selections. Annually since 1974, he sponsored variety showcases displaying as many as 260 apple, 100 peach and several pear, plum and nectarine samples, in cooperation with midwestern and southern researchers, growers, and extension persons. Characteristics and performance of promising selections and new cultivars growing under different environments were discussed by breeders and evaluators. Over 600 attended the 1983 showcase.

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New French Stone Fruit Rootstocks

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The climate of South-Western and South-Eastern France is favorable to the peach culture, however, the peach growers encounter some difficulties with different types of soil which can be more calcareous or more loamy, or too wet in winter for peach roots. Consequently, for many years the French peach growers use the following rootstocks for the peach: Almond seedlings in dry and calcareous soil, St. Julien seedling or Damas suckers in heavy soils. Since 1945 the "Institut National de la Recherche Agronomique" in the "Grande Ferrade Station" near Bordeaux had a breeding program to improve rootstocks for stone fruits and specially for the peach culture. Initiated by J. Souty, and followed by R. Bernhard, Ch. Grasselly, and G. Salesses, this work is carried on by different ways and specially by interspecific crosses. The first and the main result of this program was the selection of Peach x Almond hybrid G.F. 677 in 1960 which is currently propagated by 6 or 7 millions of cuttings each year in Italy, France and Spain.

For some years the new rootstocks have been proposed to nurserymen by the official system of CTIFL* which manage in France the controlled propagation of plant material. The objective of this note is to describe these new types with their genetic origin, their particularities about propagation and their behaviour in orchards after budding. Most of them are under test in U.S. universities and in an American private nursery** since 1980.

Peach x Almond G.F. 677

This very vigourous rootstock was used in France in the past only in calcareous and dry soils. For some years it was also used with success in well drained soils where several generations of peach had been grown and where "peach replant problems" occurred. This rootstock is also used for all Almond orchards for several years. G.F. 677 is propagated by different ways: softwood or semi-hard wood cuttings under mist and recently by micropropogation. For the greatest benefit of its characteristics, it is better to bud the cuttings in autumn

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**Hilltop nurseries which have exclusivity for INRA rootstocks in U.S.A.

(September); with June budding a loss of vigour and chlorosis resistance is observed. All Peach and Almond varieties can be budded on this rootstock and also the French prune; unfortunately G.F. 677 is susceptible to *Meloidogyne javanica* and *incognita* but with its great vigour it can give nice peach trees in soils infested by this last nematode. The main quality of the Peach x Almond is its ability to tolerate water logging conditions. Its level of tolerance is nearly comparable with peach roots.

Myran^{R}-(F1 P.322 x S.1058)

This rootstock is issued of a Myrobolan x Peach hybrid from a cross of 'Belsiana' plum and 'Yunnan' peach by R. Bernhard in 1950. This vigourous hybrid can be budded with all Peach and Almond varieties. It doesn't give suckers. It is propagated by hardwood cuttings in winter with a good rootability or in summer by softwood cuttings or yet by semihardwood cuttings in autumn. From its 'Yunnan' Peach parent this rootstock is tolerant to root knot nematode, from its other parent it also is resistant to water logging. The main defect of Myran is its susceptibility in calcareous soils to chlorosis, and may have in very rich soil conditions a tendency to slightly reduce yield efficiency. This rootstock should be interesting in the soil and climatic conditions with rainy summers and acid soils.

Ishtara^{R}-F1 P.322 x P 871

Hybrid from the Bordeaux Station in 1950 from a cross of 'Belsiana' plum and a natural Plum x Peach hybrid. This very upright and non-branched tree is vigourous and female sterile. It is easily propagated by hardwood cuttings. This rootstock can be used for all stone fruit species: Apricot, Almond, Plum and Peach. Tree characteristics in the orchard are medium vigour, high yield efficiency, and susceptibility to water logging is of the same level as peach roots. In some conditions, some weak anchorages were observed with peach but not with other species. In France "Ishtara" has been tested for twenty years as a rootstock for plum and for French prune. With French prune it gives very high yields and good fruit size. For Peach species it has been tested since 1975 in soils infected by oak root fungus. In these conditions it shows a good tolerance to this fungus. Budded with apricot, "Ishtara" shows good compatibility with varieties which generally are incompatible on Myrobolan plum rootstocks.

G.F. 43

This relatively old rootstock was selected in 1950. It is an open seedling of French prune chosen as a rootstock for peach. It is propagated by hardwood cuttings with a medium rootability (40 per cent). G.F. 43 has a relative slow growth during the first two years, then it gives a very big development like the peach roots. It is the biggest of the plum rootstocks for peach. In France G.F. 43 is appreciated as a rootstock with normal density 5 x 6 meters but is not adapted to high densities because of its low yield efficiency during the first years. The roots of G.F. 43 have a good resistance to chorosis. In water logging conditions its behaviour is better than the peach rootstock but lower than some plums.

Mirabi^{R}-P. 2032

This plum is a chance seedling of Myrobalan observed for its compatibility with Peach. It was discovered in 1957 used to obtain a Myrobalan clonal rootstock for the peach. Effectively the Myrobalan root has very good adaptability to different types of soil and good tolerance to several soils parasitic problems. French rootstock breeders think that this selection is a good Myrobalan for the peach and may be adaptable to many soil condi-

tions. The first buddings were made with 'Redhaven' peach and 'Armking' nectarine in 1967 and additional varieties later. Tree growth in the orchard was very satisfactory and fruit production was normal. Since 1975 some problems of slight incompatibility were observed with some varieties like 'Summergrand.' Meanwhile, in waiting for new Myrobalan clones which are under selection, "Mirabi" clone can be used with success with most of the peach and nectarine varieties.

Sandra^{R} (Saint Julien x Pershore)

This plum, hybrid of 'Saint Julien' x 'Pershore' is a vigourous rootstock for peaches and nectarines. It doesn't sucker. The mother tree is upright with big shoots and large leaves. Propagation can be by hardwood cuttings but the rootability is only of 30 to 40 per cent. 'Sandra' can be easily propagated in vitro. It is slightly susceptible to high pH and lime soils. its main qualities are the non suckering and the good vigour given to the peach varieties.

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