

早熟硬肉优质杏新品种早红艳的选育

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摘 要: 早红艳是串枝红自然杂交种子经实生繁育选优培育而成的早熟硬肉杏新品种。果实卵圆形, 平均单果质量 71.7 g, 最大果质量 95.0 g; 果实较对称, 缝合线浅, 梗洼中深, 果顶圆凸, 有果顶尖, 果皮有茸毛, 中厚; 果实底色橙黄色, 阳面鲜红色, 有光泽。果肉橙黄色, 肉厚质细, 果肉硬, 纤维少, 味甜, 芳香浓郁。果核椭圆形, 褐色, 离核。核仁苦, 种仁较饱满。可溶性固形物含量(w, 后同)16.5%, 维生素C含量 8.69 mg·100 g⁻¹, 可食率 96.6%。新乡地区3月中旬开花, 5月下旬果实成熟, 11月中旬落叶。树体生长势强, 易成花, 以短果枝和花束状果枝结果为主, 自花结实能力差, 需配置授粉树。早红艳外观美, 品质优, 早熟, 耐贮运, 丰产稳产, 适应性强, 适合在河南及周边平原、丘陵、山地等杏栽培区栽培。

关键词: 杏; 新品种; 早红艳; 早熟; 硬肉; 优质

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Zaohongyan, a superior early-maturing and firmness flesh apricot cultivar

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Abstract: Zaohongyan apricot is a new superior early-maturing and firmness flesh apricot cultivar, which was newly selected from 116 natural-bred offsprings of Chuanzhihong apricot. Chuanzhihong apricot was discovered in Julu county, Hebei province, has been cultivated for more than 300 years. Chuanzhihong apricot got its name because of its red and dense clusters of fruit and outstanding fruit quality, and it was introduced into Zhengzhou Fruit Research Institute in the nineties. Zaohongyan apricot was approved by the Approval Committee for Improved Varieties of Forest Tree of Henan province in March 2020. The fruit shape of Zaohongyan apricot is oval with attract appearance and the average fruit weight is 71.7 g, and the maximum fruit weight is 95.0 g. The fruit is nearly symmetry, the suture is shallow, the cavity is medium deep, the apex is light round bulge and has the fruit top. The ground color of Zaohongyan apricot is orange-yellow and the sunny side turns to be bright red at full ripening stage. The surface of Zaohongyan apricot fruit is fluffy and the fruit peel is medium thick, and the flesh is orange-yellow in color, delicate in texture with flesh thickness of 17.56 mm, with a low fiber content. The fruit is pulp hard, with balanced sugar/acid ratio and intense fruity aroma. The fruit soluble solids content is 16.5%, the total soluble sugar content is 8.96%, the total acid content is 0.82%, the Vitamin C content is 8.69 mg·100 g⁻¹, and the crude fibre content is 0.4%. The fruit stone of Zaohongyan apricot is elliptic, brown and detached from the flesh. Zaohongyan apricot has bitter and plump kernel, and the edible rate is 96.6%. When investigating in Xinxiang area, Henan province, Zaohongyan apricot started

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germinating in early-March, early blossoming in the first ten days of March, and full blossoming in mid-March, with the flowering period is approximately 7-10 days. The flower of Zaohongyan apricot is showy and the anther is light yellow with a lot of pollen. The flower is with five petals and is white in color, with one pistil and 32-40 stamens. The ripening date of Zaohongyan apricot is late May in Xinxiang, which is about 5 days late than that in Zhengzhou. The fruit development period is about 62 days. The fruit can continue to harvest for about 15 days, and can be stored at room temperature for about 7-10 days. The leaf bud starts germinating in late March and expands in early April. Trees defoliation starts in early-November and fully deciduous by mid-November, the tree vegetative growth period lasts about 220 days. The tree habit of Zaohongyan apricot is spreading and tree vigor is strong. It's easy to florescence, and fruits of Zaohongyan apricot are mainly bore on short fruit branches and bouquet fruit branch results. Pollination trees are needed because of its poor self-flowering ability. Fruiting starts at the second year, bearing fruit in large quantities at the third year, high yield period usually comes at the fourth year after grafting, and the average yield of a five-year tree reaches up to 45.0 kg. Zaohongyan apricot is a new superior early-maturing and firmness flesh apricot cultivar which has beautiful appearance and exhibits strong suitability to undesirable circumstances and is highly and stably productive for high quality fruits. It is suitable to be cultivated and developed in Henan province and the other apricot suitable planting areas of China.

Key words: Apricot; New cultivar; Zaohongyan; Early-maturing; Hard flesh; Superior

杏(*Prunus armeniaca* Lam.)是原产中国的特色果树,在我国杏栽培历史悠久,栽培面积和产量均居世界首位^[1]。杏外观美,风味佳,成熟早,果实营养价值极高,深受消费者的喜爱。目前,生产上广泛栽植的杏大多是自然实生品种,口感较好但产量低而不稳。从国外引进的杏品种金太阳和凯特,表现为丰产性好,但口感较酸、风味较差、品质中,近几年栽植越来越少。近些年来,我国杏育种工作者相继培育出一系列杏品种,有早金艳、金荷、金宇^[2]等极早熟品种,玫硕、京香红和京脆红等早熟品种,玫香、黄金油杏^[3]等中熟品种,陇杏1号等中晚熟品种,冀光、京佳2号等鲜食加工兼用品种,但目前生产上早熟、硬肉、高产、优质、抗性强的杏品种仍相对短缺。为满足市场需求,中国农业科学院郑州果树研究所经过多年的系统选育,选育出优质早熟硬肉杏新品种早红艳。

1 选育经过

2006年收集串枝红种子258粒。2007年春季播种,繁育出实生苗116株,进行正常水肥抚育管理,分别编号、调查。2010年实生苗开始开花结果,对果实经济性状、丰产性能、结果习性、抗性等多方面观察、鉴定,其中编号为3-21的实生苗,表现为坐果率高,果形美观,品质优异,成熟期早,采果期长,遂

定为优良单株。

2011年春进行大树高接和苗木嫁接。2012年春将一年生嫁接苗定植在试验园内,进行观察试验。2013年调查发现高接树和嫁接的定植苗,均开始开花结果,并表现良好。经2013—2016年连续4 a(年)对3-21杏高接树和嫁接苗的果实经济性状、丰产性能、生长结果习性、抗性等多方面观察,品质和性状稳定。

2013年起在开封杞县、南阳淅川县、洛阳偃师市、三门峡等试验点进行区域试验,对照品种为金太阳、红艳等。经过对各区域试验点连续多年的观察,3-21果实经济性状和重要农艺性状表现稳定,果面着色、果实品质、成熟期等方面优于对照,深受生产者和消费者好评,是很有发展潜力的早熟、硬肉杏新品系。2020年3月通过河南省林木品种审定委员会审定,命名为早红艳(良种编号:豫S-SV-AV-007-2019)(图1)。

2 主要性状

2.1 果实经济性状

早红艳果实卵圆形,平均单果质量71.7 g,最大单果质量95.0 g,纵径5.52 cm,横径5.28 cm,侧径5.39 cm,果形指数1.05。果实较对称,缝合线浅,梗洼中深,果顶圆凸,有果顶尖,果面光滑,果皮有短茸



图1 杏新品种早红艳

Fig. 1 A new apricot cultivar Zaohongyan

毛。果实底色橙黄色,阳面鲜红色,有光泽,果皮中厚。果肉橙黄色,肉厚质细,果肉厚度17.56 mm,果肉硬,纤维少,粗纤维含量(w ,后同)0.4%,汁液多,味甜,芳香浓郁。可溶性固形物含量16.5%,pH值6.7,维生素C含量 $8.69 \text{ mg} \cdot 100 \text{ g}^{-1}$,可溶性糖含量8.96%,总酸含量0.82%(表1)。果核小,平均果核质量2.8 g,纵径2.52 cm,横径1.76 cm,侧径1.20 cm;果核呈椭圆形,离核,核仁苦,种仁较饱满,干仁平均质量0.7 g;果实可食率达96.6%;可持续采摘15 d左右,常温下可贮藏7~10 d。

2.2 植物学特征

早红艳生长势强,树姿开张,成枝能力强。主干褐色,多年生枝灰褐色,1年生枝粗壮,背面黄褐色,阳面红褐色,光滑无毛,锐角斜生,节间长1.8 cm,皮孔灰白色,中多、平、小,呈椭圆形。花瓣5个,浅粉红色,每朵花包括1枚雌蕊和32~40枚雄蕊,柱头略低于花药,花药黄色。叶片圆形,叶长8.00 cm,叶宽7.28 cm,叶表深绿色,叶基钝圆形,尖端中等钝角,叶

表1 早红艳与对照品种果实经济性状比较

Table 1 Comparison of economic characters for Zaohongyan and the control cultivars

品种 Cultivar	成熟期 Maturity period	平均单果质量 Average fruit mass/g	果形 Fruit shape	肉质 Flesh texture	汁液 Juice content	风味 Flavor	品质 Quality	w(可溶性固形物) Soluble solids content/%	w(维生素C) Vitamin C content/ ($\text{mg} \cdot 100 \text{ g}^{-1}$)	w(可溶性糖) Soluble sugar content/%	w(总酸) Total acid content/%
早红艳 Zaohongyan	5月下旬 Late May	71.7	卵圆形 Ovate	厚细 Thick and less fiber	多 Many	香甜 Fragrant and sweet	极上 Extremely Superior	16.5	8.69	8.96	0.82
红艳 Hongyan	6月上旬 Early June	72.0	近圆 Approach globose	厚细 Thick and less fiber	多 Many	酸甜 Sour and sweet	极上 Extremely Superior	14.6	6.68	7.76	1.14
金太阳 Jintaiyang	5月下旬 Late May	66.0	近圆 Approach globose	厚细 Thick and less fiber	较多 More	甜微酸 Sweet with slightly sour	上 Superior	14.5	7.26	7.97	1.10

尖长,叶缘尖锯齿,叶缘起伏中,叶柄长4.89 cm,暗红色,蜜腺圆形,中大,蜜腺数多于3个。

2.3 生长结果特性

早红艳树势较强,树体较直立,经调查,新乡地区4年生树高3.3 m,地径12 cm,冠幅3.50 m,干周48.5 cm。当年新梢平均长46.8 cm,枝条直径平均为0.8 cm。早红艳早果性强,立地条件好的杏园,嫁接苗定植后第2年即可开花结果,第3年即可大量结果,第4年即可进入丰产期,5年生树株产45 kg以上。早红艳生理落果和采前落果现象不明显,一般年份不会发生裂果,果实内部无褐变现象。早红艳以短果枝和花束状果枝结果为主,自花结实能力差,

需配置授粉树。经试验对比,早红艳的产量优于同类杏品种串枝红、金太阳、红艳等。

2.4 物候期

在新乡地区观察发现,一般年份早红艳3月初花芽开始萌动,3月上旬开花,3月中旬盛花期,花期5~7 d,花落后子房逐渐膨大,5月下旬果实成熟,果实发育期约62 d;3月下旬叶芽开始萌动,3月底展叶,11月初开始落叶,到11月中旬完全落叶,树体营养生长约220 d。新乡物候期比郑州晚5 d左右。

2.5 适应性与抗性

早红艳在新乡(壤砂土)、开封杞县(壤砂土)、南阳淅川县(丘陵黏土)、洛阳偃师市(壤土)、三门峡

表 2 早红艳与对照品种产量比较

Table 2 Comparison of fruit yield for Zaohongyan and the control cultivars

品种 Cultivar	3 a 生 3-year-old tree		4 a 生 4-year-old tree		5 a 生 5-year-old tree	
	666.7m ² 产量 666.7m ² yield/kg	平均株产 The average strain/kg	666.7m ² 产量 666.7 m ² yield/kg	平均株产 The average strain/kg	666.7 m ² 产量 666.7 m ² yield/kg	平均株产 The average strain/kg
早红艳 Zaohongyan	716.8	12.8	1 691.2	30.2	2 520.0	45.0
红艳 Hongyan	558.0	10.0	1 340.4	23.9	2 230.5	39.8
金太阳 Golden-sun	451.6	8.0	1 148.0	20.5	1 920.8	34.3

(贫瘠山地)等地进行区域试验或引种栽培时,均生长良好,表现出较好的耐干旱、抗早春霜冻、耐瘠薄能力,适应性强。经区域试验或引种栽培表明,早红艳山地、丘陵、平原和沙滩地均可种植,在河南、陕西、山西、河北、山东等黄河流域及生态类型相似地区均可栽培。

3 栽培技术要点

3.1 建园定植

杏园宜建在地势较高、不积水的地块,宜选择土层深厚、透气性好的壤砂土建园。定植前挖深、宽60~80 cm的定植沟(穴),将原土与适量秸秆、腐熟的羊粪或牛粪等混合均匀后回填,浇透水,等土壤沉实后再挖小穴定植。在落叶后到萌芽前均可定植,干旱瘠薄山坡地、沙荒地及丘陵地可适当密植,株行距一般以(2~3)m×(3~4)m为宜;平原肥水充足地区可适当稀植,株行距以(3~4)m×(5~6)m为宜。早红艳白花结实率较低,建园时需同时栽植与其花期相一致的杏品种作为授粉树,如凯特、玫香、玫硕、红艳等,配置比例一般为4:1。

3.2 整形修剪

早红艳可采用自由纺锤形、开心形或主干疏散分层形的树形。冬剪时对幼树骨干枝的延长枝以轻剪长放为主,促进营养生长,增加分枝,扩大树冠;为防止结果部位外移,成龄树应对结果枝组进行回缩更新。夏剪时去掉徒长枝、竞争枝和过密枝,改善通风透光条件,对幼树新梢及时摘心改造成结果枝组,对冠内细弱枝和下垂枝要进行重剪,以防内膛光秃。落花后2周应及时进行疏果,一般长果枝留4~6个果,中果枝留2~3个果。

3.3 肥水管理

果实采收后在9—10月施入以有机肥为主的基肥,施入量应占全年施肥量的50%~70%。幼树和初结果树一般每666.7 m²施基肥2000~4000 kg,盛果

期树一般每666.7 m²施基肥5000 kg。追肥有3个关键时期,萌芽前追施高氮型复合肥,根据树龄和株产,株施0.25~1.0 kg,促进根、芽、叶、花展开,提高坐果率;果实硬核期追施高钾型复合肥,株施0.5~2.0 kg,促进果实膨大;果实采收后追施氮磷钾复合肥,株施0.5~1.5 kg,补充养分,利于花芽分化^[2]。灌水的的关键时期为萌动期、硬核期、果实膨大期和封冻期,施肥后和土壤干旱时适时浇水,雨季要注意排水防涝。果实采收前10 d内不宜浇水,以防降低果实品质。

3.4 病虫害防治

早红艳成熟较早,病虫害相对较少,早春杏树发芽前,喷1次5 mg·kg⁻¹石硫合剂,消灭越冬若虫,重点加强蚜虫、介壳虫等虫害,褐腐病、疮痂病、穿孔病等病害的防治。

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