



DIPARTIMENTO DI
PRODUZIONE VEGETALE



DIPARTIMENTO DI
COLTURE ARBOREE



MASPes breeding program

OBJECTIVES , METHODOLOGY AND FIRST RESULTS



MASPeS: an apricot and peach breeding program

MAS.PES program is ongoing in the south-eastern Po Valley (Italy), with the support of both public and private funds, including growers organizations. The program is aimed at the introduction of new cultivars adapted to the climatic conditions of the region and addressing disease resistance and outstanding fruit quality traits. Other than traditional breeding procedure, tools for marker-assisted selection are being developed taking advantage of the peach genome sequence and innovative marker platforms, even if marker identification has not been completed so far.

The breeding operations are rather standard and based on manual emasculation and pollination, seedlings establishment, and field selection carried on for horticultural, pomological and some commercial traits. Parents are chosen within the germplasm collection or from other, often foreign, programs. Once the seedlings begin fruiting (usually at the third leaf), the selected trees are grafted and further evaluated under test trials in comparison with commercial cultivars. The most promising selections are then subjected to more extensive trials under a non propagation agreement in private orchards. The whole process is subjected to strict observation of the virus-free status of the trees, from the choice of the parents up to the release of a new cultivar, under the supervision of the local public Plant Health Service. Selected segregating progenies are also assessed for inheritance studies, particularly for fruit quality traits and disease resistance. A trained panel of 18 tasters is employed to assess flavour and taste of the most promising selections, by the





following quantitative descriptors: odour intensity (on cut fruit, off-flavours included), sweetness and acidity and their balance, bitter, astringency, aroma, juiciness, firmness. Finally, the panellists are asked to express their hedonistic appreciation in terms of odour, flavour, texture (as a result of firmness, juiciness, and mealiness) pleasantness, other than an overall quality evaluation. The score range is 1 to 9 for all descriptors.

The breeding stock for apricot and peach is made up of about 20,000 seedlings and around one hundred advanced selections, other than more than 500 accessions from a germplasm bank including commercial and local cultivars, other than landraces. Latest introductions have been the early ripening yellow flesh peaches ‘Pulchra*’ and ‘Bordò*’, as well as five yellow nectarines: ‘Rebus028*’, ‘Rebus038*’, ‘Rebus195*’, ‘Dulcis®’ and ‘Dulciva®’. Apricot cultivars patented in recent years are ‘Bora®’, ‘Gemma®’, ‘Pieve*’ and ‘Petra®’.



'Bora[®]' was issued in 1990 from the cross 'Early Blush' (NJ A53) x 'PA 7005-2' ('Rival' x 'PA 63-265'), in Imola (Bologna, northern Italy), and initially selected as 'BO 90610010'. The tree has a standard-slightly upright growth habit, vigorous, early bearing. Bloom is rather abundant, in the early season; the yield is fair to good; Bora[®] is not fully self-fertile, but does not require pollinators; compatible cultivars are 'Sweetcot', 'Portici' and 'Early Blush'.



The fruit starts to ripe in the first week of June (northern Italy), two weeks before Kioto*; it is of large size (80-90g), oblong and slightly asymmetrical; skin is orange without significant blush; flesh is orange, melting and slow softening, thus with a very good keeping ability both on tree and on shelf, juicy and of good flavour, with acidic skin; stone is free to the flesh. Very interesting cultivar for the early market (season of 'Early of Tiryntos'), it is field resistant to Sharka virus (PPV), both Dideron and Marcus isolates. **It detects molecular markers for genetic resistance to "Sharka" (Plum Pox Virus).**



'Gemma®' was issued in 2003 from the cross 'BO 92639060' x 'Orange Red', in Imola (Bologna, northern Italy), and initially selected as 'BO 03608022'. The tree has a standard-open growth type, highly vigorous, early bearing. Bloom is rather abundant, in the late season; the yield is high, due to complete self fertility.

The fruit starts to ripen in the third week of June (northern Italy), 4 days before Kyoto*, it is of medium-large

size (70g), ovate-elliptic and slightly asymmetrical; skin is orange with 30-40% of bright red blush; flesh is orange, melting and slow softening, thus with a very good keeping ability both on tree and on shelf, juicy and of good flavour, sweet with low acidity; stone is free to the flesh. Gemma® is an excellent flavour, medium ripening season apricot.





'Pieve*' was issued in 1989 from the cross 'Harcot' x 'Reale d'Imola', in Imola (Bologna, northern Italy), and initially selected as 'BO 89608015'. The tree has an upright growth type, vigorous, early bearing. Bloom is rather abundant, in the late season; the yield is high, due to complete self fertility.

The fruit starts to ripe at the end of June-beginning of July (northern Italy), 3 days after Kioto*, it is of medium-large size (70g), round slightly oblong and symmetrical; skin is orange with 30-40% of bright red blush; flesh is orange, melting, juicy and of good flavour,

sweet with low acidity; stone is free to the flesh. Pieve* is an excellent flavour, medium ripening season apricot.





'Petra®' was issued in 1988 from the cross 'Goldrich' x 'Pelese di Giovanniello', in Imola (Bologna, northern Italy), and initially selected as 'BO 88617102'. The tree has a standard-open growth type, medium vigorous, early bearing. Bloom is rather abundant, in the middle-late season; the yield is very high, due to complete self fertility.



The fruit starts to ripen in the first week of July (northern Italy), it is of medium-large size (65-70g), oblong-round and slightly asymmetrical; skin is orange without significant blush; flesh is orange, melting and slow softening, thus with a very good keeping ability both on tree and on shelf, juicy and of good flavour, sweet with low acidity; stone is free to the flesh. Petra is an excellent flavour, late ripening apricot, adapted both for fresh market and industrial processing.

It detects molecular markers for genetic resistance to "Sharka" (Plum Pox Virus).

Pulchra peach



'Pulchra' was issued in 2002 from the cross 'Vistarich' x 'Maycrest', both yellow peaches, in Imola (Bologna, northern Italy) and initially selected as 'BO 02037004'. The tree has a standard growth type and it is rather vigorous, and needs summer pruning in order to keep a balanced canopy, as it has a tendency to show bare wood. The flower is showy and the bloom is rather abundant, in the middle season; the yield is very high and needs adequate thinning. The leaf is of normal size, with reniform glands.

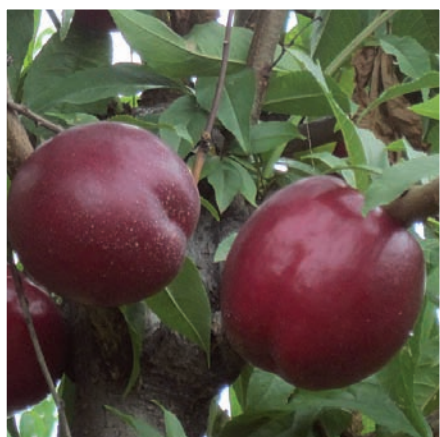


The fruit starts to ripe in the first week of June (northern Italy), 4-5 days ahead of 'Maycrest' yellow peach, it is of medium size for its season (over 100g), perfectly round, but may show a protruding apex after warm Springs; skin is yellow with over 80-90% of a very attractive red blush, with stripes and dots; flesh is yellow, with scarce red, melting, firm and with good keeping ability on tree, juicy, very flavoured and aromatic; the pit, of medium size, is adherent to the flesh.

Rebus 028 nectarine*



'Rebus 028*' was issued in 1996 from the cross 'Big Top®' x 'May Fire', both yellow nectarines, in Imola (Bologna, northern Italy) and initially selected as 'BO 96003028'. The tree has a standard-upright growth habit, it is rather vigorous, and needs summer pruning in order to keep a balanced canopy. The flower is showy and the bloom is rather abundant, in the middle season; the yield is very high and needs adequate thinning. The leaf is of normal size, with reniform glands.



The fruit starts to ripe in the middle of June (northern Italy), 20 days before Big Top®, it is of good size for early season (150-170g), perfectly round; skin is yellow with over 90% of a very attractive red blush; flesh is yellow, with scarce red, melting, firm and with good keeping ability on tree, juicy, very flavoured and aromatic, with low acidity; the pit, of medium size, is adherent to the flesh.

'Dulcis[®] BO 02024028*' nectarine



'Dulcis[®]' was issued in 2002 from the cross 'Max 7' x 'Big Top[®]', both yellow nectarines, in Imola (Bologna, northern Italy) and initially selected as 'BO 02024028'. The tree has a standard growth type, rather vigorous, early bearing. The flower is showy and the bloom is rather abundant, in the mid-early season; the yield is high. The leaf is of normal size, with reniform glands.



The fruit starts to ripe in the middle of August (northern Italy), 35 days after Big Top[®]; it is of large size (over 200g), round and slightly asymmetrical; skin is yellow with a 80% of red blush, tolerant to 'streaking' eventually caused by rain; flesh is yellow, with some red close to the pit, melting and slow softening like the seed parent, thus with a very good keeping ability both on tree and on shelf, very juicy and of good flavour, sweet and medium-low acid; stone is of medium size, adherent to the flesh.

'Dulciva'® BO 02002015*' nectarine



'Dulciva' was issued in 2002 from the cross 'Big Top'® x 'Ambra*', both yellow nectarines, in Imola (Bologna, northern Italy) and initially selected as 'BO 02002015'. The tree has a standard growth type, slightly upright and rather vigorous, early bearing. The flower is showy and the bloom is rather abundant, in the middle season; the yield is high. The leaf is of normal size, with reniform glands.



The fruit starts to ripe in the first week of September (northern Italy), it is of large size (over 200g), round and slightly asymmetrical; skin is yellow with a 60-70% of red blush, with some stripes and dots, tolerant to 'streaking' eventually caused by rain; flesh is yellow, with some red close to the pit, melting and slow softening like the seed parent, thus with a very good keeping ability both on tree and on shelf, very juicy and of good flavour, sweet and medium-low acid; stone is of medium size, adherent to the flesh.

