果 树 学 报 2017,34(5):649-651
Journal of Fruit Science

DOI:10.13925/j.cnki.gsxb.20160391

草莓新品种‘石莓9号’的选育

张建军[1],李 莉[2],杨 雷[2],杨 莉[2*],董 辉[2],杨秋叶[3],史晓红[4]

([1]河北省农林科学院,石家庄 050051;[2]河北省农林科学院石家庄果树研究所,石家庄 050041;
[3]行唐县农牧局,河北行唐 050600;[4]赵县食品药品检验检测中心,河北赵县 051530)

摘 要:‘石莓9号’草莓以丰产、优质、抗病优系‘458-2’(‘栃乙女’×‘全明星’)为母本,高硬度优系‘455-3’(‘卡姆罗莎’×‘石莓4号’)为父本杂交育成。果实圆锥形,鲜红色,光泽度强;去萼较易;一级序果平均单果质量48.2 g,二级序果平均单果质量24.7 g;果肉红色,质地密且细腻,香气浓,风味酸甜;可溶性固形物含量8.9%,还原糖含量3.15%,可滴定酸含量0.6%,维生素C含量0.47 mg·g^{-1};果实硬度0.520 kg·cm^{-2},耐贮运性好;丰产性好,平均株产469.6 g,适宜露地及保护地半促成栽培。一级序大果适宜鲜食、加工果汁果酱,二级序及以上小果可单体速冻。通过田间观察,‘石莓9号’抗叶斑病、革腐病、炭疽病、白粉病,中抗灰霉病等。

关键词:草莓;新品种;‘石莓9号’

中图分类号:S668.4 **文献标志码**:A **文章编号**:1009-9980(2017)05-0649-03

Breeding report of a new strawberry cultivar ‘Shimei 9’

ZHANG Jianjun[1], LI Li[2], YANG Lei[2], YANG Li[2*], DONG Hui[2], YANG Qiuye[3], SHI Xiaohong[4]

([1]Hebei Academy of Agricultural and Forestry Sciences, Shijiazhuang 050051, Hebei, China; [2]Shijiazhuang Pomology Institute, Hebei Academy of Agricultural and Forestry Sciences, Shijiazhuang 050041, Hebei, China; [3]Forestry and Animal Husbandry Bureau of Xingtang County, Xingtang 050600, Hebei, China; [4]The Food and Drug Inspection Testing Center of Zhaoxian County, Zhaoxian 051530, Hebei, China)

Abstract: ‘Shimei 9’ is a short daylight variety with excellent appearance. The seeding was derived from a cross between ‘458-2’ (‘Tochiotome’×‘Allstar’) and ‘455-3’ (‘Camarosa’×‘Shimei 4’) in 2007 in an experimental field. It was initially selected in 2009 for its bright colors, special flavor, high firmness, high yield and good disease resistance. 5 230 hybrid seeds were got through artificial hybridization pollination. After regional adaptability testing at three different regions in Hebei province (including Handan, Shijiazhuang and Zhangjiakou) over four years from 2010 to 2013, it was finally selected in 2013 with 27.0 cm high and 37.2 cm×33.8 cm spread. The plant is strong and vigorous with erect posture, whose leaves are light green color, 9.3 cm of length, 8.1 cm of width and 0.24 mm of thickness, petiole length and coarseness are 18.2 cm and 3.52 mm. Below the leaf surface is inflorescence, in which growth with white and hermaphrodite flowers of whose crown and calyx diameter are 4.2 cm and 5.18 cm. Pedicels are green color, with 6.0 cm of length and 2.7 mm of width. The stolons are green or red color, in which the length of internode is 21.0 cm. The fruit of ‘Shimei 9’ strawberry is conical, bright red and shiny, on which the sepals were comparatively easy to removed and the first and second grade fruit weight were 48.2 g and 24.7 g. The flesh of fruit is red and dense with fragrant sweet and sour. The contents of soluble solids, reducing sugar and titratable acid are 8.9%, 3.15% and 0.6%, respectively. The hardness is 0.520 kg·cm^{-2}, and the vitamin C content is 0.47 mg·g^{-1}. Quality is excellent. The fruit development period is 25-30 d and it matures at the early March in Shijiazhuang greenhouse or at the early May in Shijiazhuang opening cultivation. The ability of continuous blossom is well and the yield of per plant is up to 469.6 g. It is suit-

收稿日期:2016-11-21 接受日期:2017-01-03
基金项目:农业部公益性行业科研专项(201003064);国家科技支撑项目(2013BAD02B04-02-03);河北省科技支撑计划项目(16226313D-4)
作者简介:张建军,男,研究员,主要从事草莓新品种选育、新技术示范推广等工作。E-mail:nkyzjj@126.com
*通信作者 Author for correspondence. Tel:0311-87659933,E-mail:caomeizu@126.com

able for open cultivation and semi-forcing culture. The first grade fruits are suitable for fresh and processing of fruit juice, jam, the small ones are suitable for quick-frozen. It is resistant to leaf spot (*Ramularia tulasnei*), leather rot (*Phytophthora cactorum*), anthracnose (*Colletotrichum acutatum*), powdery mildew (*Sphaerotheca macularis*), and it is moderate resistant to gray mold (*Botrytis cinerea*) in open field experiment. The firmness of fruit is high, making it has good shopping quality and its cold storage life is about 7 days under 0 ℃. Suitable cultivation area is where the climate is similar to Shijiazhuang and orchard should choose sandy soil which is flat and having ability of moisture and fertilizer retention. The soil in addition to be deeply plowing and made in raised bed, the decomposed manure is used at 5 000 kg per 666.7 m^2. Two rows of plants were planted in Each raised bed, whose spacing was 18 cm. Plant management includes removing old leaves, disease leaves, thinning flower buds and runner. Fruits of 'Shimei 9' need to be harvested at nine mature when the fruits are red with sweet and sour taste. Harvest time is before 9:00 am or after 3:00 pm. The plants should be poured cold water before the soil frozen in opening cultivation, and the plants should be covered with the white plastic, which should be uncovered in the following spring.

Key words: Strawberry; New cultivar; 'Shimei 9'

草莓是多年生常绿草本植物，果实色泽鲜艳，芳香多汁，酸甜适口，营养丰富，属高档水果，是果树中鲜果上市最早的水果[1]。近几年中国的草莓产业发展十分迅速，栽培面积超过13万 hm^2，已成为世界第一生产大国[2]。但目前生产中栽培的品种主要是从国外引进[3]，适宜露地栽培的自育加工品种较少。针对加工品种的育种目标，河北省农林科学院石家庄果树研究所近年来重点开展了露地加工品种的选育研究，2013年通过杂交选育出了鲜食加工兼用的草莓新品种'石莓9号'，并通过河北省省林木良种审定委员会组织的审定，该品种综合性状优于'达赛莱克特'，可作为河北露地栽培的优良品种大面积发展。

1 选育过程

2007年以丰产、优质、抗病优系'458-2'（'栃乙女'×'全明星'）为母本，高硬度优系'455-3'（'卡姆罗莎'×'石莓4号'）为父本进行杂交，组合编号为583。母本和父本均来源于河北省农林科学院石家庄果树研究所自育优系。杂交于4月9日完成，经过选株、择花、去雄、授粉、套袋、挂牌标记等程序，当年获取杂交种子5 230粒，将杂交种子阴干后存放于冰箱低温冷藏保存。于2007年10月1日播种于日光温室，2008年4月5日将实生苗定植于秧苗扩繁田，共成苗3 314株；经秧苗扩繁，2008年8月28日将扩繁杂交实生苗各4株定植于露地初选圃；2009年5月初果实成熟期初选出优株，代号为583-4。2010—2013年在河北省邯郸市、石家庄市、张家口市等地区连续4年复选，新品系均表现出品质优，个大，产量高，硬度大，抗病性好等特性。2013年12月通过河北省林木品种审定委员会审定，定名为'石莓9号'（良种编号为：冀S-SV-FA-030-2013）（图1）。

图1 草莓新品种'石莓9号'

Fig. 1 A new strawberry cultivar 'Shimei 9'

2 主要特性

2.1 植物学特征

在石家庄地区露地栽培植株长势强，株态直立，株高27.0 cm，冠径37.2 cm×33.8 cm。叶片纵径9.3 cm，横径8.1 cm，厚度2.4 mm，叶片浅绿色，中心小叶椭圆形，叶片革质较粗糙，叶柄长18.2 cm，粗3.52 mm，叶柄颜色红绿、茸毛多，托叶中大，耳叶漏斗形。花序低于叶面，花序二歧分枝，分枝较高。两性花，白色，花瓣6~8片，花冠径4.2 cm，花萼单层，萼片中等大，萼径5.18 cm，翻卷，花梗长6.0 cm左右，粗2.7 mm，花梗茸毛多、中粗、硬。匍匐茎颜色红绿，节间长21.0 cm，粗2.32

mm，茸毛中多、粗、较硬，每株抽生匍匐茎35根左右，抽生能力强，能二次抽生，有分枝。根系发达，定植成活率高。

2.2　果实经济特性

果实圆锥形，鲜红色，果面着色均匀，光泽度强，果实萼片平贴或稍离，萼心稍平，去萼较易。一、二级序果平均单果质量48.2 g和24.7 g，整株平均果实质量9.5 g，最大果质量86 g，同一级序果个均匀整齐。果肉颜色红色，质地密。果实风味酸甜，香气浓，可溶性固形物含量（ω，下同）8.9%，还原糖含量3.15%，可滴定酸含量0.64%，维生素C含量0.47 mg·g^{-1}。果实硬度0.520 kg·cm^{-2}，硬度高，耐贮运（表1）。

2.3　生长结果习性

‘石莓9号’植株生长势强，分枝多，抽生匍匐茎容易，繁苗易。2010—2013年在邯郸魏县，石家庄辛集、正定、行唐，张家口等地进行区试，区试结果表明该品种成花容易，平均每株抽生花序4~6个，果个均匀，平均单株产量469.6 g（表1）。

表1　‘石莓9号’与对照品种主要经济性状比较

Table 1　Comparision of main characteristics of ‘Shimei 9’ and the control variety

品种 Cultivar	果形 Fruit shape	果色 Fruir color	一级序果单果质量 Fruit mass of frist grade/g	二级序果单果质量 Fruit mass of second grade/g	最大单果质量 The largest fruit mass/g	风味 Flavor	香气 Fragrance	ω（可溶性固形物） Soluble soid content/%	ω（还原糖） Reducing sugar/%	ω（可滴定酸） Titratable acid content/%	ω（维生素C） Vitamin C content/(mg·g^{-1})	果实硬度 Fruit firmness/(kg·cm^{-2})	平均株产 Plant yield/g
石莓9号 Shimei 9	圆锥 Conical	红 Red	48.2	24.7	85	酸甜 Sweet-sour	浓 Much	8.9	3.15	0.64	0.47	0.520	469.6
达赛莱克特 Daselect	圆锥 Conical	红至深红 Red-Deep red	36.0	19.0	65	酸甜 Sweet-sour	中 Medium	8.2	3.53	0.78	0.51	0.441	372.6

2.4　物候期

在石家庄地区露地栽培，冬天需覆盖白色地膜。露地栽培一般第2年2月下旬或3月初在膜下开始萌芽，3月中下旬开始显蕾，4月初始花，4月中旬盛花，5月初果实开始成熟，6月初果实采收末期，果实发育期28 d左右，匍匐茎4月上中旬开始发生；保护地半促成栽培2月底3月初成熟。对照品种‘达赛莱克特’物候期与‘石莓9号’基本相同。

2.5　抗逆性

通过多年田间观察，该品种抗病性较好，抗叶斑病、炭疽病、革腐病、白粉病，中抗灰霉病。

3　栽培技术要点

3.1　秧苗选择及定植

应选择须根多，根茎粗壮，无病虫危害的健壮子苗；一般在8月中下旬至9月初的阴天或下午4点以后进行秧苗定植；定植时应掌握“深不埋心，浅不漏根”的原则，尤其注意不能埋住苗心，同时注意定植时秧苗弓背应朝向垄沟。采用高垄栽培，双行定植，垄宽50~60 cm，沟宽30~40 cm，行距25 cm左右，株距18 cm，666.7 m^{2}定植8 000株左右。繁苗田定植株行距80 cm×80 cm，666.7 m^{2}定植1 000株左右。

3.2　肥水管理

定植后浇透水，每隔1~2 d浇1次，连浇3次，保证成活。该品种产量高，需肥需水量较大，在现蕾期、果实膨大前绿果期、采收期666.7 m^{2}可追施磷钾肥10 kg；也可进行叶面喷肥，喷施0.3%磷酸二氢钾加0.3%尿素。浇水采用滴灌，小水勤浇，果实成熟期注意控水，雨后应及时排水。

3.3　病害防治

该品种对灰霉病抗性较弱，要适当稀植，使秧苗通风透光，防止郁闭，及时摘除病老残叶，适当疏花疏果，露地栽培雨后及时排水。

3.4　越冬防寒

在土壤上冻前（河北石家庄地区一般在11月中下旬）浇一次冻水，等能下地后覆盖白色地膜越冬，地膜厚度一般在0.006~0.008 mm。第二年春天根据天气情况撤除地膜，撤除地膜的时间一般在3月10日左右。

参考文献 References：

[1] 邓明琴，雷家军．中国果树志·草莓卷[M]．北京：中国林业出版社，2005：1-2.
DENG Mingqin, LEI Jiajun. Chinese fruit trees record·Strawberry Volume[M] Beijing: Chinese Forestry Publishing House. 2005：1-2.

[2] 王壮伟，袁　骥，赵密珍，钱亚明，吴伟民．优质抗病设施草莓新品种‘宁丰’的选育[J]．果树学报，2012，29(5)：958-959.
WANG Zhuangwei, YUAN Ji, ZHAO Mizhen, QIAN Yaming, WU Weimin. ‘Ningfeng’, a new strawberry cultivar with high quality and disease[J]. Journal of Fruit Science. 2012, 29(5)：958-959.

[3] 王桂霞，常琳琳，董　静，钟传飞，王丽娜，张运涛．草莓新品种‘京醇香’的选育[J]．果树学报，2016, 33(2)：254-256.
WANG Guixia, CHANG Linlin, DONG Jing, ZHONG Chuanfei, WANG Lina, ZHANG Yuntao. A new strawberry cultivar ‘Jingchunxiang’[J]. Journal of Fruit Science, 2016, 33(2)：254-256.