Pinova Apple Cultivar

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Pinova (synonym Corail) is an interesting newly bred apple cultivar from the German apple breeding program at Dresden-Pillnitz. At present this cultivar is commercially planted in Europe. It is in propagation in North America, South America, South Africa, Australia, New Zealand and not yet in Asia.

The parents are Clivia (Oldenburg x Cox Orange) x Golden Delicious, so the excellent taste of Cox Orange is combined with the good cropping capacity of Oldenburg and Golden Delicious and the storage and shelf life characteristics of Golden Delicious. The coloration is more like Oldenburg, the shape similar to Golden Delicious.

The breeders of Pinova are Johann Schmadlak, Heinz Murawski, Christa Fischer, and Manfred Fischer from the former Fruit Research Institute Dresden-Pillnitz. The breeding time was 18 years, and each person had an important part in the long breeding process. After the reunification of Germany, the cultivar rights for Pinova were transferred to the Free State of Saxon, with exclusive rights for propagation and distribution given to the German nursery group GEVO. Sublicensee for North America is Tree Connection, Dundee, OR. Willow Drive Nursery, C&O Nursery, Columbia Basin Nursery, Brandt's Fruit Trees, Pro Tree Nursery, TRECO Nursery and Van Well Nursery are sublicensees from Tree Connection. Pinova has plant breeder rights for Europe and it is patented for U.S.A.

Pinova is designed as a high quality red-fruited cultivar to complement Golden Delicious in the market until June. Very important is its low susceptibility to scab, winter frost, spring frosts and fire blight. Pinova has very good storability until May/June in CA storage and has excellent shelf life similar to or better than Golden Delicious. The trees are medium to low in vigor, precocious, bearing on one-year shoots and they do well on M.9, M.26 and Pi 80 Select (Supporter 4). On poor soils MM.106 can be used.

Pinova is pruned like Golden Delicious with regular renewal of fruiting branches and shoots. It does well as a slender spindle. The high flower numbers each year must be reduced by regular pruning and fruit thinning. Flowering time is mid-season or a little later like Golden Delicious. Pinova blooms regularly and abundantly. The cultivar is diploid and an excellent pollinator for several apple cultivars (Golden Delicious, Braeburn, Fuji, Cox Orange, Elstar, James Grieve, Melrose, Shampion, all known Pi-cultivars from Pillnitz, all known Re-cultivars from Pillnitz and others) because it blooms very heavily every year over a long time. The same cultivars are possible as pollinators for Pinova. No pollination is possible for/with Gala and Jonagold.

The yield is very high every year (95 to 160% of Golden Delicious; see Fig. 1); no alternate bearing was noticed. Pinova is ready for harvest in Germany at the beginning of October, in France at the end of September with or a little after Golden Delicious. For good coloration Pinova needs 2 to 3 weeks before harvest a variation in day/night temperature. Especially relatively cool night temperatures (+5°C, 41°F) are helpful for a full red color.

The fruit size is medium, similar to Gala or Golden Delicious. Unthinned and large trees bear too many small apples. The best fruits will be received from the upper branches of slender spindle trees. Fruit of 70 mm (2.75 inches) diameter from these regions is normal, that is, fruits of 130 to 160 grams. In dry periods trees need irrigation and every year full fertilization. Too much N is not good for the coloration of fruits.

Acidity, sugar content and fragrance of the fruits are intermediate (acidity [g/l]: 3.5 to 5.5; °Brix [soluble solids]: 13.0 to 15.4; pH: 3.5 to 3.8) (Table 1). The fruits

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are firm to very firm and good for shipping (penetrometer kg/cm^2: 9.5 [harvest] to 6.5 [end of storage]; for comparison Florina: 8.3 to 4.8, Idared: 8.3 to 4.5). The vitamin C content of Pinova is not high.

Pinova is not from the resistance breeding program. However, it is a robust cultivar without special problems of plant protection: the susceptibility to scab is low, to mildew is medium (mildew on the fruits brings a little russeting), to fire blight is low to medium (like Golden Delicious and better). Its tendency for second blooming is not a problem for increased fire blight infection. This phenomenon was tested in the field after strong artificial infection. Phytophthora and canker we have not observed yet. Bitter pit is seldom seen. Under extremely warm conditions sunburn on the south side of the fruits is possible. In Germany it was helpful in some years to spray before storage against Gloeosporium rot. Winter frost to -25°C (-13°F) has not been a problem under German and Polish conditions.

For good fruit size and quality fruit, thinning is important. It is possible to thin by hand and with chemicals. Before thinning an exact evaluation of the yearly blooming capacity is needed. Thinning is possible from the full pink stage of flowers up to fruit diameter of 20 mm. The best results are obtained if chemical thinning is followed by hand thinning.

Storage is best at 1°C (33.8°F). Optimum conditions for CA storage are 2.5% CO_2, 1.3% O_2, and 1.3°C (34.3°F). Pinova can be stored for 240 days without problems. At the end of storage the fruits have a firmness of 5.0 to 6.0 kg/cm^2.

We conclude that Pinova is one of the most productive cultivars with an excellent appearance and taste and a very good shelf life for the fresh market. The management is easy with slender spindle if pruning and thinning occur every year. It can grow in all regions without extreme temperatures. In dry regions it needs irrigation. Phytosanitary problems are small. The storability is excellent.

FIGURE 1

Productivity of the Pillnitz apple cultivars. Data are kg/tree, averaged for 10 years, relative to Golden Delicious (=100), with rootstocks M.9 and M.26 at Pillnitz.

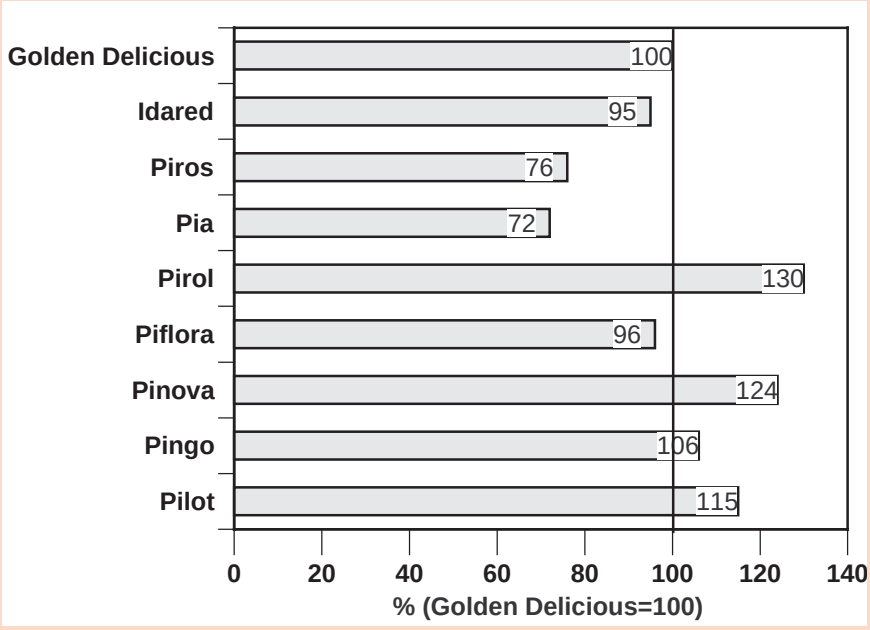

TABLE 1

Content of soluble solids (%), acidity (g/l) and Vitamin C (in brackets; mg/100 g) in various apple cultivars at eating maturity.

	Acidity (g/l)									
Soluble solids (%)	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.2**	**1.3**
18				Rubinette (4.0)						
17			Jonagold (3.8)	Delbard Jubilé (7.7)				Boskoop (6.0)		
16				Rubinola (7.7)				Pilot (21.9)		Cox Orange (13.6)
15					Regine (10.5)		Reanda (3.9) Pingo (18.3)		Remo (3.0)	
14	Liberty (2.0) Priscilla (5.8)	GD (2.1) Pinova (2.7)	Releika (11.7) Retina (1.0)	Piros (1.0) Otava (1.5)	Ecolette (10.5) Renora (2.7) Relinda (4.4) Piflora (2.7)	Rebella (7.7)				
13			Delorina (1.8) Florina (4.1) Freedom (0.9) Jonafree (12.0)	Elstar (4.1) Gloster (1.2) Reglindis (1.5) Resi (1.2)	Pia (1.1)	Topaz (5.1)	Rewena (3.5)			
12	Gala (1.1)									
11			Idared (5.5) Hana (1.1)							