

# ‘Jizaohong’—An Early-Ripening Apricot Cultivar

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The collection and evaluation of apricot germplasm resources commenced in 1981 at Shijiazhuang Institute of Pomology, Hebei Academy of Agriculture and Forestry Sciences (SIP-HAAFS; Shijiazhuang, Hebei Province, China), resulting in identification of 224 germplasm resources by 1990. Through the careful selection of fresh edible varieties such as ‘Erhong’, ‘Zihe’, ‘Chuangzhihong’, and ‘Ganyu’ (Zhao et al. 2003), a number of excellent varieties were subsequently selected. Cross-breeding for practical seed selection was initiated in 1990, with early fruit ripening, high yield, disease resistance (scab, bacterial spot, etc.), and fruit quality (large size, sweet-and-sour taste, firmness) as breeding goals. As a result, the following six cultivars were successively selected, all of which have since been grown in northern parts of China: Jiguang (Zhao et al. 2002), Shuoguang (Zhao et al. 2009), Jinxiu (Zhao et al. 2015), Jinhui (Wu et al. 2022), Jinyu, and Jinhe (Wu et al. 2021).

## Origin

The apricot ‘Jizaohong’ was bred through an artificial cross between ‘Chuanzhihong’ and ‘Fengyuanhong’ at SIP-HAAFS in 2010 (Fig. 1). The average annual temperature is 13.4 to 15.8 °C, and the amount of annual accumulated temperature is 4561.2 to 4670.3 °C ( $\geq 10^\circ\text{C}$ ) in 2010 to 2020. ‘Chuanzhihong’ originated from Hebei Province and has been cultivated in China for more than 300 years. Its fruit is ovate, with an average weight of  $52.5 \pm 2.4$  g. The apricot skin is orange with tinges of deep-red covering much of the surface; its flesh is orange and has a soluble solids content of  $12.7 \pm 2.5\%$ . ‘Chuanzhihong’ is a freestone cultivar with a bitter kernel and is considered an excellent variety for both fresh consumption and processing. It is widely cultivated in Xingtai

and Baoding City in Hebei Province, as well as in Beijing, Shandong, Shanxi, Henan, Liaoning, Gansu, and Heilongjiang provinces. ‘Fengyuanhong’ is a very early-ripening cultivar that was bred by the Apricot and Fruit Research Institute in Xi’an, Shaanxi Province. Its fruit is ovate, with an average weight of  $60.0 \pm 4.4$  g (Table 1). The ground color of skin is orange and with 1/2 red of surface color, while its flesh is orange and extremely juicy, with a soluble solids content of  $11.4 \pm 1.2\%$ . Its kernel is sweet. Variety Z10-1-78 was selected as a result of this cross in 2013 and, in the same year, was grafted onto 4-year-old apricot rootstock. In 2015, regional tests were carried out with open pollination in Jvlu County, Xingtai City, Shijiazhuang City, Yutian County, and Tangshan City in Hebei Province, then the resulting accessions were grafted onto adult apricot trees, ‘Sungold’, ‘Fengyuanhong’, and ‘Chuangzhihong’ were used as control varieties. In 2021, accession Z10-1-78 was approved by the Approval Committee for Improved Varieties of Forest Trees of Hebei Province and subsequently named ‘Jizaohong’. We investigated and analyzed the fruit characteristics of ‘Jizaohong’ for 3 consecutive years from 2017 to 2019 (Table 2).

## Description

**Trees.** Trees of ‘Jizaohong’ have a high growth potential, with a rounded crown,

semicircular canopy, and a semiopen growth habit. The trunk of mature trees is taupe, while perennial branches are brown. Annual branches are strong, oblique, and have a smooth surface. They are of medium density, yellowish brown on the outer surface and greenish brown on the inner surface. The lenticels are transverse and small. The length-to-diameter ratio of the annual branches is 106: 9.26, while the average panel length is  $1.96 \pm 0.69$  cm. ‘Jizaohong’ continues to grow vegetatively for 220 d per year.

**Leaves.** The leaves of ‘Jizaohong’ are nearly rounded, dark green, glossy, and smooth. The angle of the blade tip is obtuse, while the leaf base is round. The leaf margin is rounded, with weak undulations and serrations. The average length and width of the leaves are  $9.6 \pm 0.7$  and  $8.3 \pm 0.9$  cm, respectively. The main veins are light green. The petiole is  $3.7 \pm 0.6$  cm in length and purplish red, with 2–3 nectaries. In Shijiazhuang, ‘Jizaohong’ begins developing leaf buds in late March to early April, with leaves beginning to expand in early April. The leaves begin to fall in late October to early November, with defoliation complete by mid-November.

**Flowers.** The diameter of ‘Jizaohong’ flower crown is  $2.3 \pm 0.4$  cm. Most flowers have five oval and pink petals with one or two pistils. The proportion of complete flowers is  $81.5 \pm 9.8\%$ . ‘Jizaohong’ is a self-incompatible cultivar and the self-pollination rate is zero. In Shijiazhuang, the floral buds break in late February, with the full bloom occurring in late March. The flowering period is 4–7 d.

**Fruit.** The fruit of ‘Jizaohong’ is round, with an average weight of  $63.5 \pm 3.3$  g and a maximum weight of 94.5 g. The average vertical, transverse, and lateral diameters of the fruit are  $4.86 \pm 0.08$ ,  $4.77 \pm 0.15$ , and  $4.92 \pm 0.12$  cm, respectively. The fruit has a round convex top, shallow but distinct sutures, and symmetrical flesh. The ground color of mature fruit skin is orange, with tinges of slice red on the outer surface. The skin is downy, with an attractive appearance (Fig. 2). The flesh is orange, low in fiber, of medium

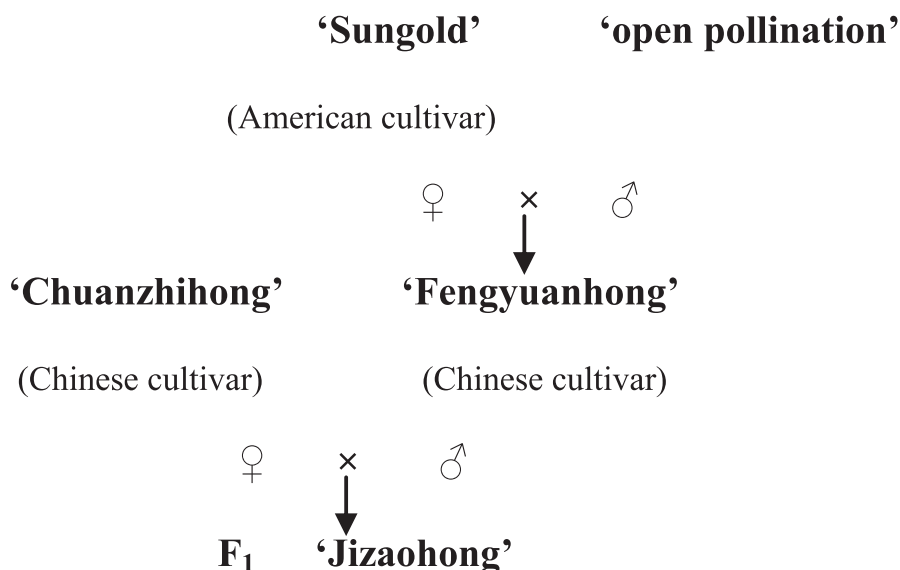


Fig. 1. Pedigrees of the new early-ripening apricot cultivar Jizaohong.

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Table 1. Important economic traits of the four cultivars of apricot in Shijiazhuang.

	'Jizaohong'	'Chuanzhong'	'Fengyuanhong'	'Sungold'
Ripening time (in 2019)	May 28	June 23	May 25	June 05
Fruit development period (d)	66.5 ± 1.3 b	90.0 ± 2.0 c	60.0 ± 1.0 a	68.0 ± 1.0 b
Fruit weight (g)	63.5 ± 3.3 b	52.5 ± 2.4 a	60.0 ± 4.4 b	59.3 ± 5.7 b
Flesh firmness (kgf·cm <sup>-2</sup> )	1.09 ± 0.2 a	1.47 ± 0.2 b	1.03 ± 0.3 a	1.37 ± 0.5 b
Soluble solids content (%)	13.7 ± 1.1 b	12.7 ± 2.5 ab	11.4 ± 1.2 a	12.4 ± 0.7 ab
Edible rate (%)	96.5 ± 0.6 a	96.0 ± 1.3 a	96.1 ± 0.4 a	96.0 ± 0.8 a
Fruit shape	Round	Ovate	Ovate	Round
Ground color	Orange	Orange	Yellow	Orange
Cover color	50% Red	75% Red-violet	50% Red	Mot
Aroma	Little	None	Little	None
Stone adherence to the flesh	Free	Semi-clinging	Free	Free
Kernel flavor	Sweet	Bitter	Sweet	Bitter

Note: Data represent the means ± SD. Different lowercase letters in each column indicate a significant difference between cultivars at  $P = 0.05$  level based Duncan's multiple range test.

Table 2. The economic traits of the 'Jizaohong' in Shijiazhuang.

Yr	2017	2018	2019
Fruit development period (d)	67.3 ± 1.3 a	68.3 ± 1.8 a	63.9 ± 1.0 b
Fruit weight (g)	57.5 ± 2.3 b	68.7 ± 3.5 a	64.2 ± 3.9 ab
Flesh firmness (kgf·cm <sup>-2</sup> )	1.00 ± 0.1 b	0.86 ± 0.2 b	1.42 ± 0.2 a
Soluble solids content (%)	13.5 ± 2.2 ab	12.0 ± 1.3 b	15.7 ± 1.1 a
Edible rate (%)	95.3 ± 0.6 b	96.8 ± 1.1 ab	97.3 ± 0.8 a
Fruit shape	Round	Round	Round
Ground color	Orange	Orange	Orange
Cover color	50% Red	50% Red	50% Red
Aroma	Little	Little	Little
Stone adherence to the flesh	Free	Free	Free
Kernel flavor	Sweet	Sweet	Sweet

Note: Data represent the means ± SD. Different lowercase letters in each column indicate a significant difference between cultivars at  $P = 0.05$  level based Duncan's multiple range test.

juiciness, and delicate in texture. The fruit has a soluble solids content of  $13.7\% \pm 1.1\%$ , a soluble sugar content of  $9.32 \pm 0.02$  mg/g, a titratable acid content of  $1.79 \pm 0.19\%$ , and a vitamin C content of  $6.25 \pm 0.02$  mg/100 g. Flesh hardness is  $1.09 \pm 0.2$  kgf·cm<sup>-2</sup> (Table 1). There is no browning or softening of the flesh near the stone. 'Jizaohong' is a freestone cultivar. Its stone is ovoid, smooth, and sweet in flavor, with an average weight of  $2.18 \pm 0.05$  g. The edible rate is  $96.5\% \pm 0.6\%$ . The fruit development period is 65–68 d in Shijiazhuang, and after harvest, it can be stored for 7–10 d at room temperature.

### Cultivation

'Jizaohong' is suitable for cultivation in Hebei Province and other areas with similar climatic conditions. It can be planted in plain, mountainous, and hilly regions with good drainage. Optimal row spacing is  $2.5-4 \times 3-6$  m. It is self-incompatible, and requires compatible trees for pollination, such as 'Jinhe', 'Luotuhuang', and 'Kate'. The tree can be established the central leader shape, the open center shape, or natural round shape. To improve fruit quality, fruit thinning should be carried out in time. Base fertilizer should be applied early after harvesting, at a rate of more than 70% of

the annual amount. The fruit development period is short. In addition to adequate nutrition in the early stages of growth, post-harvest fertilization is also required to ensure the normal differentiation of flower buds. Irrigation should be applied promptly after fertilization.

### Availability

'Jizaohong' has been approved by the Approval Committee for Improved Varieties of Forest Tree of Hebei Province (Nos. Hebei S-SV-AV-010-2020) (Fig. 3). Protection of



Fig. 2. The tree and fruit of the apricot cultivar 'Jizaohong'.

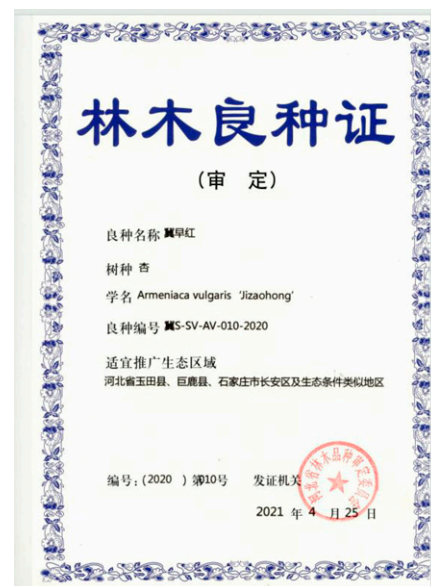


Fig. 3. The certificate of 'Jizaohong'.

Plant Breeders' Rights for 'Jizaohong' apricot has also been obtained in China until 2040 (Protection of New Varieties of Plants of the People's Republic of China; No. China 20200104). A limited quantity of bud wood is available on request for trial and research purposes as well as for commercial propagation.

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