

# 黄肉鲜食桃品种‘黄金蜜桃3号’的选育

牛良, 鲁振华, 崔国朝, 曾文芳, 潘磊, 王志强\*

(中国农业科学院郑州果树研究所·国家桃、葡萄改良中心, 郑州 450009)

**摘要:** 白肉桃占据我国鲜食桃品种的主导地位, 黄肉桃由于富含类胡萝卜素等健康有益成分, 近年来受到部分消费者的青睐。‘黄金蜜桃3号’是中国农业科学院郑州果树研究所选用桃优系‘92-3-39’(母本)和‘91-2-2’(父本), 通过人工杂交培育出的黄肉鲜食桃品种。该品种果实近圆形, 果顶圆平, 偶有小突尖, 平均单果质量258 g, 大果质量363 g, 成熟时果皮底色黄, 茸毛长度中等, 大部分果面着深红色, 套袋果呈金黄色。果肉橙黄色, 可溶性固形物含量( $w$ , 后同)11.8%~13.6%, 近核处红色素多, 肉质致密, 味甜, 黏核。花铃型, 花粉多, 自花结实, 丰产。郑州地区2月底花芽萌动, 3月下旬开花, 果实7月底至8月初成熟。

**关键词:** 桃; 新品种; ‘黄金蜜桃3号’; 黄肉

中图分类号: S662.1

文献标志码: A

文章编号: 1009-9980(2018)10-1297-04

## ‘Golden Honey 3’, a new yellow-fleshed fresh peach cultivar

NIU Liang, LU Zhenhua, CUI Guochao, ZENG Wenfang, PAN Lei, WANG Zhiqiang\*

(Zhengzhou Fruit Research Institute, Chinese Academy of Agricultural Sciences·National Peach and Grape Improvement Center, Zhengzhou 450009, Henan, China)

**Abstract:** China, the source origin of *Prunus persica*, is the largest peach producer in the world from 1993. For a very long period, and till now, most fresh peaches produced in China are white-fleshed. The yellow-fleshed peach is also named ‘Canning peach’. In recently years, more and more people pay more and more attention to the yellow-fleshed peach because of the exceptionally carotenoids which are beneficial to human health. Carotenoids that contain unsubstituted beta-ionone rings (including beta-carotene, alpha-carotene, beta-cryptoxanthin and gamma-carotene) have vitamin A activity (meaning that they can be converted to retinol), and these and other carotenoids can also act as antioxidants. In the eye, lutein, meso-zeaxanthin, and zeaxanthin are present as macular pigments whose importance in visual function remains under clinical research in 2017. But there are few yellow-fleshed fresh peach cultivars available in China for farmers to choose. It’s a big job for breeders to release more yellow-fleshed fresh peach cultivars. Aiming at fresh yellow-fleshed peach, we choose ‘92-3-39’, a middle season yellow flesh peach selection, as female parent and ‘91-2-2’, a early ripening yellow nectarine selection for pollen donation. In spring of 1997, the cross was done by artificial castrating, pollinating, and bagging in case of interference from non-targeting pollen. 23 hybrid fruits were harvested after matured. The fruits were cleaned and disinfected with 75% alcohol. Then, the seeds were drawn out, put on wet sterilized filter paper in petri dishes aseptically. Finally, the dishes were sealed with Parafilm and stored under temperature of 2–7 °C for about 90 days. When the seeds began to germinate, we planted them in Pindstrup’s substrate. Till the seedlings grew up to about 5 cm tall, transferred to mixed substrate with full nutrition. Eleven seedlings were survived and transplanted to *in vivo* the next spring with 1 m in line and 4 m in row. The trees were pruned to V-shape. Other agronomic measures were done as normal. Two seasons later, most of the trees began to flower and fruit, ‘97-3-88’, one of the hybrid seedlings, exhibited round,

收稿日期: 2018-03-16 接受日期: 2018-08-01

基金项目: 中国农业科学院科技创新工程专项经费 (CAAS-ASTIP-2018-ZFRI)

作者简介: 牛良, 男, 副研究员, 主要从事桃遗传育种研究。E-mail: niuliang@caas.cn

\*通信作者 Author for correspondence. Tel: 0371-65330962, E-mail: wangzhiqiang@caas.cn

big, yellow fruits with good flavor and high yield which were prior to others in the followed 2 fruiting year. After 4 years grafted tree evaluation and distinctness, uniformity and stability tests, the selection was put on to pre-production tests. In 2015, this selection was authorized to release and named 'Golden Honey 3'. The fruit of 'Golden Honey 3' is round, incidentally accompanying a small tip. The fruit skin is covered with middle density of white fuzz. The ground of the fruit skin is yellow and mostly dyed dark red when matured. It's large with average fruit weight 258 g and up to 363 g for the big ones. The vertical, transverse and side diameters of the fruit are 76.7, 83.2, 80.2 mm, respectively. The flesh is yellow with much anthocyanin around the stone. The fruit texture is melting with middle amount of juice. The soluble solids, total sugar, total acid contents in the fruit juice are 11.8%–13.6%, 10.6%, 0.27%. The eating quality is very good. The stone is cling. The leaves of 'Golden Honey 3' are green and lanceolate in shape. It's length and width are 17.2 cm and 4.18 cm, separately. The lengths of petioles are about 0.8–1.4 cm with 2–3 reniform glands. The flower is non-showy with 5 petals. It's fertility and fruitful. In Zhengzhou, the bud break of 'Golden Honey 3' happens in end of February. The flowers start to open in late March and can last for 3–7 days. The fruits can be harvested from end of July to early of August, so the fruit development period is about 125 days. The leaves begin to fall in early November. The growth period is 240 days approximately. The tree is middle vigorous and half spreading. The ability of germinating and sprouting are on the average level. New branches are green with dark red coloration on sun side. The internodes on fruitful branches are 2.14 cm on average. The node order of flowering on fruiting branches is 1 to 2. Middle and long fruiting branches, with more double flower buds, are the main types of bearing branches. When full bearing period is coming, the vigorous may turn moderation and the new shoots may become a little shorter. The trees can start to fruit from the 2<sup>nd</sup> season after the grafted nursery stocks planted. The yield can reach 18.0 tons per hm<sup>2</sup> in the third season and 37.5–45.0 tons in full bearing period. For cultivation techniques, nothing is special to pay attention. The fruit bagging is recommended to prevent infestation of pests and diseases. There are also some consumers preferring the uncolored golden fruits, so the fruits can be harvested with the bag un-removed.

**Key words:** Peach; New cultivar; 'Golden Honey 3'; Yellow flesh

桃原产中国,在我国有3 000 a(年)以上的栽培历史,其果实汁多味美,营养丰富,老少皆宜,深受人们喜爱。而我国传统栽培的鲜食桃多为白肉类型,“黄桃”一直是罐桃、加工桃的代名词,近些年来,随着人们对健康的更多关注,富含类胡萝卜素等健康有益成分的黄肉桃受到消费者越来越多的关注,类胡萝卜素包含不可替代的 $\beta$ -紫罗兰酮环(包括 $\beta$ -胡萝卜素、 $\alpha$ -胡萝卜素、隐黄质、 $\gamma$ -胡萝卜素),具有维生素A活性,意味着它们可以转化为视黄醇,这些类胡萝卜素起抗氧化作用。在眼睛中,叶黄素、消旋玉米黄质和玉米黄质均作为视网膜黄斑色素存在,在最新的临床研究中证实具有重要的视觉功能<sup>[1]</sup>。此外,黄肉桃在类胡萝卜素积累的同时,也积累了其他丰富的次生代谢物质,使其果实的风味更加浓郁,也成为其吸引消费者的另一要素。

我国早在1957年就开展了黄肉桃的育种工作,在20世纪70年代进入盛期,之后由于各种原因迅速

萎缩<sup>[2]</sup>。这期间培育的黄肉桃品种以制罐用为主,肉质以不溶质为主,有别于普通鲜食桃以溶质为主的类型。近些年来,也陆续有一些鲜食黄肉桃品种问世,并在生产上推广,如‘金陵黄露’<sup>[3]</sup>、‘锦绣’、‘锦园’<sup>[4]</sup>、‘美锦’<sup>[5]</sup>、‘黄水蜜’<sup>[6]</sup>等,但品种缺口依然较大,供不应求现象明显。

针对我国市场需求及品种选育现状,以黄肉优质等为目标选配杂交组合,选育出鲜食黄肉桃品种‘黄金蜜桃3号’。该品种果实发育期125 d左右,果个大,品质优,经生产试验表明,经济性状表现稳定,深受市场欢迎,于2015年通过河南省林木品种审定。

## 1 选育经过

以黄肉、优质、大果等为目标,选择中熟黄肉桃优系‘92-3-39’(中熟桃,果个中大,果形端正)为母本,以黄肉桃优系‘91-2-2’为父本,采用传统人工有性杂交方法,于1997年3月底在中国农业科学院郑州果

树研究所桃育种圃进行人工去雄,授粉杂交,并套袋防止花粉混杂,杂交种子23粒经无菌低温层积90 d左右,于温室播种培育获得杂种实生苗11株。1998年4月定植到育种圃田间,东西行,株行距1.0 m×4.0 m,按常规方法栽培管理。

杂种实生苗于2000年开始陆续开花结果,编号为‘97-3-88’的单株表现小花型,单瓣,有花粉,果实大,品质优,母树经连续3 a观察,果实主要性状表现稳定。2002年秋季从母株采集接穗,进行了嫁接观察,结果表明,各关键性状与母树保持一致,受栽培条件影响,果实大小、着色等方面稍有改善,复选后开始布置生产试验。‘黄金蜜桃3号’系谱图见图1。

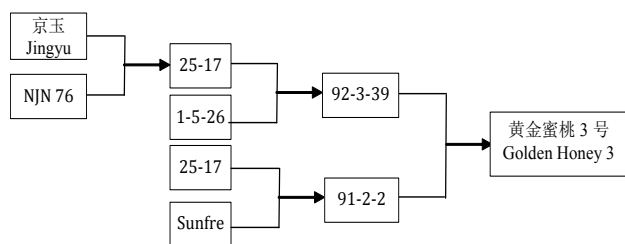


图1 ‘黄金蜜桃3号’系谱图

Fig. 1 Pedigree of yellow-fleshed fresh peach cultivar ‘Golden Honey 3’

## 2 主要性状

### 2.1 果实主要经济性状

‘黄金蜜桃3号’果实为近圆形,果顶圆平,偶具

小突尖,果基正,梗洼中深,较窄;缝合线浅,两半部较对称,成熟度一致(图2)。果个大,单果平均质量258 g,大果质量363 g,平均纵径、横径和侧径分别为76.7、83.2、80.2 mm。果实表面茸毛中等,底色黄,成熟时多数果面着深红色。果肉橙黄色,硬溶质,肉质细,致密,汁液中多,近核处红色素较多,味甜。可溶性固形物含量(w,后同)11.8%~13.6%,总糖10.6%,总酸0.27%,品质优。黏核(表1)。



图2 ‘黄金蜜桃3号’结果状

Fig. 2 The fruits on tree of ‘Golden Honey 3’ 7 days after bag removed

表1 ‘黄金蜜桃3号’与对照品种主要经济性状比较

Table 1 Comparison of main economic characters for ‘Golden Honey 3’ and the controls

品种 Cultivar	花型 Flower type	成熟期 Maturing period	果形 Fruit shape	着色 Skin color	平均单果质量 Average fruit mass/g	w(可溶性固形物) Soluble solid content/%	核 Stone adhesion	丰产性 Yield
黄金蜜桃3号 Golden Honey 3	铃型 Non-showy	8月初 Early Aug.	圆正 Round	多 Much	258	13.6	黏 Cling	丰产 High
美锦 Meijin	蔷薇型 Showy	7月中下旬 Mid-late Jul.	椭圆 Oval	中 Middle	197	13.1	离 Free	丰产 High
锦绣 Jinxiu	蔷薇型 Showy	7月下旬 Late Jul.	椭圆 Oval	少 Little	213	13.4	黏 Cling	丰产 High

### 2.2 植物学特征

‘黄金蜜桃3号’1 a生新梢绿色,阳面紫红色,中果枝平均节间长2.14 cm。叶片披针形,叶面绿色,叶基锐尖,叶缘具浅锯齿;叶片平均长度17.2 cm,宽度4.18 cm,叶柄长度0.8~1.4 cm。叶柄具腺体2~3个,多肾形。花铃型,花瓣5枚,花粉多。

### 2.3 物候期

郑州地区2月底开始萌动,3月下旬开花,花期持续3~7 d。果实7月底至8月初成熟,果实发育期约125 d左右。11月初开始落叶,全年生育期240 d左右。

### 2.4 生长结果习性

‘黄金蜜桃3号’树势中庸,树姿较开张,萌芽率、成枝力中等,初结果树新梢年平均生长量约36.2 cm。花芽起始节位多为1~2节,花芽密,以复花芽为主。盛果期后,树势趋于中庸,新梢生长量减少。

早果性强,春天定植速生苗或芽苗,当年可形成部分花芽,第二年开始结果,第三年后逐渐进入丰产,每666.7 m<sup>2</sup>产量超过1 200 kg,盛果期每666.7 m<sup>2</sup>产量2 500~3 000 kg。该品种各类果枝均能结果。

### 3 栽培技术要点

#### 3.1 建园

选择光照充足、有机质含量较高、排水良好的地块为园址,平地南北成行,丘陵坡地沿等高线成行。淮河以北及干旱瘠薄地区适当密植,株行距(1.2~1.5) m×(2.5~3.0) m(主干形)或(1.2~1.5) m×4.0 m(V字形),淮河以南及平原肥水充足地区应适当稀植,株行距(2.5~3.0) m×(4.0~5.0) m(多主枝V字形)。

#### 3.2 整形修剪原则

(1)培养强健主枝,控制侧枝和结果枝组大小:幼树期主枝延长头最好每40~50 cm时摘心1次,以促进主枝增粗和分枝;强旺侧枝长到15 cm时摘心控势。

(2)加强夏剪,控上促下:生长季及时疏除上部外围旺长枝,打开光照,改善树冠中下部光照条件。

#### 3.3 土肥水管理

每年9—10月份(落叶前1个月)重施有机肥;幼树期适当补充氮肥,生长季后期(7月份之后)控肥控水;盛果期后,视树势强弱适当补充复合肥。采收前10 d以内不宜浇水,以防风味变淡。

#### 3.4 花果管理

以产定果,建议每666.7 m<sup>2</sup>控制产量为2 500~3 000 kg。花后35 d左右,大、小果分明时疏除畸形果、病虫果和多余果。病虫害多发地区建议进行套袋栽培,选用内黑或红色的双层果袋,‘黄金蜜桃3号’套袋后果面不着色,可带袋采收。

#### 3.5 适栽地区及病虫害防控

‘黄金蜜桃3号’可在长江流域及以北桃产区栽培。试验及生产过程中未发现其对病虫害有特异抗性,生产中应做好监测,根据病虫害活动情况及时做好防控措施。

#### 参考文献 References:

- [1] BERNSTEIN P S, LI B, VACHALI P P, GORUSUPUDI A, SHYAM R, HENRIKSEN B S, NOLAN J M. Lutein, zeaxanthin, and meso-zeaxanthin: the basic and clinical science underlying carotenoid-based nutritional interventions against ocular disease [J]. *Progress in Retinal and Eye Research*, 2015, 50: 34-66.
- [2] 马之胜,贾云云,王越辉,陈江玉. 我国黄肉桃育种研究进展 [J]. *江西农业学报*, 2011, 23(10): 55-57.  
MA Zhisheng, JIA Yunyun, WANG Yuehui, CHEN Jiangyu. Breeding progress of yellow flesh peach in China [J]. *Acta Agriculturae Jiangxi*, 2011, 23(10): 55-57.
- [3] 许建兰,马瑞娟,俞明亮,张斌斌,宋宏峰,沈志军,周懋. 早熟鲜食黄肉桃新品种‘金陵黄露’的选育 [J]. *果树学报*, 2016, 33(10): 1324-1327.  
XU Jianlan, MA Ruijuan, YU Mingliang, ZHANG Binbin, SONG Hongfeng, SHEN Zhijun, ZHOU Mao. A new early-ripening peach cultivar ‘Jinlinghuanglu’ [J]. *Journal of Fruit Science*, 2016, 33(10): 1324-1327.
- [4] 叶正文,苏明中,张学英,高清华,杜纪红,吴玉良,庄恩及. 中晚熟鲜食黄桃新品种——锦园的选育 [J]. *果树学报*, 2008, 25(6): 955-956.  
YE Zhengwen, SU Mingshen, ZHANG Xueying, GAO Qinghua, DU Jihong, WU Yuliang, ZHUANG Enji. Jinyuan, a new mid-late yellow peach cultivar [J]. *Journal of Fruit Science*, 2008, 25(6): 955-956.
- [5] 马之胜,贾云云,陈体先,王越辉,马文会,宣立锋,王建学,李海山. 优质黄肉鲜食桃新品种‘美锦’ [J]. *园艺学报*, 2009, 36(4): 615.  
MA Zhisheng, JIA Yunyun, CHEN Tixian, WANG Yuehui, MA Wenhui, XUAN Lifeng, WANG Jianxue, LI Haishan. A new good quality, yellow flesh, fresh consuming peach cultivar ‘Meijin’ [J]. *Acta Horticulturae Sinica*, 2009, 36(4): 615.
- [6] 李靖,陈延惠,孙守如,胡青霞,郑先波,简在海. 早中熟鲜食黄桃新品种‘黄水蜜’ [J]. *园艺学报*, 2005, 32(4): 756.  
LI Jing, CHEN Yanhui, SUN Shouru, HU Qingxia, ZHENG Xianbo, JIAN Zhaihai. A new early mid maturing table peach variety ‘Huangshuimi’ [J]. *Acta Horticulturae Sinica*, 2005, 32(4): 756.

#### 欢迎订阅2019年《河北果树》

《河北果树》是河北省果树学会主办的果树专业技术期刊,中国核心期刊(遴选)数据库、中国学术期刊综合评价数据库统计源期刊、中国期刊全文数据库、中文科技期刊数据库收录期刊、河北省优秀科技期刊。主要刊登落叶果树的品种资源、栽培管理、病虫害防治、储藏加工等方面的新成果、新技术、新知识和新信息,开设栏目有专题论述、试验研究、经验交流、百花园、工作历、广告与信息。本刊特色是通俗易懂、科学实用、技术先进、内容丰富、信息量大、可读性强、发行面广。读者对象为果树科研和推广人员、农林院校师生、

各级涉农领导和广大果农。本刊国内外公开发行,双月刊,单月15日出版,国际标准大16开64页,彩色四封,每期定价5.00元,全年6期共30.00元。欢迎广大果农和果树科技工作者到当地邮局(所)订阅,邮发代号18-247。未能从邮局订上本刊的读者,全年都可随时直接汇款至编辑部订阅,免费邮寄。编辑部尚有2004~2016年期刊可邮购。地址:河北省昌黎果树研究所《河北果树》编辑部,邮编:066600,电话:0335-2987632(兼传真),QQ:2567147533, E-mail: hbgbsbjb@sohu.com; 2567147533@qq.com。