Will I Be Able to Plant the Next Great Apple? The New Paradigm in Apple Varieties

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In the 40 plus years since I got my degree in pomology at Cornell I have struggled to maintain the tradition of growing apples in Albany County. In 1935 a survey in the county was conducted and reported that there were 52 farms whose principle source of income was from apples. Barrels of 'Helderberg' apples were still bringing premium prices on the wharves of New York City.

Indian Ladder Farms is now in its 90th year of business and my daughter Laura and I are trying to figure out what to do. We can't find any comfort in the fact that we are one of the two remaining fruit farms left in the county and since we choose to retire the development rights on our farmland instead of installing an 18 hole golf course, our only course of action is to stay in farming. I find that I am not able to sell apples to Wal-Mart or the other big chains. Even with high quality fruit there is no way that I can be the lowest cost producer and make a profit on the traditional apple varieties in the ground. Most of my orchard is planted to yesterday's 'McIntosh' and 'Empire' at wide row spacing, and I can no longer be satisfied with a 500 bu. per acre yield. Thus, we are planning on growing fruit for our friends and neighbors in a sustainable manner. And the most important aspect of being sustainable is to be able to make a living doing it!

The first step is to replant about 5% of the orchard every year. This means no tree is over 20 years in age and there are multiple opportunities to change the "stocks in your portfolio" This way you can stay light on your feet to new technology and market changes.

The second step is to decide what is the apple the consumer will want to buy during the 20 year lifespan of a tree. What characteristics do I need to look for in a new variety?

It needs to be flavorful, crisp and juicy and have an excellent storage and shelf life.

Most of all it must have some aspect that clearly defines it from the rest of the pack.

Apples average 12 to 13 Brix in sweetness. It takes at least a 1% increase to be able to detect a change in sweetness, so to be distinctly different a minimum of 12% to 14% would be required. I understand that new selections can have soluble sugars as high as 19 or 20%.

Hardness and crispness are extremely important components in today's marketplace. Apples coming out of storage need to have a minimum firmness of 13 pounds and several pounds firmer for the future. A new variety must not only have this attribute but also the ability to hold its firmness under a variety of environmental effects such as growing and storage conditions

Acidity is also necessary to provide balance in the taste of apples. 'Honeycrisp' has surprisingly high acidity, which complements its sugar. The trouble is that everyone's perception of acid is different.

Finally there are the issues of aromatics and flavor which will help me make my choice of a new variety to plant.

I am not even going to go into the issues of the tree and whether it will be an early and annual bearer and well adapted to my soil and climate.

Most new apple varieties worldwide are being introduced to growers and the wholesale fruit marketplace as managed clubs. This limits who can grow and sell the variety but may also avoid overproduction and may improve grower returns. The NY fruit industry needs to work with Cornell University to ensure a mutual understanding of how new varieties from Cornell will be introduced.

'Pinova' was a variety that I was watching that had a lot of the characteristics I have mentioned and when they changed the name to 'Corail' I ordered some trees. But the next spring, about the time I was expecting delivery, I was told the variety had been "taken private" by the Stemilt Co. in Washington and trademarked with the name 'Pinata' a my order was cancelled.

Who owns these apple varieties anyway? If they came out of some land grant University don't they belong to the apple growers of that state?

It turns out to be more complicated than that. The plant patent act of 1970 gives plant breeder's intellectual property rights to new plant varieties and in 1980 a Supreme Court decision decided that living things could be patented. Research Universities received and have invested huge amounts of taxpayer dollars in buildings, orchards and people to develop new apple varieties for the public good. Traditionally what was good for the growers was considered the same as the public good. Times have changed and tensions have developed in the system. There has been polarization between the large and small grow-

ers. The top 20% of the growers are large and grow 80% of the apples (although these farms are still family farms). They most likely will be the survivors because they are lowest cost producers. The majority of the growers in the state are smaller and mostly trying to market directly to the consumer with a wide variety of crops and dealing with a public that no longer eats to sustain themselves but eats as a recreational experience. We have become a nation of food grazers! A few large and well capitalized farms have become international and vertically integrated. Can universities justify applied research to these companies? Can they justify receiving research dollars from these companies in the name of the public good? Universities have also broadened and deepened their research agendas, shifting to more basic research, crowding out applied research.

The world has become small with local products on the shelf next to products from any country you can name. The cost of developing a new variety is very high and even with a few thousand dollars invested by the growers themselves, universities find it difficult to compete. New Zealand has the largest and best known breeding program called HortResearch. A new company was formed in 1994 with HortResearch supplying the varieties and "Pipfruit New Zealand", "Apple and Pear Australia", and "Associated International Group of Nurseries", supplying the money. It is called PREVAR and is a multimillion dollar venture covering all facets: breeding, testing of selections, management of intellectual property, marketing and licensing of apple varieties. This is the competition we are up against. What can we expect from our traditional programs?

The University of Minnesota has an outstanding fruit breeding program that developed the 'Honeycrisp' apple and released it to the public domain in the traditional way, and over the last few years they have received royalty payment on a per tree basis. As I understand it, this revenue is about to run out and it appears that taxpayer dollars are going to be decreasing due to budget constraints and other priorities. The plant breeders need money to deliver the next 'Honeycrisp' and it no longer can be done by $1.00 per tree royalties. As a result, the rights to a potentially important variety, currently called Minnesota "1914", have been sold to a private developer for up front dollars that will allow this fine program to continue. In the agreement each Minnesota apple grower will be able to plant a few trees without having to pay for the rights from the private developer.

Most new apple varieties worldwide are being introduced to growers and the wholesale fruit marketplace as managed clubs. This limits who can grow and sell the variety but may also avoid overproduction and may improve grower returns. Many NY growers will not be able to grow some varieties from other areas of the world. However, we have our own apple breeding program at Cornell University led by Dr. Susan Brown.

Let's take a look at our own program at Geneva. In the last 5 years Dr. Susan Brown has planted over 25,000 new seedlings and is collecting data on over 50 acres of orchard. Approximately 326 new selections have been propagated from 66 different crosses. These selections involved over 60 different parents to diversify selections and to develop unique and distinctive apples. In the last three years a

total of 1,150 breeding selection "second test" trees have been planted, with 547 trees planted at 8 grower sites in 2005, another 500+ for this year and 1,500+ available for 2007. Dr. Brown is planning a showcase tasting for this November. This is truly a world class program and I am looking forward to some solutions to my "what to plant" problem.

In April, Cornell and Motts/ Cadbury Schweppes announced an agreement in which Motts will provide the fruit breeding program with some money in each of the next 9 years for the exclusive rights to "processing varieties", in order to ensure access to new varieties and to diversify their mix. The impact of this money should not be detrimental to the fresh fruit program as existing selections that do not make the grade due to appearance or high acidity, etc, will be available and additional crosses probably won't be needed. The money will be used to select existing selections for processing attributes (such as high anti oxidants) and to pay some of the overhead of common data collecting and record keeping as well as some of the common maintenance and spraying. NY 674 is one of the varieties involved and there are issues with some growers who have had the variety on their farm for some years and developed some non processing fresh fruit markets for the apple. What happens to them? The NY fruit industry needs to work with Cornell University to ensure a mutual understanding of how new varieties from Cornell will be introduced.

A few issues that I am thinking about that will require some collective thought by all the growers in the state are as follows:

- We need to identify our elite selections using professional marketers and consumers not just growers.
- We should propagate trees for grower testing. Decide who gets to test, how many trees and how many locations are needed. Also realize we must maintain non-distribution forms and patent status. Codes must be used in testing because disclosure of a breeding number in grower meetings or web sites could start the clock running on the length of patent protection.
- We should realize it is in our best interest in have plant material released to other stations in Europe and South America so if a variety catches on there will be a royalty stream back to our breeding program.
- We should consider an Intellectual Properties agreement between Cornell and the various commodities groups who have made contributions to breeding programs. So that if a major income stream develops everyone knows what is going to happen to the money. Michigan State has worked out such an agreement with their growers. It creates a Commercialization Advisory Group that sets strategies for inventions arising out of mutually funded projects. It recognizes the University owns the patents and gives growers the right of first refusal. This arose when Michigan State sold the rights to some blueberry varieties that they had been working on with growers to a competitor on the west coast.
- Lets keep an eye out for a "world class apple" and have ready a mechanism to have a managed supply where we grow one apple less than the market demands in any given year. Club varieties like 'Pacific Rose', 'Jazz', 'Cameo', 'Pink Lady', and 'Ambrosia', all have different schemes but also have the common themes of managed supply and total control of product quality. A key issue here is to get the variety trademarked. Patents run out, but trademarks last forever if they are properly maintained.
- We need to understand in a managed supply situation, not everyone gets to play and not everyone will get to pack or market. This is fair when you consider that any group that is willing to invest the huge marketing and promotion costs without a guarantee of success and doesn't know when the next great apple comes on the scene, should be the ones who reap the rewards.
- We should bring more money to the table to support our industry. Federal and State funds will be shrinking and we will have to carry more of the burden to get what we want. We have opportunities to get matching money from state programs and the Farm Viability Institute. We are looking at rich and diverse choices of new apple selections but we must invest to maximize the potential reward.
- Finally let's find a way to see to it that every New York grower gets a chance to plant at least some of all New York bred apples. Even if it is restricted to on-farm sales.
- If you have any thoughts or ideas please feel free to contact me via E-Mail at peter@indianladderfarms.com and we can share them.

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