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'China Pearl' Peach

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'China Pearl' is a high chilling (1100-1200 chill units), late flowering, white flesh peach [*Prunus persica* (L.) Batsch] with high flower bud cold hardiness during dormancy and bloom. It is expected to be adapted to areas where 'Contender' has been grown successfully. Trees have small, reniform leaf glands, and large, showy flowers and produce large, attractive fruit with low flesh acidity. Fruit show 70% attractive red color over a cream-green ground color. Fruit ripen in early August in south central North Carolina, about 14 days after 'Contender'. Fruit flesh is melting and freestone.

'China Pearl' was selected at Jackson Springs, NC in 1991 by D. J. Werner and S. M. Worthington. It originated from the 1988 cross of 'Contender' x PI 134401. 'Contender is a high quality, yellow flesh peach released by the North Carolina Agricultural Research Service in 1987 (2). PI 134401 is a low acid, white flesh plant introduction that was derived as a seedling from PI 80089, introduced into the United States from China in 1929 (3). Seedling progeny from this cross were grown and evaluated at Jackson Springs, NC. After initial seedling selection, 'China Pearl' was asexually propagated on 'Lovell' rootstock and put in an advanced selection trial at Jackson Springs, NC and at a grower in Candor, NC.

'China Pearl' ripens about August 1 in south central North Carolina (Table 1), about 14 days after 'Contender'. 'China Pearl' blooms after 'Contender'; the chilling requirement to satisfy flower bud endodormancy is about 1100-1200 hours below 4°C. this high chilling requirement is the basis for the late flowering of 'China Pearl'. Late flowering reduces the risk of freeze injury to flower buds in late winter and early spring. In addition to its late flowering, flower buds of "China Pearl' also possess high levels of resistance to cold temperature. Resistance to cold temperature was confirmed in Spring 1996; trees of 'China Pearl' still had live flower buds even after exposure to 6 consecutive subfreezing nights at 50% bloom (Table 2). Flower buds of all commercial check cultivars in the same test block, except 'Challenger' and 'Intrepid', had no live flower buds. Trees of 'China Pearl' subsequently fruited that year. No fruit was produced on any other commercial cultivar except for 'Challenger' and 'Intrepid'.

Fruit of 'China Pearl' are very large (Table 1), with many fruit commonly exceeding three inches in diameter (7.6 cm) when properly thinned, typically averag-

Table 1. Average ripening date and fruit characteristics of 'China Pearl' peach and other commercial cultivars at Jackson Springs, NC (1994-1997).

Cultivar	Ripe date[z]	Fruit diameter (cm)	Fruit suture[y]	Fruit pubescence[y]	External color (%)	Flesh color[y]	Fruit firmness[y]
China Pearl	213	7.1	3.8	4.3	70	3.8	3.8
Challenger	182	6.4	4.0	4.3	79	3.8	3.5
Intrepid	188	6.6	3.8	4.0	58	3.8	3.5
Biscoe	207	6.6	3.0	3.3	57	4.3	3.6
Contender	199	6.9	3.7	4.7	73	4.3	4.3
Legend	224	6.4	3.5	4.0	55	3.5	4.5

[z]Julian date.
[y]Ratings based on a scale of 1-5: 1 = poor, 3 = good, 5 - excellent.

Table 2. Flower bud cold hardiness rating of 'China Pearl' and other peach cultivars after exposure during dormancy to -16°C on 2-9-96, and exposure at about 50% bloom to minimum temperatures of -3.3°C, -9.4°C, -7,7°C, -5°C, -3.3°C, and -1.6°C on consecutive nights between March 9 and March 14, 1996, respectively.

Cultivar	Flower bud hardiness rating[z]
China Pearl	3
Challenger	1
Intrepid	2
Biscoe	0
Contender	0
Encore	0
Legend	0

[z]Rated on a scale of 1-5 with 1 = sufficient live buds for 20% crop, 2 = sufficient live buds for 20-40% crop, 3 = sufficient live buds for 40-60% crop, 4 = sufficient live buds for 60-80% crop, and 5 = sufficient live buds for full (100%) crop. Data taken March 20, 1996 at Jackson Springs, NC.

ing 6.9 ounces (195.6 grams) per fruit. Because of its moderate to high flower bud density (# flower buds/node), heavy thinning of 'China Pearl' will be required in years of little natural fruit thinning from freeze events. Fruit of 'China Pearl' have shown acceptable performance for fruit suture, fruit pubescence, fruit skin color (Royal Horticulture Society Chart (RHS) 41C to 42A), fruit flesh color (RHS 157C), and fruit firmness (Table 1). Fruit are round and have shown little tendency to produce a tip over the four years of evaluation. However, it is expected that fruit shape would suffer in more southerly growing areas of the U. S.

Table 3. Rating of appearance and flavor, and acceptance of 'China Pearl' fruit by different ethnic groups.

	Ethnic Group[z]	
Character[y]	Caucasian	Asian
Appearance	8.4	8.6
Flavor	5.7	7.5
Preference	40%	73%

[z]Sample sizes of Caucasian and Asian tester groups were 43 and 26, respectively.

[y]Appearance and flavor rated by Testers on a scale of 1-10, with 1 = very poor, 3 = fair, 5 = good, 7 = very good, and 10 = excellent. Preference represents the percentage of Testers who stated they preferred this fruit to standard fresh peaches they typically consume.

'China Pearl' fruit are white fleshed and show little to no red flesh pigmentation. The flesh is very resistant to oxidative browning on bruised or cut surfaces. 'China Pearl' is heterozygous for the honey (*D*) gene, which confers a reduction in total malic acid content in the fruit flesh. Consequently, fruit of 'China Pearl' show reduced levels of malic acid. Measurements of titratable acidity, expressed as % malic acid equivalents, of flesh of mature fruit showed values of 0.27 and 0.71 for 'China Pearl' and 'Contender', respectively. The fruit flavor is very mild, often perceived as being sweeter, however, fruit sugar levels are similar to other standard commercial cultivars. The low-acid flavor is not preferred by many Caucasians, but appears to be preferred by those of Asian and Hispanic descent (Table 3).

Foliage of 'China Pearl' is moderately susceptible to bacterial spot disease incited by *Xanthomonas campestris* pv. *purni* Table 4). Fruit have shown some evidence of infection in years of heavy disease pressure. Moderate levels of infection shown by this selection may necessitate pesticide application in years of heavy disease pressure.Trees of 'China Pearl' show a growth

Table 4. Mean bacterial spot (*Xanthomonas campestris* pv. *pruni*) resistance as measured by percent defoliation for 'China Pearl' and other peach cultivars for years 1995-1997 at Jackson Springs, NC.

Selection	% defoliation[z]
Challenger	18.3
Intrepid	15.0
China Pearl	28.3
Boscoe	15.0
Contender	13.3
Encore	43.3
O'Henry	70.0
Legend	26.6

[z]Data shown represents % leaf defoliation. Data taken August 15 - August 30.

rate typical of most commercial cultivars, however, tree growth habit is more upright than standard cultivars. Flowers are dark pink (RHS 65C) and showy. Pollen is abundant. Leaf glands are small and reniform.

'China Pearl' will provide growers with a consistent cropping, late ripening cultivar that will provide new specialty marketing opportunities. Market targeting of Asian and Hispanic communities should be feasible with this cultivar. Its late flowering, high flower bud density, and cold hardiness that exceeds that of currently grown commercial cultivars should make it an appropriate choice for peach growers in many production areas, particularly in areas where peach culture is tenuous due to the prevalence of cold injury to flower buds. 'China Pearl' will also be valuable for commercial production in other peach growing regions of the U. S. where winters are cold enough to satisfy its high chilling requirement.

An additional unique aspect of 'China Pearl' is that it is one of the few commercial cultivars of peach developed for the eastern U. S. that was derived in part from germplasm outside the 'Chinese Cling' genetic base. Most of eastern U. S. commercial peach cultivars trace back exclusively to 'Chinese Cling' (1). PI 134401, one of the parents of 'China Pearl', is not descended from 'Chinese Cling'. Thus, this cultivar will serve to broaden the genetic base of commercial peach production in the U. S., and it will serve as an important source of germplasm for breeders elsewhere. The name 'China Pearl' was chosen because of its white-fleshed fruit and its direct descent from a Chinese plant introduction.

A plant patent has been filed for 'China Pearl', and a propagation agreement is available through the North Carolina Agricultural Research Service, P. O. Box 7601, Raleigh, NC 37695. Budwood is indexed free of Prunus plum pox virus.

Literature Cited

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Fumigation of Strawberry

Yield of five strawberry cultivars grown in non-fumigated soil produced 54% (year 1) and 68% (year 2) less yield than plants from fumigated plots. Fruit size was also lower in the non-fumigated plots. This study shows that loss of materials to fumigate soils will have a large impact on Florida strawberry production. From Chandler et al 2001 Hort Technology 11(1):69-71.

Pecan Production

Pecan production in the U.S. is from 10.2 million trees with 15% of those non-bearing. Of the 492,000 acres 34% are in Texas, 27% in Georgia and 17% in Oklahoma dispersed among 19,900 farms. Changing trends in the industry include: fewer small farms, fewer non-bearing trees, decrease in the southeast and increase in the more northerly area of the production range. The carry over supply of pecans, current crop and the price of walnuts accounts for 80% of the variation in price of pecans. From Wood 2001 Hort Technology 11(1):110-118.