change color to be ripe enough to harvest.

For texture and eating quality, you also had to sample the fruit and eat a slice to check for sugar/flavor. Immature fruit will not taste good and will be hard. You have to sample the green side as well to make sure that it is ready. Fruit that has not sufficiently ripened will not have the varietal flavors associated with that pear. It will also be hard and crunchy vs sweet and melting.

We learned one trick/tool for evaluating Asian Pear maturity from an old friend and outstanding Asian Pear Grower, Mr. Ging Lee, Pittstown Fruit Farm, Pittstown, NJ.

Use a sharp knife to slice the flesh of the pear. Bite into a ripe Asian pear and then slice that same pear with a knife (same sharpness) to get the "feel" of what a ripe pear should slice like. When tasting Asian pears, only taste the flesh and not the skin to make sure your evaluating the maturity of the flesh for taste and texture. You will begin to relate maturity and good taste with the flesh texture as measured by the slicing knife. When the Asian pear fruit is totally green (immature), the knife will barely slice the fruit, you have to pull it through. As you try it on a riper fruit, the knife will slice more easily. When fully ripe, it glides right through the fruit. Continue to use the same knife each time you assess field fruit maturity throughout the season. I used this approach extensively in 2013 with great success. The more you use it, the more accurate you will be. You can get to the point where you just slice and you know where you are. See Figure 3 – demonstrating the knife technique.

One of our biggest take away messages from doing detailed maturity sampling was that almost all Asian pear varieties must be harvest multiple times to have mature fruit fit to eat. Most required 3-4 harvests and some 5 harvests. It is also important to note that some cultivars drop permaturely and will require the use of a stop drop (like Retain®).

In Summary

For harvesting Asian pears at optimum maturity you do the following. Begin tracking background color 2 weeks before anticipated harvest. As background color changes color, slice with knife for texture rating and taste the fruit Both green shaded side of fruit and sunny side must be sampled. Utilize as many harvests as necessary (3-5) to only pick mature fruit.

Stop Drop

Note that some Asian pears can drop prematurely. Retain can be used on pears and I know a number of growers.

Citations

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Braching research treatments at Adams County Nursery in Milton Delaware, June 14, 2013 with various plant growth regulators.