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New Variety Introduction Under U.S. Conditions

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The introduction of new varieties in the United States has been, until the introduction of the 'Pinkerton' and more recently the 'Gwen', hit and miss. The California Avocado Society has for many years maintained a survey of varieties which they opined were "commercially acceptable" or if very new but worth looking at, they were "experimental". This list was last published in the California Avocado Society Yearbook in 1987.

When it was clear that Dr. Bergh's variety development work was going to come up with some outstanding new selections, thought began to be given to what characteristics an acceptable variety needed to have. It is this list that begins the introductory process. Without a variety that is clearly an improvement over what is the current standard, no effort will or should be made to displace the old standard.

These characteristics are of two classes. The first is an economic threshold. Failure to meet this set of tests, no matter how well a variety fulfilled the standard in the second set, would be a non-starter. This first class has four elements:

(1) Significantly higher production capacity. A doubling would be a good starting point;
(2) Regular bearing or only slightly alternate bearing;
(3) Precocious bearing habits with good crops (as much as 11,227 kg/ha) in the third year after planting, or two years after grafting, and
(4) Smaller than average mature tree size. A variety fulfilling these tests assures that its growing economics will result in lower unit costs.

In California, where water, land, and labor are expensive, the discovery of varieties with these characteristics is, in my view, at the very heart of survival of the industry here.

The second class embodies characteristics which make it acceptable to the packer, retailer, and consumer. This last category includes not only the retail customer, but the food service industry and processors. A list of characteristics to be included in this class are:

(1) Eating quality equal or superior to the existing industry standard as to smoothness of flesh texture and richness of flavor;
(2) Ease of peeling;

(3) The ability to endure current packing and transportation practices and arrive at its destination in good condition;
(4) The seed size must be no larger than the current industry standard. A small seed size is a characteristic that is highly marketable;
(5) Its season must be long, no less than six months and preferably longer; and
(6) Postharvest characteristics should be close to those of the standard as to holding temperature, techniques of ripening, and shelf life.

If your candidate variety makes it through all these gates, then there should be a great deal of grower interest in planting or grafting the variety. That is not only as it should be, it is a requirement for successful introduction. This is based on a notion I have borrowed from chemistry, which I have applied to the volume of fruit needed to get the market's attention which I call critical mass.

In America, a new variety needs to quickly reach critical marketing mass. I don't think anyone has made a study of what that number is, but it is derived from the notion that large volume users, our chain stores as an example, simply won't take on an item they can't stock for several months. Short seasons are too much trouble with no offsetting benefits. You may well have a fruit with a physiological tree life of six months or more, but if you only have a couple of million pounds, any attempt to stretch it out will not give you enough volume to get anyone but specialty jobbers to take an interest. Under our conditions, for a variety with six month season to have any impact on the market, it would require about ten million pounds of annual average production. So ten million pounds is my definition of critical mass for the market.

Critical mass is not just a problem for buyers. Packers don't want to fool with a variety that won't give them a reasonable season. They put time and energy into learning the quirks of a variety and to only pack and to sell a few hundred thousand pounds isn't worth investing the energy it takes or the risks of offering something new and untried. But a good variety, offering clear sales points and one which benefits grower economics, should get support and it will if there is enough volume to be worthwhile. Each of you needs to decide what that is for your conditions.

It could very well be that a new variety would make a mark in a. small domestic market with only a million pounds. Once proven in this arena, then this larger export market would open up.

What this means is that a commitment needs to be made to the variety before anything else will make sense. In turn, this means that there needs to be a major effort in your country to make certain that requirements for a new variety are met. All of them. No exceptions. When this is the case, you will have the basis for a grower commitment on a solid foundation of improved economics.

I believe what has been presented so far are the laws of new variety introduction. I am tempted to give these the force of divine law, but lacking either a prophetic call or the position of Moses, I'll settle for saying that if you attempt to introduce a new variety

without being able to say that the candidate variety meets all the conditions, your chances of success are about that of winning the lottery.

What is the next step? The growers must become organized. A solidarity needs to be forged. Yes, forged not simply formed, but hammered out. In two California cases with which I am familiar, two variations on a single theme have been developed. Neither has been proven, in my view, though I have a preference for what the Gwen Growers' Association is doing. This is partly due to material that is present in terms of human resources and partly due to approach.

In the 'Pinkerton' case. Hank Brokaw, as the variety's founder, supporter, and promoter, took a unique stand: "My customers have purchased this new variety from me. I will work with them to see that it is properly introduced to the market." A committee of growers was formed and they set about working with handlers, researchers, and the California Avocado Commission. Initially he financed the effort, but as the job grew, growers were asked for a voluntary assessment. The early response was very high with something around 80% contributing. As early enthusiasm turned to indifference, the percentage dropped, and now is probably about 60%.

The 'Gwen' introduction was initiated with the help of Dr. Bob Bergh. A growers' association was brought into being. It has a board of directors which meets every 60 days and has committees who look after various functions, including membership, processing, marketing, etc. The 'Gwen' growers organized very early in the commercialization phase. Perhaps as a result of this, there was a desire to have a grower's handbook which was produced and updated annually. It is my personal recommendation that every new variety have a handbook. It is an excellent place to have grower questions raised and answered, to talk about postharvest issues, present marketing plans, publish research documents and generally keep all the information about the variety in a single place. In time, it is looked upon as the authority for the variety and can be very helpful in keeping misinformation to a minimum.

I believe variety introduction goes through a sort of biological development. Its first phase is enthusiasm when the idea of a better variety is new and its promise untarnished by inevitable setbacks. The second phase is dealing with problems - real and imagined. The third phase is disappointment which results in some abandonment of plantings. In the fourth phase, a good variety and a dedicated group solve problems, correct false impressions and begin to make progress in the market. That is where the 'Pinkerton' is now.

With 'Pinkerton[1] and 'Gwen', which I have been more or less closely associated, it has been found that each difficulty is magnified out of all proportion to its potential damage to the variety. Problems that are taken as a matter of course with an established variety are represented as fatal flaws in a new one. Growers need to be alert to this natural human tendency and counter it with whatever information is at hand. These problems seem to be both postharvest and horticultural difficulties. In 'Pinkerton', there were genuine problems with the best techniques of pre-ripening and holding temperatures

which needed to be a bit warmer than for 'Hass'. These were addressed with university research to pinpoint the problem and to suggest solutions. With 'Gwen', postharvest problems were a belief that flesh pulled away from skin and caused darkening. 'Gwen' interests zeroed in on the maturity question, and the problem no longer seemed a major one when dry matter minimums were raised.

Season length tends to go through adjustments during early commercialization. For 'Pinkerton', under San Diego conditions, it at first seemed that fruit should be all be off by the end of February. It is now clear that the season can easily extend to mid-April. In the Ventura County growing area, some growers think it can be carried even into June. Early in the life of a variety the season may not be known for all growing areas until the variety has had a chance to come to maturity, often six or seven years after planting. This characteristic can only be dealt with in generalities until the variety is established in all growing areas and there is enough to be able to commercially maintain a season without gaps in supplies.

Introduction of the variety to the market should be undertaken whenever the quantity of fruit is sufficient to do so and need not wait for production to reach critical mass. This will vary with the market and country. Our experience is that growers with some training by packinghouses are excellent spokesmen. It means taking ripe fruit to marketers and explaining its advantages to them instead of to the grower. The fact that a new variety may produce more fruit per acre than the established variety is not a selling point to the marketer. But the fact that a new variety comes in sizes he likes, that it has a long market so he can stay with it, that it maintains its marketable appearance well on retailers shelves, that it will hold well under refrigeration after it has ripened, that it has the flavor his customers prefer; these are the points that impress him. Introduction is done best by growers because they know the variety better than anyone else. Growers have the sound authority and for the best reasons, they have the hands-on experience with it. The problem is to find the right growers who can take time to be trained and can take time to do the work.

Our experience with retailers is that they like to use in-store demonstrations to introduce a new variety. Food service people like to have samples of ripened fruit to experiment with in their kitchens. Literature is important too. In California, we have been fortunate that the California Avocado Commission sees the value of helping worthy new varieties that are undertaking to help themselves and they have produced "sell sheets" for both 'Pinkerton' and 'Gwen'.

A word needs to be said here about the prices growers should expect. The natural tendency for growers of a variety which obeyed all of the eleven laws is to believe that they can walk on water and the market should immediately reflect this with premium prices. Let me immediately disabuse you of that. Not only is it fantasy, its not even good economics. A new variety must prove its way; it must earn its reputation in the market phase. Introduction means introductory prices, which discount the standard variety by 15 to 25%, size for size. If the production capability of the variety is double that of the

standard, a 25% reduction in unit price would mean that the new variety would earn its growers 50% more dollars on the same acreage. No need to be greedy.

Absent good fortune, you may find the growing conditions are not best during each of the introductory years. 'Gwen' has been particularly hard hit by this phenomenon. For two seasons, record hot weather first in May and then in April, caused newly set fruit to drop leaving small crops in both years. The fact that trees had set fruit heavily in both of these years did not keep many growers of the variety from becoming discouraged. Some of them believe that 'Gwen' is more sensitive to heat than other varieties. There have been widespread problems with heavy bloom followed immediately by heavy leaf drop, but as trees grow older this characteristic seems to be lessening as a problem. It was never a major problem on plantings at either U.C. Riverside or the U.C. Research and Extension Center.

Because newer varieties are selected for heavy production, there will be a tendency for leaves to drop if flowering is heavy just as is the case when 'Hass' has a heavy blossom. 'Gwen' growers are beginning to recognize this is a greater problem for them than for 'Hass' growers since 'Gwen' appears to set a heavier bloom every year. As a result they are beginning to spend more time attending to cultural practices that will keep old leaves on longer and start new vegetative growth earlier. Work is being undertaken now to provide greater attention to nutritional needs of the 'Gwen' in the fall so trees have more energy stored in leaves, roots, and wood. Increasing energy banked in the plant during the fall should allow trees to perform better in the spring. Very little attention has been paid to this issue in California.

Why am I going to such length to delve into horticultural issues in a talk on introducing new varieties? Because in one form or another, they are issues that arise in early years and can have a devastating effect on grower attitudes, A good variety will get beyond these problems and what seemed so tragic will look like a dream years later. To take its place in the sun, a new variety must face these issues and be prepared to get through the trial period.

I once thought that a couple of years of introductory effort was all that was needed. Indeed that may be the case if all goes perfectly. My experience is that Murphy's Law will be in play and that anything that can go wrong will go wrong. It will be probable that you will need to prepare for a five year program to introduce your new variety before it gains a firm foothold in the minds of marketers and retailers. Indeed, history of the introduction of 'Hass' took longer than that; a lot longer.

In summary then, what do we have? First, there are eleven characteristics a new variety must have if it is to *be* accepted:

Economic Characteristics

(1) Significantly higher average production capability;
(2) Regular bearing or only slightly alternate bearing;
(3) Precocious in its bearing habits;
(4) Smaller than normal mature tree size;

Fruit Characteristics

(5) Internal eating quality equal or superior to the industry standard;
(6) Superior peeling quality;
(7) The ability to endure current packing practices and arrive at its destination in good condition;
(8) Seed size must be smaller than the current industry standard;
(9) It must have a long season. Six months is the minimum if there is a niche. Longer if not;
(10) There is the need to have an initial planting large enough to allow the crop to reach critical volume even if there is some attrition of acreage along the way; and
(11) Postharvest characteristics should be within or close to the parameters of the current standard, including good shelf life.

Second, you will need to work with your packers and marketers to make them see that support of your variety is in their best interest. Third, you must develop sufficient revenues from growers to finance the introductory process, including visits to retail and other food outlets and printed material. Fourth, introduction is not over after the first year, the second year, or the third year. Some continuing effort is required until the variety has developed a momentum of its own. Some may continue to doubt that a new variety is needed. All history tells you that it will be. Nothing stays static, and the need for better quality and increasing productivity is what civilization is built upon. If attention is not given to this area, someone else will and then we will be playing catch up.