Korosi early. Korosi early ripens early about 20 days earlier than that of "Pandy," June 15-20th. The fruit size is relatively large with a diameter of over 20 mm. Because of its early ripening time, it is the first marketed in Hungary and is therefore easily exported. Its fruit is characterized by a refraction of 14.6, acid of 2.36% and a sugar of 15.2%. Its foliage is fairly dense with relatively little spur development. Its great advantage is a good capacity for self-fertilization (20%) yielding a regular and heavy annual crop. It is suitable for mechanical harvesting, because the fruit has a dry stem scar. It is resistant to *Monilia.*

The Pipacs morello cherry gets its name from Pipacs/Papaver flower because of its similar bright red color.

. The Pipacs morellos cherry has clear juice and probably comes from the Montmorency variety group which is grown in North-West Europe mainly in France, Belgium, and the USA.

The Pipacs variety group appeared in Hungary through spontaneous selection from the Montmorency variety group taken to Hungary before records were kept.

From this variety group two cultivars were produced by the above mentioned selection criteria: that is Pipacs 1. and Pipacs 2.

Pipacs 1. Fruit from Pipacs 1 ripens medium late approximately the last days of June in Hungary. Pipacs 1 has large fruit which are broad and dented on the stem side. The average size of fruit has surpassed 20 mm diameter during the years of research. (1977 22.6 mm, 1978 23.5 mm and 1979 22.2 mm) Its flavor is slightly sour-sweet making it a good ingredient for pastry.

It gives a good crop regularly because of its good capacity for self-fertility. Data of 1979 show that 12.6% of the flowers self-fertilized in artificial isolation. The ratio of self-fertility in 1980 was 19.7%. The foliage is half-round shaped. Thickly growing branches are fully covered with buds. It is early blossoming. It is not suitable for mechanical shaking. It is resistant to *Monilia.*

Pipacs 2. Pipacs 2 is similar to Pipacs 1 except that it ripens 10 days earlier. These two cultivars can be grown well together to prolong harvesting time.

Reviewed Research Paper

Breeding of New Disease Resistant Apple Varieties

SANDOR KOVACS[1]

The main objectives of our apple breeding program are to produce cultivars with good ecological adaptability, resistance or tolerance to powdery mildew *Podosphera leutotricha*, and to prolong the ripening time.

In order to breed good resistant cultivars we tried to find local varieties having proper characteristics for crossing. During research we found an old cultivar, Egri Red, of unknown origin which is resistant to powdery mildew *Podosphera leutotricha* and tolerant to scab *Venturia inaequalis.* (Described in *Fruit Varieties Journal,* January 1973, Vol. 27, Number 1.)

We have crossed Egri Red, a promising selection giving a good crop of red

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fruit, and 'Jonathan' in both directions. Hybrid seedlings resulting from the cross of Egri Red which ripens in mid-August and 'Jonathan' which ripens in the winter, ripen between these two periods of the parental varieties. A small minority ripened earlier or later. We therefore had a possibility to select varieties with earlier ripening than 'Jonathan.'

We have selected from hybrid seedlings 9 varieties that suit our purposes. They are as follow: Kr 1, Kr 2, Kr 3, Kr 4, Kr 5, Kr 6, Kr 7, Kr 8, Kr 11. In this series the varieties with even numbers ripen in summer or autumn and the odd ones in winter.

All of the varieties have red fruit and are resistant or tolerant to powdery mildew. Some of them are considerably tolerant to scab as well.

They are described in the order of their ripening periods using 'Jonathan' as a standard.

Varieties Ripening in Summer or Early Winter

Kr 2. Kr 2 ripens in the first days of August, 6 weeks earlier than 'Jonathan.' The fruit is medium-large or large, round, with a diameter of 65-75 mm and an even blush. Its taste is a little sweet with a pleasant flavor. Ripening does not last long as is usual with summer varieties, so it can be harvested in one picking. The apples do not drop even when ripe. The tree is medium large and gives a relatively large crop. Kr 2 is tolerant of mildew.

Kr 4. Kr 4 ripens in the middle of August about 5 weeks before 'Jonathan.' The fruit is medium large or large with an average diameter about 65-75 mm. The apples are round with an even blush. The fruit is tart with a good flavor. It ripens evenly and does not drop. The tree is medium large and tolerant of mildew. It gives high yields and the fruit is suitable for temporary storage.

Kr 6. Kr 6 ripens in the middle of August about 4 weeks before 'Jonathan.' Its fruit is large, bright red, longish coniform with an average diameter of 68-73 mm. Its fruit is tasty with a special flavor. The fruit ripens evenly and does not tend to drop. The tree is large with branches growing horizontally, so it should be grafted on a stock with weak vigor.

It gives a very large annual crop. The fruit is suitable for temporary storage. Kr 6 is resistant to powdery mildew.

Kr 8. Kr 8 ripens at the end of August about 3 weeks before 'Jonathan.' Its fruit is medium large or large with an average diameter of 65-70 mm. The surface of the fruit is evenly red. It has a pleasant tart flavor. The fruit ripens evenly over a short period and it does not tend to drop. The tree is medium or small size which makes it suitable for intensive cultivation and it is resistant to powdery mildew. It gives a large annual crop suitable for temporary storage.

Winter Varieties

Kr 1. Kr 1 ripens at the beginning of September two weeks before 'Jonathan.' Its fruit is medium large with an average diameter of 60-65 mm. Its whole surface gets evenly red turning a dark red when overripe. Its fruit is longish coniform with a rich flavor. The fruit flesh is nicely hard and when properly ripened it can be temporarily stored. It is a medium or small tree suitable for intensive planting and is tolerant to powdery mildew. The apples appear in bunches, even the one year old shoots are fully covered with buds. After planting it soon starts yielding and from then on it gives a large annual crop.

Kr 3. Kr 3 ripens the first days of September about two weeks before 'Jonathan.' The apples are large, slightly longish, and round-shaped with an average diameter of 72-75 mm with 80-90% of the fruit surface bright red. Its taste is tart but with a pleasant flavor.

The tree is round-shaped, and it grows with medium vigor. The apples

grow in bunches; even the one year old shoots are covered with buds. After planting it soon starts yielding and from then on it gives an annual high crop. Its fruit harvested properly can be stored well, over-ripened it soon softens.

Kr. 5. Kr 5 ripens in the middle of September or the second half of it, about one week after 'Jonathan.' Its fruit is medium large or large slightly longish round-shaped with an average diameter of 68-70 mm. The whole surface of the fruit gets evenly red. Overripened it is dark red, but does not drop. Its taste is tart but with good flavor. It ripens evenly and does not drop. The tree is medium size which makes it suitable for intensive cultivation.

It gives a large crop, and our experience proves that it can be stored well for a long time. It is tolerant to powdery mildew.

Kr 7. Kr 7 ripens in the second half of September about 2 weeks after 'Jonathan.' The fruit is medium size or large with a diameter of 65-70 mm. The fruit is a slightly flattened round-shape. It does not get red evenly over the whole surface. It ripens evenly and our experience has proven that it gives a good crop that will store well. Kr 7 is resistant to powdery mildew.

Kr 11. Kr 11 ripens at the end of September about 3 weeks after 'Jonathan.' The fruit is medium size or large with an average diameter of 68-70 mm. It is almost round. When ripe it is generally completely red. It is less tart than the other selections with an aromatic flavor. It ripens evenly and does not tend to drop. The fruit flesh is hard. The tree is medium size and is suitable for intensive cultivation.

It gives a large annual crop. It can be stored well for a long period of time.

This description outlined the variety candidates which ripen one after the other with a week's separation. In practice some slight shifts in the ripening periods can occur. However, the Kr series makes it possible for growers to select varieties with the most suitable ripening period for their orchards.

Wild Vitis Riparia from Northern U. S. and Canada — Breeding Source for Winter Hardiness in Cultivated Grapes — a Background of the Swenson Hybrids

ELMER P. SWENSON

Vitis Riparia is a very adaptable American grape species, as shown by its wide distribution. It is the base of my grape breeding, being the only species native in Wisconsin and Minnesota. Clones within the species are quite similar, but do vary somewhat in cluster and berry size, percentage of sugar and acid in the fruit ,and ripening, though being as a group very early in this respect. I have carefully observed the wild grapes and have used what I consider the best in breeding.

The first clone I used was growing in a large red oak in the eastern boundary fence of our farm, just up the hill from Pine Lake. It was the largest in berry size of any around here and was, of course, pistillate. I bagged and hand pollinated a couple of its clusters with pollen from Grandpa Larson's old cultivated grapes here in the house yard, that I believe to be