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Plum [Prunus salicina Lindl. (syn. Prunus triloba Roxb. or Prunus thibetica Franch.)], commonly known as chinese plum or japanese plum, is a diploid (2n = 2x = 16) fruit tree native to China. It is one of the most important stone fruit crops in the world (Bhutani and Joshi, 1995). The total world production of plums was 10,776,232 t in 2009, of which 5,372,899 were produced in China (Potter, 2012). China also has rich plum germplasm resources, which are attributed to a long history of natural and artificial selections for fruit yield and quality as well as for adaptation to a wide range of ecological conditions (Liu et al., 2007). ‘Naili’ and ‘Furongli’ are two groups of famous landraces in Fujian Province (Zhang and Zhou, 1998), located on the southeast coast of China. ‘Naili’ was described in ancient Chinese books as ‘Ba Min (Zhang et al., 1993), with smooth bark, sometimes having downy white spots. The bearing area of ‘Crown’ ranges from 1.7 to 2.0 cm. The ratio of edible fruits is 98%, similar to ‘Qing Nai’ and ‘Hua Nai’. ‘Crown’ is an early-maturing cultivar. Stone hardens around 11 May. The harvest season for the fruits is late May or early June in Fujian, which is 5 to 6 weeks earlier than ‘Qing Nai’ and ≈8 weeks earlier than ‘Hua Nai’. Ripened ‘Crown’ fruits can remain on the trees for up to 3 weeks. The fruit skin had extremely low cracking rate compared with the medium cracking rate of ‘Qing Nai’ and the high rate of ‘Hua Nai’. Based on the University of California firmness penetrometer (Valero et al., 2007), the fruit firmness of ‘Crown’ was 26.8 ± 4.5 N, but the firmness of ‘Qing Nai’ and ‘Hua Nai’ were 32.5 ± 5.8 and 29.5 ± 4.2 N (Table 2), respectively. Our laboratory testing of numerous ‘Crown’ plum fruit samples harvested from multiple sites over a 5-year
period showed fruit nutritional values as follows: total soluble solids: 15.1 ± 0.5 °Brix; total carbohydrate content: 10.80%; monosaccharides: 6.40%; disaccharide: 4.30%; titratable acidity: 0.83 ± 0.1 g/100 mL, which was mediated by malic acid; and the average juice pH: 3.15. The values were not significantly different over the years or locations (Chen et al., unpublished data).

On the other hand, total soluble solids of ‘Qing Nai’ and ‘Hua Nai’ were 12.7 ± 0.4 and 11.4 ± 0.3 °Brix, and titratable acidity for the two are 0.92 ± 0.2 and 1.04 ± 0.3 g/100 mL (Table 2), respectively. ‘Crown’ can be stored up to 25 d at 25 °C (Fig. 1F) without deterioration. The fruit maintains its firmness and juiciness under standard cold storage conditions (0 to 1 °C) for 7 months.
Culture and Performance

Rooting of cuttings is possible but bud grafting is the primary method for propagating ‘Crown’. It can be easily propagated by the T-budding onto Amygdalus davidiana (Carriere) Franch. rootstocks and P. salicina as intermediate stocks such as ‘Qing Nai’, ‘Furongli’, ‘Wickson’, and ‘Black amber’. However, we failed to graft it onto Prunus mume, which could be due to the incompatibility between the two species.

‘Crown’ can grow in soils from clay to light sandy soils, but best performance occurs in loam and sandy loam with good drainage. It grows well in a soil pH ranging from 5.5 to 7.5. Established grafted plants are generally planted 4 m apart. For tree at the sapling stage, each tree needs to be fertilized with 0.1 kg of 10N–10P2O5–10K2O in April; additional application of 0.2 kg of the fertilizer in August; and 0.2 kg of the fertilizer with 10 kg manure after defoliation. For mature trees, each needs 50 g of urea and 50 g potassium sulfate in early March, and 0.3 kg of 10N–10P2O5–10K2O fertilizer or 0.5 kg of fused calcium magnesium phosphate fertilizer in early May. After defoliation, application of 20 kg of manure is recommended.

Common pest problems in plum production include aphids and oriental fruit fly Bactrocera dorsalis (Hendel). In addition, leaf curl (Taphrina deformans), powdery mildew (Sphaeroteca pannosa), and shot hole (Wilsonomyces carpophilus) also occur. Integrated pest management practices have been recommended to control pest problems, including cleanup of orchard in winter, timely pruning or burning of infested branches, leaves, and small trees, and spraying of lime sulfur. The oriental fruit moth can be prevented using frequency vibration insecticidal lamps.

Two important traits separate ‘Crown’ from the other cultivars. The first is the early maturation. Since fruits are harvested before 10 June, the early harvesting naturally avoids attacks of the oriental fruit fly. Oriental fruit flies oviposit on fruit. Larvae damage fruit and other organs of plants. Larvae damage also causes fungal or bacterial infection. This fly can be responsible for up to 65% loss in ‘Wickson’ and other plum cultivars. The earlier maturation also avoids fruit drop and damage caused by tropical cyclones during the typhoon season from the end of June to September in Fujian coast. In addition, ‘Crown’ has no longitudinal dehiscent problem, which significantly enhances its marketability.

‘Crown’ is highly productive in Fujian. The average yield is 9 kg for 3-year-old trees and 30 kg for 5-year-old trees. The tendency for biennial bearing was not observed.

Availability

Small numbers of rooted cuttings or budwood can be obtained from Prof. Dr. Faxing Chen at the College of Horticulture, Fujian Agriculture and Forestry University, Fuzhou, China.

Literature Cited


