
Breeding History & Variety Selection

Blueberry History and Variety Selection

Introduction

Blueberries have been grown and trialed in the warm climate areas north of Sydney since the late 1970s, when the varieties Sharpeblue and Flordablue were imported into NSW by the Department of Agriculture. At the time there was not the realisation that there is today of the enormous potential to develop such a significant industry based on early fruit production, to the point where today it is estimated that as much as 60% of the blueberries produced in Australia are of the low chill type. Crucial to this growth have been a number of factors including the availability of early fruiting, low chilling varieties from the Southern States of America, the suitable climate of cool winters and warm spring / summer periods, and the availability of suitable soil types.

Window of Opportunity

The key factor in the rapid expansion of the industry in the warm climate areas is the unique "window of opportunity" that exists and is available to blueberry growers in Northern NSW and Southern QLD. Other Southern Hemisphere blueberry producing countries such as Argentina, Chile, South Africa and New Zealand are locked into the production period from mid November through to February, when there is also competition from Southern Australian highbush growers. The industry in the United States commences with fruit from Florida in mid April, producing fresh fruit until the late varieties in Michigan finish about mid September. The production of fresh blueberries in Europe follows a similar pattern, albeit with very little early production.

The unique window of opportunity available to growers in Northern NSW and Southern QLD is to produce fresh fruit from late September through to late November. The good news for these growers is that there are already available to growers some varieties that produce fruit during that period. Exports of blueberries to Europe during that time have not only been well received, but have also been financially rewarding. On the domestic market, prices for the earlier fruit have always been at a premium over the later fruit which not only suffers from competition from overseas and Southern Australian areas, but also from fruits that are in season at the same time.

Variety Selection Criteria

Cold Climate Areas

The highbush industry has had for decades the variety Bluecrop, which has been the industry standard, tried and true, and by which standard all other highbush varieties are judged. The blueberry "enthusiast" might even venture to say that some of its fruiting and eating characteristics are merely average and could be improved upon. Yet, Bluecrop is the most

widely planted variety in the world, and even more importantly, generally makes money for the grower.

The same could well be said for the variety Croatan in North Carolina, where it has remained the backbone of the industry for many years, despite the release of many promising varieties such as O'neal, Wolcott, Bluechip, Harrison, Cape Fear, Bladen and Reveille. "Boring" old Croatan with its average fruit quality, but consistent yielding, is still the variety of choice, decades on and I'm not convinced that it is just a "head in the sand" approach by growers. They know where their bread and butter comes from.

Warm Climate Areas ...

In the warm climate areas of Australia, we too have our bread and butter variety SHARPE BLUE..... the variety which I have said for years must be replaced, but which still remains the first choice of most growers. (I long for the day when Sharpeblue will be a thing that we reminisce about, and I do hope that it will be in my lifetime, or before I retire. This is not because I don't like it's sweet taste, but rather because when I tell the pickers that we will be picking Sharpeblue tomorrow, many of them suddenly develop excuses as to why they can't attend tomorrow).

Why is this so?

The simple answer to this question lies in the fact that there are many criteria that we look at in determining whether a selection has potential to become a mainstream variety, and often a selection that shows early promise because of its fruit characteristics, will end up on the scrap heap due to a failure in bush vigour or disease susceptibility. It is also interesting to note that the variety Brigitta Knoxfield 11A..... was not selected in the original selections of 1974 and 1975, and was an after thought in 1976, due to the fact that its potential as a variety was very slow to become obvious, even though we are aware that today it is being planted in increasing quantities in North America and Europe.

The following are the criteria that I hold as most important in the assessment of new selections and varieties that we are either selecting from seedling crosses or that are imported from the United States (primarily Florida, Mississippi, North Carolina and Georgia).

Bush Characteristics

- BUSH TOUGHNESS / SURVIVABILITY.....

Ever year this factor becomes more important as we look at nice fruit on bushes that subsequently collapse. It is probably the factor that I list as most high in importance.

- BUSH VIGOUR.....

Excessively vigorous bushes, particularly where there is a lot of suckering, or very high shoots, may disqualify themselves, due to being unmanageable, however, bushes that have low vigour are unlikely to produce and sustain heavy yields of quality blueberries.

- BUSH SHAPE.....

Upright well balanced bushes are preferred to low and sprawling types. The cost of pruning sprawling bushes to a round or upright shape, may disqualify them from my selection trials.

- GROWTH STATUS.....

Particular note is taken of the overwintering status and vegetative bud breaking ability of the bush. Delayed leafing may lead to later and smaller fruit, as distinct from evergreen plants such as Sharpeblue. A decision must be made by the grower as to whether he will desire a deciduous form of culture, or whether the ever-green culture will be pursued. The outbreak of rust on the far north coast has made evergreening culture to be more of a problem.

- BUSH BALANCE.....

Overfruiting may be controlled by pruning and thinning out clusters, but with a variety such as Misty it needs to be addressed constantly in order to prevent the bush from fruiting itself to death.

- DISEASE SUSCEPTIBILITY.....

An assessment needs to be done of root rot susceptibility on the one hand and the susceptibility to fruit and leaf diseases on the other. The potential resistance to blueberry rust (*Pucciniastrum vaccinii*) is now a criteria that is closely judged.

Fruiting Characteristics

- FRUIT FLAVOUR.....

At this point I am happy to swim against the prevailing thought that "as long as the fruit looks and feels good it will sell". I happen to love eating blueberries and have done so for 28 years, and have the long term view of the industry at heart. The balance between sweetness and acidity is of primary importance to the edibility of the fruit.

- SEASON.....

Earliness is a sought after factor in warmer areas to avoid both the low priced markets and the wet season. Fruit produce prior to the end of September is likely to be used primarily on domestic markets, but from October through until Christmas, a lucrative export market has been developed for blueberries in Asia, and Europe, after the finish of the Northern hemisphere season.

- TOTAL FRUIT YIELD.....

Obviously this factor is to be considered in the choice of varieties as well as in any budgeting for the future.

- RIPENING COMPACTION.....

Especially where machine harvesting is considered, varieties that ripen the bulk of their fruit in a short period are preferred. Evergreening varieties such as Sharpeblue however may provide the grower with a useful income for as much as 6 months of the year.

- FRUIT SIZE.....

For hand picking and fresh markets, the larger berry size is a premium, as picking rates will be greatly influenced by fruit size.

- FIRMNESS.....

The consumers preference for crisp fruit (e.g. Apples and grapes) will also be a factor in variety selection, and this factor also is important in keeping quality.

- PICKING SCAR.....

Fruit that picks with either a wet picking scar, or that tears at the stem end as it is picked is rejected from any selection programme due to the influence that these factors have on shipping and storage characteristics. A wet scar is an easy point of entry for disease.

- COLOUR.....

A light powdery bloom is preferable to a darker berry, as the bloom is in fact a natural wax that keeps the berry fresh.

- CLUSTER.....

Berries held in open clusters are easier to harvest than where they are held in tight bunches, where the fruit may also become misshapen. Tight clusters also provide a 'hiding place' for insect pests such as grubs and scale.

Management and other Criteria

- BUSH SHAPE.....

This again is an issue for assessment particularly where machine harvesting is being considered. Low, sprawling bushes require much training and care to get them to stand upright to facilitate over the row machine harvesting.

- EASE OF PROPAGATION.....

A number of selections have been released as varieties, only to be avoided due to the fact that nurseries cannot propagate them due to genetic factors.

- PLANT DEVELOPMENT.....

Both in the nursery and field situation, it is important that the plants develop into healthy and strong bushes, without being held back by excessive fruiting and flowering.

- FLOWERING / POLLINATION CHARACTERISTICS.....

Plants have on occasion been rejected due to problems in finding a suitable cross-pollinating variety or due to the problem of premature flower shedding.

Post Harvest Characteristics

These include storage and shipping characteristics that may become evident with time.

Varieties

The following varieties are or have been assessed for suitability to Northern NSW in recent times.

FLORIDA..... Sharpeblue, Misty, and Sunshineblue.

GEORGIA..... Georgiagem, Brightwell, Climax, Tifblue,.

MISSISSIPPI..... Biloxi, Gulf Coast, Magnolia, and Jubilee.

NORTH CAROLINA..... O'Neal, Reveille, Premier, and Powderblue

These above varieties listed do not include many of the earlier importations such as:

Highbush types..... Flordablue, Avonblue.

Rabbiteye types.... Becky blue, Aliceblue, Bonita, Bluegem, Centurion, Woodard, Bluebelle and Briteblue,

Nor do they include patented varieties to which individuals or corporations hold exclusive rights.

Recommendations

This is a vexed question, as the answer will invariably be different for different localities and soil types.

For early highbush types the best recommendation that may be given would be for Sharpeblue and Misty to be interplanted for cross-pollination, and lesser numbers of Biloxi.

Mid-season..... Magnolia and Jubilee, (Southern Highbush) Premier, Climax. (rabbiteye varieties)

Late-season..... Powderblue, Tifblue, Brightwell.

In Conclusion

Some years ago I was talking with Dr. Paul Lyrene, the blueberry breeder in charge of the low chill breeding programme at the University of Florida in Gainesville. I asked him his opinion of the most suitable varieties for us to grow in our area. Unequivocally, he came up with the following answer:

"Of the hundreds of potential shortcomings, which are the ones that you are willing to live with?"

We are all striving for the ultimate blueberry, for which the bottom line is probably \$ returns to the grower, and consumer satisfaction. Over the past 28 years I have come to the conclusion that there are no short cuts to this, but with persistence and the investment of money into this important research, we will move closer to this goal, which offers probably the greatest area for advancement of this industry.