ALASKA PIONEER FRUIT GROWERS NEWSLETTER

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NEW NEWSLETTER EDITOR TO START IN SPRING 2000

Tami Schlies (address above) will begin editing the Alaska Pioneer Fruit Growers Newsletter after this issue. Please let her know about topics that you would like her to research for inclusion in future newsletters. I would like to thank those of you who have contributed to Newsletter since I began editing it in 1994. Please keep them coming; Tami is soliciting contributions for the Spring 2000 issue.

APPLE GROWING NEAR EDMONTON, ALBERTA

—by Bernie Nikolai

Dwight Bradley suggested I update the Alaska Pioneer Fruit Growers with my recent experiences in apple growing in central Alberta. By way of introduction, I have an orchard of about 200 apple trees one half hour drive west of Edmonton, Alberta. My trees are from one to five years old, and are of many varieties and on numerous rootstocks. Basically, anything I thought had a ghost of chance surviving in my climate, I planted. My coldest temperature was about –45°F during the test winter of 95/96. Temperatures of –40°F and slightly colder down to about –45°F occur about every second winter. Unfortunately we often get a lot of wind in the winter, although on the very coldest days its usually calm with ice fog. Last and first frost on average is about May 24 and about Sept. 15. Our summer temperatures are very similar to Fairbanks, with an average high in July being about 73°F, with only a few days in the eighties and every second year it might hit the low nineties. To keep out the deer I have an 8 ft. gamewire fence erected around the orchard.

The rootstocks I'm trying are Ranetka, Siberian Crab, Columbia Crab, Bud 490, Bud 9, Ottawa 3, P22, M26, and V 1, 2 and 3 (new rootstocks from Vineland, Ontario, M9 x Kerr applecrab crosses). I have yet to lose a single tree due to the death of the rootstock as we always seem to get a good snowcover that lasts all winter. Minimum soil temperatures at 6 inches under the soil (under the snow) never get colder than 14°F according to government tests in our climate, and obviously all the above rootstocks can take this temperature, or they would have died. If I wanted to be safe I'd use only Siberian and Ranetka. As a rule, a three year old tree on Siberian rootstock is only as big as a two year old tree on Ranetka, so Ranetka would get the nod as it produces a larger tree faster. If you got a week of –40°F and zero snowcover, over 90% of the Ranetka would pull through and probably 98% of the Siberian, so both rootstocks are probably the two most hardy apple rootstocks available on the planet. Both Ranetka and Siberian also seem to be quite drought resistant, which I believe to be quite important unless you are among the few northern growers who uses irrigation. We average about 18 inches of precipitation annually in Edmonton, with a June and July maximum.

I've tried over 70 diferent apple varieties, many of which I've discarded due to lack of hardiness (example Ginger Gold, McIntosh) or a lack of quality (example Heyer 12). My objective is to grow the absolute best tasting fresh-off-the-tree

large apples possible in my severe climate, with a secondary objective of good baking and juicing qualities. Each year I "ruthlessly" hack off and regraft trees if they don't match up to my quality and hardiness standards. So what are the "winners" so far from my testing?

The Winners (Drum Roll Please):

Simonet 1847. Rock solid hardy, and not a hint of winter dieback after -45F during the winter of 95/96! This is a local seedling from Edmonton with unknown parentage, but rumoured to possibly be Haralson x Rescue Crab. It is ripe in early September, and similar in size and appearance to a Royal Gala. Excellent taste, and many folks are amazed an apple of this quality can be grown in Edmonton. Clair Lammers in Fairbanks is growing this apple, and may have a limited number of trees for sale this spring.

Prairie Sun. This is a brand new cultivar (Brookland x Goodland) just released by the University of Saskatchewan in the spring of 1999. The best description I can think of is that Prairie Sun is a "Goodland" that matures about a month earlier (Prairie Sun matures late August for me), and is also much hardier and more productive than Goodland. This cultivar has produced full crops in Saskatchewan after winters as cold as –54°F! It is a large apple with a small core, has a yellow/green background with a red blush on the sunny side, and is good for fresh eating and OUTSTANDING for pies. Its main selling points are extreme hardiness coupled with tremendous productivity even after exceedingly harsh winter conditions. The licensed propagator is Jim Boughen, of Boughen's Nursery, in Nipiwin, Saskatchewan (phone 306-862-3343). I understand Jim has one year whips of Prairie Sun on Siberian Crab rootstock ready for sale this spring of 2000. If you can get a tree or two of Prairie Sun, well, just do it. You won't be disappointed.

Zestar (was Zesta), from the University of Minnesota, a new release. This apple fruited for the first time during the 99 season in my backyard in the city, which is warmer by at least 5°F in terms of winter temperatures than my orchard site. It is fully hardy to –40°F, but I can't comment on any colder temperatures as it hasn't fruited at my orchard yet. This apple is OUTSTANDING in terms of fresh taste. Its a medium sized apple, pleasant light red in color, and ripe early September. It is available from a select few nurseries in Minnesota, and you might try calling the U of Minnesota directly for licensed propagators if you can't find a source.

Honeycrisp, from the University of Minnesota. Honeycrisp fruited for me for the first time in my backyard on 4th leaf M26 rootstock this fall. It was ripe Oct. 7 (this was a late year for apple maturity) and was AMAZINGLY GOOD! It is important to note it has yet to fruit at my significantly colder (outside the city) orchard site, and may well be too late in maturity to grow successfully in Alaska. The apple does take frosts easily down to about 24°F without damage, so if you think you can get away without temperatures much lower than this until late September or early October, then Honeycrisp is definitely worth experimenting with. It has survived –40°F for me in the city without damage. My experience is that both Zestar and Honeycrisp are hardier and significantly better tasting than either State Fair or Sweet 16, two other relatively recent Minnesota introductions.

The above four apples are the clear "winners" in terms of fresh taste from my experience. The first two (Simonet 1847 and Prairie Sun) should easily survive and produce well in much of Alaska, while the latter two (Zestar and Honeycrisp) would be for trial only in the better and milder winter areas.

In addition I'd like to offer another ray of hope to Alaskan growers. I have a few other test advanced selections at my orchard, and there are a number of truly outstanding apples "in the pipe" that should be released within 2 to 5 years. My personal favorite is a McIntosh cross (with an ultra hardy prairie apple variety) that to me tasted better than the BEST McIntosh I have ever tasted!!! This test selection has been fully hardy at my orchard so far, but has only just started to fruit for me. I am personally convinced that apples now exist, and will be released within the very next few years, that take –50°F and colder, yet have full commercial capabilities and taste. So if you are a bit discouraged by what we can grow in cold climates so far in terms of apples, my advice is "Hang in there, you ain't seen nothin yet!" The best by far is truly yet to come.

FRUIT GROWING IN MINNESOTA— FIRST IMPRESSIONS

-by Bob Purvis (12/27/99)

During the period March 1992-October 1999 my wife and I lived in Selah, WA, where I had about 245 fruit trees. At the end of October, we moved from our home there to the outskirts of St. Paul, MN, where I began work as an agricultural statistician with the Minnesota office of the National Agricultural Statistics Service (NASS), USDA. So, my life has come full circle in 11 years—I am once again working for the Federal government in a cold climate.

In the four weeks since our arrival here, I visited two commercial apple growers in Cottage Grove, MN, where we bought a house. On November 24 I spent four hours with David Bedford, an apple breeder at the University of Minnesota's Horticultural Research Center near Excelsior. In this article, I'll relate some of the things I learned which might be of interest to members of the Alaska Pioneer Fruit Growers.

The Minnesota fruit industry is small compared to Washington State's, producing only about 1-2 million boxes of fruit per year versus about 80-100 million. There are about 150 apple growers in the State, versus about 3000 in Washington. The majority of them are around Minneapolis-St. Paul because it is the population center of the State, but the largest orchards are in the southeast part of the state. There is one growers' organization here: the Minnesota Apple Growers' Association, which meets monthly and had its annual meeting scheduled for Jan. 4-6, 2000.

Mr. Bedford estimates the average yield of a Minnesota orchard is around 500 bushels (= boxes) per acre, translating to about 20 bins/acre of apples before they are packed. (By comparison, in central Washington a mature orchard should be able to produce at least 40 bins/acre if it is properly managed, and on some varieties such as Golden Delicious yields can sometimes exceed 100 bins/acre.) Planting density statewide in 1993 averaged 123 apple trees/acre.

Apple growers in Minnesota are able to survive and earn a living by virtue of selling their apples directly to the public via on-farm roadside stands, by adding value to the product by processing it, and by offering other attractions to lure people to the orchard. Furthermore, they sell about 90% of what they grow within the state, so unlike growers in Washington they are not affected by the vagaries of the export market. On top of that, they grow what they know the typical Minnesotan likes to consume. According to Bedford, about two-thirds of the varieties grown commercially in Minnesota were developed in-state, of which Haralson is by far the most widely grown. Production of Honeycrisp is rising rapidly, however, not just because it tastes great, stores well, is a grower-friendly tree, and can survive -5O°F cold, but because it sometimes brings returns of $50/box, eight times what McIntosh might bring at present. In 1993, Connell Red, Regent, and McIntosh ranked #2, 3, and 4 in production after Haralson.

A large wholesale nursery near St. Paul, the primary source of fruit trees sold at retail outlets in Alaska in the 1980s, supplies about 99% of the fruit trees sold retail to homeowners in MN and the North Central states. This nursery has a number of fields in Woodbury, the easterly St. Paul suburb just north of Cottage Grove, but requires a $1000 or larger order to buy from it. It was selling both Zestar apple and Bali tart cherry in their 1999 catalog. It is worth noting, however, that only 2% of their nursery-stock sales are of fruit trees.

In my visit with a grower who has an 18-acre orchard near Cottage Grove, I found a lot of Haralson trees, but in 1999 many of the apples were left on the trees because of severe russeting. By mid-November, Honeycrisp was sold out not only at his orchard, but evidently everywhere in the State. (Thank goodness, I was able to bring a box of Honeycrisp picked from my trees when we moved.) He spoke approvingly of the flavor of the first fruits he had harvested from his young trees of Zestar and Pinova. Zestar ripens just after Beacon and was introduced by the U of MN about 2 years ago. Trees of Zestar (formerly known as Zesta!) were available from a wholesale nursery in Ephrata, WA in the spring of 1999 as well as from a large greenhouse and garden center a few miles from our apartment in Inver Grove Heights. Pinova, developed in Germany, ripens at about the same time as Golden Delicious and would probably be difficult to ripen in Anchorage although its winter-hardiness is excellent, and it is available from some of the major nurseries in Wenatchee, WA.

The Cottage Grove orchardist reported that in February, 1996 there had been a freak occurrence of –50°F at his orchard. (Most winters they see –25°F at least once.) Honeycrisp on M.26 suffered winter-injury at those temperatures, but those trees have recovered well and are of a large size (10-12 feet tall and spreading). Mr. Bedford commented that apple and pear trees suffer more injury in extreme cold in the heartwood of the tree than to the twigs, flower buds, and leaf buds. By contrast, stone fruits suffer injury to the flower and leaf buds and twigs more commonly at cold temperatures than to the heartwood.

The Minnesota Extension Service recommends that apple growers harvest their fruit by October 20, and he was able to ripen Cameo by that date in 1999. Keepsake is the latest-ripening apple in most commercial orchards here, however. Gala is satifactorily winter-hardy in Zone 4, but at Excelsior Braeburn and Fuji are too winter-tender and too late to ripen. The Excelsior site experiences –25°F almost every winter.

With reference to cold storage facilities, there are very few orchards that have cold storage for anything later than the fall. So, where to store the apples I brought from my home orchard is a major issue.

In Alaska, choice of rootstock is a life-or-death matter for apple trees. Here in Minnesota, the Zone 3 or 4 climate notwithstanding, winter-injury to rootstocks is extremely rare because snow cover is reliable. The Cottage Grove orchardist found M.7 and M.26 to be reliable stocks, and Bedford mentioned that even MM. 106, which goes dormant slowly in the fall, survives okay for the very few growers who use it or MM.111. He is now using Bud.9 extensively as a rootstock to which to bud chips from the seedling trees in his breeding program.

The number-one pest on apples here is apple maggot. Codling moth, the scourge of apples in arid climates, is a distant second, and there are occasional problems with leaf miners or aphids. Bedford believes that the cold climate here tends to keep pests and disease in check to some degree. Because of the very swift transition from winter to summer, spring frost damage to apple blossoms is almost unheard of.

The major limiting factor for growing pear trees in MN is winter-injury; fire blight is a secondary problem. Among the pear varieties which do reasonably well here are Parker, Patten, Luscious, Gourmet, Summercrisp, and Ure. Bedford has made a number of crosses of European with Asian pears, to gain better precocity in bearing as well as a more crunchy texture, and he believes that in the spring of 2000 some of the trees will have their first fruits. I sent five trees of Beurre Giffard to him in October, which he will be testing for cold hardiness. Concorde pear has not been tried at Excelsior, but Harrow Delight proved to be marginal in its winter-hardiness there. Pear psylla are almost unknown here; he said that it would be quite possible to grow pears organically here.

From my studying a guide to roadside markets in MN, it seems there is virtually no commercial plum production in MN. Mount Royal is the most reliable of the European plums and crops well 3 years in 5, in Bedford's experience. He is looking forward to testing the Opal plum, which a retail nursery in Princeton, MN has offered in recent years. The primary insect pest of plums here is plum curculio, but it is rarely a problem. Black knot is the most common disease of plums and cherries here, but it is only a minor problem that can be controlled by pruning out infections. The Schubert chokecherry is the most common host of this disease, and Mr. Bedford is looking forward to testing the Bali cherry.

With reference to apricots, Moongold and Sungold have crops at Excelsior about 3 years in 5. They are only fair for fresh eating but make excellent preserves. The major issue with apricots here is flower-bud survival of midwinter cold. Less common is injury in early spring when the buds begin to swell, and rarely, injury when the trees are in bloom. Although Goldcot has fruited in Anchorage, it is not reliably winter-hardy at Excelsior. I am eager, as is Bedford, to see how M.604, Debbie's Gold, Westcot, and Brookcot will do in this climate. I should note in passing that these four varieties all had an excellent bloom for me in April, 1999, but Brookcot was at least 3-5 days later in coming to full bloom than the other three. (Based on the few apricots I had from my tree in Selah, I rate the quality of Brookcot as comparable with the other three. The disparity in bloom date under the cool, cloudy conditions of 1999 suggests that Brookcot may be worthy of further attention by northern growers.)

A final word: the University of Minnesota has a

very active strawberry program, headed by Dr. Jim Luby, in which most of the breeders on staff are involved. Strawberries are being tested not only at Excelsior, but also at Grand Rapids (a Zone 3 climate) and at Morris. Dr. Luby also leads the blueberry breeding program, which is active at both Grand Rapids and at Becker, where the soils are sandier and more acidic than they are at Excelsior.

The home we bought has 0.5 acre of land with it and space to plant perhaps a few dozen trees at most. It is somewhat sheltered from the wind and has good sun exposure, but I do not know what the soils are like. We moved in December 1, and as of now our address is 7300 Iden Avenue South; Cottage Grove, MN 55016, phone (651)-769-8473. I welcome comments on this article, especially about the cultivars I mentioned, or correspondence from other members of the AFPG or NAFEX and can be reached by e-mail at my office, at rpurvis@nass.usda.gov, or by telephone at 1-651-296-3173, my working hours being 7:45 to 4:30 M-F.

GRAFTING FRUIT TREES SUCCESSFULLY

—by Lamond Hardy
312 N.E. 80th Ave.
Okeechobee, FL 34974

(The following article was found by Bob Boyer. It was used with permission from Countryside and Small Stock Journal, v. 79, no. 2. March/April 1995. The methods that Lamond Hardy describes were developed by him beginning in 1931. Regardless of whether one accepts his explanations, his empirical observations speak for themselves.)

Part one: Inducing early bearing

This article explains how to induce an early bearing age into fruit trees that will match the precocity of any trees produced by vegetative methods taken from mature (fruiting age) parent plants. My experience has shown that seedling fruit trees are usually delayed in flowering or fruiting for many years, while plants produced by grafting, cuttings or air-layers (which shall be referred to as "vegetatively propagated") may fruit within a year or two. However, vegetatively propagated plants must be taken from mature fruiting parent trees to expect this early fruiting phenomenon. If such plants are taken from a "juvenile" seedling tree that has never flowered or fruited, they typically will not flower or fruit until the parent plant (same clone) comes into maturity.

The validity of this has been demonstrated by reversing the premise. I, and others, have observed that if a scion from a young seedling is grafted onto a mature fruiting tree, that scion will pick up the fruiting factor from the root-stock and become an early bearer.

I concluded that there is a hormone connection, when it can be shown that a chip bud taken from a mature citrus tree and grafted onto any young seedling will contain enough of the "wonder" ingredient to produce the desired early fruiting habit. Without the presence of this adult fruiting hormone, some seedling lychee trees have been known to be delayed into fruiting for 30 or more years.

At this point it would seem obvious that all one needs to do to induce a batch of seedlings into early bearing would be to inject those seedlings with the same hormone that a small chip bud seems to contain. Why is this not done? I made this discovery in 1931!

A 1931 discovery

In 1931 I chip-budded a row of sweet orange seedlings with scions taken from a mature grapefruit tree. Some of the orange seedlings (containing the grapefruit chip-buds) were allowed to retain their seedling tops. I noted that those sweet orange seedlings flowered and fruited at the same early age as the trees grown from grapefruit chip-buds. This caused me to suspect a hormone linkage.When this hormone is chemically identified, manufactured synthetically and injected into seedlings, it will bring about the same early bearing habit as is characteristic of grafted trees, opening up a vast new research frontier. Some examples could include early bearing of seedling groves, and early bearing for selecting improved varieties for disease resistance and fruit quality.

Since my discovery I have conducted many experiments, all of which indicated the hormone connection to early bearing age. One such test was conducted in Okeechobee, Florida, in 1989 to 1991. This experiment involved 100 Rangpur lime trees which began as seed planted in October, 1989, and were in flower within 14 months. The experiment was conducted as follows:

1. In October, 1989, the Rangpur lime seeds were collected and planted.
2. In March, 1990, the seedlings were chip-budded in their basal area where the diameter size was best for working (soda straw to pencil size.)
3. In April, 1990, all grafts were released from their plastic wraps and the root-stock tops were removed and rooted in a mist bed.
4. In January, 1991, at 14 months of age, all of these Rangpur lime plants derived from rooted tops came into full bloom.
5. A control group of 50 non-treated Rangpur seedlings of the same age did not flower until they were 1-2 years older than the rooted Rangpur tops.

I have conducted many other types of experiments to test for the connection of a hormone-related influence to the early bearing habit of vegetatively propagated plants. One involved hypodermically injecting into young seedling plants a concoction extracted from mature, bearing plants of the same species. This seemed a very logical test in trying to zero in on the concept of a hormone-related cause to early fruiting.

The material collected for these hypodermic injections was prepared by grinding in a blender cambium, leaves, and flowers in distilled water. The resulting liquid was filtered and injected by hypodermic syringe into the cambium and sap wood of the young seedling trees.

Success was phenomenal, and has been achieved when tried on several different species such as annonas, citrus, mangoes and avocados. Cross-testing over species line was only conducted between avocado and redbay, using redbay vaccine injected into the avocado. It worked.

When, and if ever, a sophisticated laboratory should identify the "magic" hormone that causes early fruiting, manufactures it synthetically and makes it economically available to plant breeders, it will open a vast new frontier.

Part two: "grafting" and "growth" hormones.

There are hormones in the enzymes that are growth regulators. These are scattered around the plant, telling it when to produce a leaf or a flower, or when to shed a leaf. I have discovered many plants that will have growth hormones in that area of the stalk below the canopy that can be turned "off" for growth, and will prune anything that happens to be there or anything that you put there. It will prune many of our grafts. So if we can turn off this "pruning hormone" and turn on the "growth hormone" it will improve our grafting.

We do not really need to know what the hormone is—just how it works and how we can control it—just like we don't know why, when you hatch a rare pheasant or quail in an incubator, it will give you crooked toes and crooked tendons. But when you put them under a pigeon, duck or goose or any other kind of bird, they will hatch with practically a 100 percent take. We know it has nothing to do with difference in body temperature because the temperatures of these birds vary by three or four degrees. In an incubator the temperature varies by just a half degree. Something happens.Anyway, we don't have to know the reason. We just need to know how to do the manipulation to get the results we want.

We know that in spring, a tree is ready to bud out somewhere, but maybe not where we want to put a graft on. In that area below the canopy, many plants have that "turn-off" hormone and will want to prune themselves in that area. And it is not about to accept our graft and make it grow if that hormone is in full occurrence. We want to change that mode and make it ready to promote growth in that area so when we put a graft there it will take, live and grow. Here's how to do it.

Girdle the branch just above the desired area or "hat-rack" the branches above that point. Then, approximately two weeks after that, when the plant is starting to throw out new buds in that area, where the growth is "turned on," you put your graft on, using all the care of selecting and handling the scions properly and keeping them out of the sunlight. Place it on there and you can get 100 percent take.

First suspicions

I first became suspicious of a "turn-on" hormone and a "turn-off" hormone when I grafted 76 grafts on a cypress tree I wanted to use as a stockpile for a superior variety. It had about 76 side branches about the size of a lead pencil and I wanted to replace all of those branches with a superior variety. So about eight inches out from the trunk I put on 76 grafts of

the best-style veneer graft of the best-prepared bud wood I could get. And it was practically 100 percent failure. One graft was partially alive and after many weeks it finally put out a little weak bud.

The turn-off hormone was in full force in that tree. The tree was wanting to prune itself in the area of the grafts. It was anxious to grow out the tips of its branches and on its top. But in the area where I chose to put the buds, the turn-off or "pruning" hormone was in full swing, so I had practically 100 percent failure.

All I needed to have done was one of two things: lop off all those 76 branches about 12 inches out, or girdle them about 12 inches away from the trunk and then wait three or four weeks until I could see little buds start in that area where they had previously failed. I did this, and redid those 76 limbs with 76 buds of the same refrigerated budwood that had failed a month or two earlier, and I got 100 percent take. I have repeated this experiment several times. This is why I had failures on some occasions and complete successes on others.

Now another little story that fits that category of thinking: There was a patch of wild persimmons near Gainesville. The fruits were about as large around as your thumb or finger. I wanted to graft them with a new variety that someone told me was the greatest thing out. I grafted those persimmons. Some took, and some didn't.

This was the spring of the year when the tops were flushing. That should have been the proper time. The budwood was kept in sphagnum moss in the refrigerator, and should have been good any time in the next six months. But some of them took and grew okay, and some failed. I replaced the failures, and they failed. I replaced them again and they still failed. I found plants that just didn't seem to be in the mood to accept a graft! In other words, those particular plants were programmed to prune in that area. Later I found that those plants that failed were all root-connected. They were the same clone and all had the same degree of turn-off hormone.

Well, I had already learned from my cypress tree experiments that there was a way to turn them on. I girdled them all just above where I was to put the new grafts. Some I cut off in that area and some I went a little higher and hat-racked them. After a few weeks, when they began to bud out, I re-grafted. Every graft was a success. This was the third year those particular plants (those clones that were root-connected and essentially the same plant) had failed, but then had 100 percent take when I used my method of turning on the hormone

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KETCHIKAN ORCHARD REPORT

—by Jerry Koerner
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Due to the *La Nina* reversal, Ketchikan experienced a very late and very cold spring in 1999, which severely effected our bloom time, pollination and ripening dates. Bloom time was delayed 4 to 6 weeks, as was the ripening dates for most of our apples. Pollination for the early blooming cherries and plums was terrible. We did not get a single cherry from seven different varieties of sweet cherries, and the only plum to set fruit was a handful of small plums from our Shiro. In spite of the poor spring conditions, we did manage to ripen 47 varieties of apples, which is down from last year's crop of 65 varieties. Many of the varieties did not color up well and they failed to develop their usual flavors. Our favorite new apple for 1999 was Laxton's Fortune (Cox's Orange Pippin x Wealthy). It developed a wonderful sweet-tart flavor by early October. Another late ripening favorite of ours is Sansa (Gala x Akane). We have to let them hang on the tree until the end of October but they are well worth the wait. We had another good crop of James Grieve, large juicy apples that we like to run through the juicer, and our Pristine trees came through with another good crop of beautiful golden yellow sweet-tart apples. Since we are running out of room here at the nursery for many more new trees, I have been grafting my new varieties on Bud 9 rootstocks instead of our usual EMLA 7. We now have more than 300 different early ripening apple varieties that are on trial here in Ketchikan and we will be adding more as we continue our research.

Apple Varieties and Their Characteristics Grown in Ketchikan, Alaska, 1999

Variety	*Size*	*Color*	*Texture*	*Crisp*	*Sweet*	*Tart*	*Ripens*	*Rating*	*Description*
Akane	SIM	*R,Y*	H	Y		Y	Sept	4	High Disease Resistance
Almata	M	R	M	Y	Y	Y	Oct	4	Superior to Pink Pearl
Beauty of Bath	M	0	S		Y	Y	Sept	3	
Bonners Early	M	YIR	S			Y	Sept	1	Air Balls
Booths July Gold	SIM	GIY	H	Y		Y	Oct	3	Juicy
Breakey	M	R	M			Y	Aug	2	Susceptible to Scab
Devonshire Quarrendon	S	R	M			Y	Sept	2	
Earligold	M	Y	M			Y	Sept	2	Susceptible to Scab
Early Joe	S	RIG	H	Y	Y	Y	Oct	4	Red Streaked Flesh
Early Russet	MIL		H	Y		Y	Oct	3	
Emneth Early	MIL	G	H	Y		Y	Sept	4	Scab Resistant
Geneva Early	SIM	RIY	S			Y	Aug	3	Susceptible to Scab
George Cave	MIL	GIR	S			Y	Aug	2	
Goodland	MIL	Y	M			Y	Oct	3	
Guldborg	M	YIR	H	Y		Y	Oct	2	
Greensleeves	M	G	H	Y		Y	Oct	4	Juicy
Hazen	M	R	M			Y	Oct	2	
Herefordshire Redstreak	SIM	GIR	H	Y	Y	Y	Oct	3	Juicy
James Grieve	L	YIR	M	Y		Y	Oct	5	Very Juicy
Jefferis	M	GIR	H	Y		Y	Oct	3	
Lady Sudeley	M	GIR	H	Y	Y	Y	Oct	3	Juicy
Late Transparent	M	G	M			Y	Oct	4	Scab Resistant
Laxtons Fortune	M	R,Y	M	Y	Y	Y	Oct	5	Excellent Flavor
Lord Lambourne	M	GIR	M	Y		Y	Oct	3	
Lowland Raspberry	MIL	YIG	S			Y	Sept	3	
Lubsk Queen	M	0	S			Y	Aug	3	Susceptible to Scab
May Apple	SIM	YIR	M	Y		Y	Aug	3	
McLemore	S	RIY	H	Y	Y	Y	Oct	3	
Northfield Beauty	M	RIG	H	Y		Y	Oct	3	
Orange Sweet	S	R	M	Y	Y		Oct	5	Small but sweet
Pfirsichroter Sommerapfel	SIM	CIR	M			Y	Sept	3	Slightly aromatic
Prima	SIM	YIR	M	Y		Y	Oct	2	
Pristine	SIM	Y	M		Y	Y	Sept	4	Scab resistant
Pumpkin Russet	MIL	RIG	H	Y		Y	Nov	1	Did not ripen
Red Baron	SIM	RIY	H	Y		Y	Oct	3	
Redfree	MIL	RIY	M		Y	Y	Sept	2	High disease resistance
Rosthern 18	S	GIR	H	Y		Y	Oct	2	Juicy
Sansa	SIM	QIG	H	Y	Y	Y	Oct	6	Susceptible to scab and canke
Sops of Wine	M	RIG	M		Y		Oct	4	
Summerred	M/L	R	H	Y		Y	Sept	3	Susceptible to scab
Summer Scarlet	SIM	RIG	M	Y		Y	Aug	3	Scab resistant, can be bitter
Tetofsky	SIM	Y	M	Y		Y	Aug	2	
Tydeman Early Red	MIL	RIC	M	Y		Y	Sept	4	Susceptible to scab
Whitney Crab	S	RIY	H	Y		Y	Sept	4	
Williams Early Red	M	YIR	H	Y	Y	Y	Oct	4	Vinuous
Williams Pride	MIL	RIY	H	Y	Y	Y	Sept	4	High disease resistance
Wynooche Early	SM	RIC	H	Y		Y	Oct	4	High disease resistance

Color: C=Cream, G=Green, O=Orange, R=Red, Y=Yellow
Size: S=Small less than 2", M=Medium 2"-3", L=Large more than 3"
Texture: S=Soft, M=Medium, H=Hard
Rating: 1=Inferior, 2=Fair, 3=Good, 4=Very Good, 5=Excellent, 6=Superior