

# Ambrosia— a Home-Grown B.C. Apple

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**A**mbrosia is an attractive, juicy, sweet apple discovered on our orchard in Cawston, B.C., as a chance seedling in a row of newly replanted Jonagold apples.

It first came to our notice as a small shoot with a few apples on it; they were different in appearance and flavor from the other apples in the row. The next season, there they were again but this time there were a few more—until the pickers, not usually given to eating apples, stripped the tree! With each successive season these reactions remained consistently positive as an ever-widening circle of family, friends and workers tried the apples.

We began the process of testing “that apple” by budding several M.26 rootstocks to see if the fruit would remain true to type. By 1993 we had apples on these newly propagated trees, showing the same desirable characteristics that we had observed in the fruit on the original shoot. We needed to find a name and, because it was honeyed and juicy, we called it “Ambrosia.” Our growing realization that this was an apple that should be taken seriously happened to coincide with the incorporation of the newly formed Plant Improvement Company of the Okanagan (PICO). It was suggested that we approach PICO, and they liked what they saw. The result was that we licensed PICO to act as our agent for the testing and commercialization of Ambrosia.

PICO applied for Plant Breeders’ Rights on our behalf and began propagating Ambrosia trees for testing. Test blocks were established with growers in different parts of the Okanagan Valley in order to determine the suitability of the tree for different growing conditions and sites and the consistency of the fruit in these different growing conditions. At this stage PICO also began to test the eating qualities of Ambrosia by conducting taste tests among growers and the public, giving wider exposure to the apple and an opportunity to evaluate its appeal to the consumer.

In 1994 PICO sent Ambrosia plant material to the Federal Quarantine Station at Saanich, on Vancouver Island, where it was tested for viruses and two were discovered—stem grooving virus and apple chlorotic leaf spot virus. After some difficulty these were removed using heat treatment, and a few virus-free buds were finally released in 1997.

That same year, Wilfrid and Sally Mennell were registered as the owners of Canadian Plant Breeders’ rights for Ambrosia. PICO was now

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able to release plant material to growers for planting commercial blocks of Ambrosia. The growers, liking what they had seen in the test blocks and reassured by the response to consumer taste tests, began to plant Ambrosia with an enthusiasm that has, until now, outstripped the availability of trees and propagation material.

The Mennells now hold plant patent rights in the USA and are in the process of establishing protective rights in other jurisdictions.

## **FRUIT CHARACTERISTICS**

Ambrosia is a medium- to large-sized apple of conical shape. Its skin color is a pinky-red blush with faint stripes on a cream to yellow background, giving it an attractive, bright appearance. It is characteristic of Ambrosia to show the background color in the calyx end bowl.

Ambrosia is a sweet, low acid, very juicy apple with a pleasant aroma. Its flesh is white, crisp and fine-grained and, once cut, the flesh is slow to brown. In taste tests and sensory panels, Ambrosia usually rates highly, not because any single characteristic is outstanding, but because the combination of all these characteristics produces a highly edible and appealing fruit. The apple is characteristically clear skinned with little tendency to russet.

## **TREE CHARACTERISTICS**

Ambrosia is “grower friendly.” The tree has an upright spurry growing habit. Because it is precocious and sets fruit buds readily, it is best “pushed” in the first years after planting. Once it sets up fruit buds, it will fruit consistently. On M.9 the tree wants to produce fruit rather than wood. On the smaller rootstocks it is important to maximize the bearing surface of the tree as early as possible. It should be noted that the

nitrogen needed for early growth should be reduced as the tree begins to produce fruit. Too much nitrogen will cause large fruit with green background, advanced maturity and reduced storability. When there are high nitrogen levels, it is recommended that calcium be applied to address the imbalance in ratio of calcium to nitrogen. While there is some concern about oversized fruit, there is also concern about small fruit of inferior quality because of overcropping. Ambrosia has a tendency to crop heavily, and the size of the crop should be matched to the size and vigor of the tree, i.e., balance the crop load.

In B.C., Ambrosia is grown mainly on M.9 rootstock, which produces a lot of spurs or feathers off the central leader, with a few unusually strong upright branches. This is well suited to high density super spindle plantings where the few strong branches are easily ripped off. However, in a less dense growing system, more vigorous rootstocks may be considered. Some have reported success with B.9, which seems to branch more than the M.9. Some nurseries in the USA are using the larger M.7 rootstock. With the larger rootstocks, light penetration and color may become an issue.

Any diploid variety flowering in mid-season seems to meet Ambrosia’s pollination requirements. To date Ambrosia does not appear to have any undue susceptibility to diseases such as mildew or fire blight. As yet we have not had winters hard enough to test its winter hardiness.

## **HARVEST AND STORABILITY**

This is a mid-season apple, similar in timing to that of early Red Delicious. In our area, Ambrosia is usually harvested at the end of September and beginning of October. In this climate Ambrosia begins showing red blush only about 2 to 3 weeks prior to harvest. Until then it looks rather like an immature Golden. At optimal maturity the background color usually changes from pale green to cream which, when contrasted with the pinky-red blush, gives the apple a luminescent appearance. The primary method of determining maturity is the starch test. We have used both the Jonagold and Golden starch charts. The technical committee for the newly formed Ambrosia Council has come out with some very specific recommendations. Dr. Sam Lau, Postharvest Physiologist at Okanagan Federated Shippers, has been monitoring the harvest and storability of Ambrosia

since 1993 and has found that, once in the harvest window, its starch levels can change by 1.5 starch units per week. Indeed, in some years that harvest window may be only 10 days.

Dr. Lau's reports show that Ambrosia is usually good for 3 to 4 months of air storage and up to 6 months in CA storage when harvested within the prescribed harvest guidelines. He feels that CA storage is the preferred means of storage for Ambrosia because, as a low-acid apple, it is better able to retain its titratable acidity in CA storage.

This variety is a two-pick apple, usually harvested about 80% in the first pick and 20% in the second pick. Oversized, overmature fruit on vigorous trees can split or crack on the calyx end. However, picked within the recommended guidelines, Ambrosia usually packs out at about the 90% level.

### MARKET RESPONSE

Since beginning our journey with Ambrosia, the most rewarding part has been the enthusiastic response of consumers, growers and the media.

Organic sales led the way with the marketing of Ambrosia. Organic stores ran multi-varietal taste tests of apples and found that Ambrosia consistently placed as one of the top varieties. Buyers wanted as many Ambrosia as they could get, and organic growers have been quick to respond. Acreages have increased dramatically and sales have continued to grow with Ambrosia still commanding a premium price.

In 1998 there were about 50 bins of conventionally grown Ambrosia. Since then production has more than doubled each year. In-store demos and taste tests were accompanied by evaluative surveys which showed strong positive consumer response.

For the past 3 years Ambrosia, insofar as plant material has allowed, has been the variety of choice for growers replanting their orchards in the Okanagan. Aware of the rapidly expanding production capacity, they have formed a New Varieties Council, mandated to introduce Ambrosia and develop the market for the variety. They feel that the variety's strength in the market will be based on its maintaining consistently high quality.

This season Ambrosia was available in retail outlets throughout western Canada and from a few stores in eastern Canada, as well as California and the northwestern USA, albeit in limited quantities. Sales are currently being evaluated with a view to developing a strong market strategy for the future.

### CONCLUSION

We feel that we have been fortunate indeed to be able to participate in something as exciting as the development of Ambrosia. It certainly has been a challenging learning experience but we are very aware that any new variety is a gamble, particularly today, given the large investment made by growers when replanting.

From a few distinct apples on an anonymous shoot has come Ambrosia, an exciting new apple variety. We recognize that the next steps for Ambrosia will be important. We believe this apple will meet the expectations that are made of it and that Ambrosia will fulfill its promise.

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