'Hanhong' Pear

Maojun Zhang, Lihua Ding, Qiang Wang, and Meiqi Feng

Pomology Institute Academy of Agriculture Science of Jilin Province, Gongzhuling, 136100, China

Shahrokh Khanizadeh*

Agriculture and Agri-Food Canada, Horticultural Research and Development Centre, 430 Gouin Boulevard, St-Jean-sur-Richelieu, QC, Canada, J3B 3E6

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Abstract. 'Hanhong' (*Pyrus ussuriensis* Maxim × *P. bretschneideri* Rehd.) is a new high-quality Asian pear with excellent firmness and crispness and a long shelf life. Fruit of 'Hanhong' are very attractive and the tree is very winter-hardy. The fruit and leaves are resistant to pear scab (*Venturia pirina* Aderh) and black spot (*Alternaria kikuchiana* Tannka) disease.

'Hanhong', tested as 86-1-32, is a progeny resulting from a cross between 'Nanguoli' (*Pyrus ussuriensis* Maxim.) × 'Jinsu' (*Pyrus bretschneideri* Rehd.) made in 1986 (Fig. 1) at the Pomology Institute Academy of Agriculture Science of Jilin Province and was released in 2003 by one of the authors (MZ).

The name 'Hanhong' makes reference to two characteristics: "very hardy and red skin colour on the surface exposed to the sun." 'Nanguoli' is a chance seedling cultivated in Liaoning province; it is a very popular variety in northeastern China (Zhang, 2002). 'Jinsu' was selected from a cross between Yali (*P. bretschneideri* Rehd.) × Jinli (*P. bretschneideri* Rehd.) and was released in 1972 by the Pomology Institute Academy of Agriculture Science of Shanxi Province. Compared with its parents, 'Hanhong' has better eating qualities and retains its fresh quality longer in storage. 'Hanhong' is also resistant to pear scab (*Venturia pirina* Aderh) and black spot (*Alternaria kikuchiana* Tannka) disease.

'Hanhong', tested in Jilin province, which is located in the central part of northeastern China (longitude 121°38'E to 131°19'E; latitude 40°52'N to 46°19'N), the northern most section of the temperate zone of China, nearing the subfrigid zone, has a temperate continental monsoon climate with four distinct seasons. The absolute minimum winter temperatures that normally occur in January are between -30 °C and -35 °C, but it can drop to as low as -45 °C in extreme years with little snow cover. Precipitation occurs regularly over the course of the summer and the test plots received little to no irrigation during the evaluation period.

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*To whom reprint requests should be addressed; e-mail khanizadehs@agr.gc.ca.

Description

Tree. 'Hanhong' trees are vigorous with an upright-spreading habit and they are very winter-hardy. One-year-old shoots grow rapidly and can reach an average length that ranges from 0.7 m to 1.5 m; they are yellowish brown but turn to dark brown in the second year. The vegetative buds are medium in size and oblique.

Leaves. The leaves are ovate; apex is acuminate and round at the base, 10.5 cm long and 6.3 cm wide, and margins are setose-serrate. The young leaves are glabrous, green, and somewhat dull. Time of leaf fall occurs in mid-October.

Flower. Flowering starts in early May at the same time as 'Pingguoli', before 'Hanxiangli' and after 'Nanguoli'. The flower buds are light pink becoming white in full balloon stage, flowers have three to five light yellow green stigmas with 20 to 31 stamens, anthers are purplish red, rich in pollen, and the pistils are the same height as the stamens. Inflorescences are composed of seven to eight flowers and chromosome number is $2n = 2x = 34$.

Fruit. The fruit buds are borne on spurs and twigs (shoots) that are generally 1 to 3 years of age, and the fruiting zone tends to move away from the trunk to the outside of the tree. The trees start producing fruit 4 to

Fig. 2. Fruit of 'Hanhong' pear.

5 years after grafting on 'Shanli' rootstock (a wild species of *Pyrus ussuriensis* Maxim.) and require cross-pollination.

Fruit ripen in late September and need ≈135 to 140 frost free days to reach maturity in Jilin Province. Fruit are round (Fig. 2) and the skin has a bright red blush over a clear yellow ground color at maturity. There is little russeting around the eye basin and stem cavity (Fig. 2); lenticels are conspicuous, medium in size, and evenly distributed; the stem is medium to long in length, small to medium in diameter, and is green, although a brownish color can be seen on some fruit. The stem cavity is fairly shallow and width is narrow to medium; the basin is slightly ribbed with a medium depth and width.

The average fruit weight is 230 g and the flesh is white, fine, crisp, and juicy, subacid, sweet, very flavorful, and there are few grit cells. In a normal year (when seasonal temperatures are normal), brix values are 14% to 16%, total sugar 7.863%, titratable acidity content 0.897%, and vitamin C content 119.7 μg·g⁻¹. Fruit firmness is 7.9 kg/cm² at maturity and remain firm 6.8 kg/cm² after 3 months of storage in a common cellar (4 °C) and crisp after 5 months of storage. Compared with its parents, this new cultivar has better eating qualities and retains its fresh eating quality longer in storage.

Diseases. The leaves, flower, and fruit are resistant to pear scab and black spot.

Availability

An application was made to protect 'Hanhong' nationally. Limited quantities of nonindexed budwood are available for research purposes from the author (Zhang) after signing a nonpropagation agreement. Nurseries can obtain a multiplication license from Meiosis Inc. (Bradbourne House, Stable Block, East Mallings, Kent ME19 6DZ).

Literature Cited

Zhang, M. 2002. The advancement of pear breeding in recent twenty years in China. *Acta Hort.* 587:157-166.

Fig. 1. Pedigree of 'Hanhong' pear.