

蓝莓新品种宝珠的选育

韩世明^{1,2}, 卢雅妮^{2a}, 方玉梅¹, 尹泽宇², 王丽²,
王贺新^{2,3}, 赵丽娜⁴, 徐国辉^{2,3*}, 熊荣川^{1*}

(¹六盘水师范学院生物科学与技术学院, 贵州六盘水 553000; ²大连大学生命健康学院, 辽宁大连 116622;

³大连森茂现代农业有限公司, 辽宁大连 116112; ⁴大连普世蓝农业科技有限公司, 辽宁大连 116400)

摘要:宝珠是北高丛蓝莓新品种,由莱格西(Legacy)自然杂交实生苗选育而成。果穗密,果实形状呈扁圆形,果实萼片类型平展,果粉中且果粉质地均匀,中等蓝色(102-C,国际通用比色卡蓝色相),果实硬度大(3.0 kg·cm⁻²),平均单果大小为1.55 cm(纵径)×1.74 cm(横径),最大果质量为2.48 g,平均单果质量为1.76 g。可溶性固形物含量(°Brix)为10.17%,酸度中。自然状态下的始熟期为7月上旬左右,早熟品种。该品种对灰霉病具有较强抗性,在半干旱、南方、多雨地区均可栽培。适宜高海拔区域或长江以北的地区,要求土壤深厚、肥沃、排水性好,湿润但不积水;土壤质地以壤砂土或壤土为宜。该品种果实甜,质地面且皮厚,风味好、呈淡香,丰产性中等,适宜作为鲜食品种。

关键词:蓝莓;新品种;宝珠

中图分类号:S663.2

文献标志码:A

文章编号:1009-9980(2023)06-1269-04

Breeding report of a new blueberry cultivar Baozhu

HAN Shiming^{1,2}, LU Yani^{2a}, FANG Yumei¹, YIN Zeyu², WANG Li², WANG Hexin^{2,3}, ZHAO Lina⁴, XU Guohui^{2,3*}, XIONG Rongchuan^{1*}

(¹School of Biological Science and Technology, Liupanshui Normal University, Liupanshui 553000, Guizhou, China; ²Life and Health College, Dalian University, Dalian 116622, Liaoning, China; ³Dalian Senmao Modern Agriculture Co., Ltd., Dalian 116112, Liaoning, China; ⁴Dalian Pushilan Agriculture Technology Co., Ltd., Dalian 116400, Liaoning, China)

Abstract: Baozhu is a new variety of blueberry, which was bred from the natural hybrid seedlings of Legacy. 234 seedlings were obtained in autumn 2011 and planted in spring 2012, and the fruit ripened in early July 2015, from which the superior offspring was selected and numbered SMN-478. After tasting by testing, the characteristic of the strain was proven excellent, such as bigger fruit size and weight, flat round in shape, medium-blue in fruit color, rich fruit powder and uniform texture, sweet flesh, thick skin, good flavor and light fragrance, hardness, high yield, and suitability for fresh market. From July 2017 to July 2018, the characteristics of fine lines and their asexual progenies were evaluated. The results showed that the plant morphology, flowering and fruiting characteristics, fruit yield and quality were consistent, and the specific traits were quite stable. On May 13, 2022, it obtained the new variety certificate issued by the State Forestry and Grassland Administration, which was formally named Baozhu. This variety belongs to the Northern High bush Blueberry, with erect tree canopy, strong tree vigor, flower bud and corolla in red color, short cluster, altar-shaped corolla with corolla ridge, early germination of leaf bud, elliptical leaves with an average leaf area of 9.46 cm², leaf shape index of 1.7, and green color. The average length of new bearing branches is 16.67 cm, and the number of fruits per branch is 13.

收稿日期:2023-02-23

接受日期:2023-04-24

基金项目:贵州省高等学校猕猴桃资源开发与利用重点实验室(黔教技[2022]054);六盘水市科技计划项目(52020-2020-0906);国家林草局知识产权转化运用项目(KJZXXP202214);辽宁省“揭榜挂帅”科技计划重点项目(2022020655-JH1/109);大连市科技创新基金项目(2022JJ13SN092)

作者简介:韩世明,男,副教授,博士,从事果树育种及栽培技术与推广工作。Tel:15685483399,E-mail:94684382@qq.com。a为共同第一作者。

*通信作者 Author for correspondence. E-mail:xugh520@163.com;E-mail:691477843@qq.com

The cluster is dense, the fruit shape is oblate, sepals are flat, fruit powder is medium and uniform, fruit color is medium blue (102-C), and the scar was small and wet. The fruit has good firmness ($3 \text{ kg} \cdot \text{cm}^{-2}$) with average fruit size of $1.55 \text{ cm} \times 1.74 \text{ cm}$, maximum fruit weight of 2.48 g and the average fruit weight of 1.76 g. The soluble solids content of the flesh is about 10.17% and the acidity is moderate. Under the natural conditions, the initial maturity is about early July. It is suitable for growing in the north of the Yangtze River or higher altitude areas. The variety requires loose, deep and fertile soil, good drainage, wet but not waterlogged. Loam or sandy loam soil is appropriate with the soil of pH 4.0–5.5 and organic matter content above 15.0% is better. The chilling requirement of the planting area should be over 600 h. The planting land must be ploughed and leveled, and the ploughing depth is about 20–30 cm. 2-year-old or 3-year-old potted or bare-root seedlings above 40 cm in height and 0.4 cm in diameter at the base of the main stem should be selected to establish the orchard. This variety has good resistance to *Botrytis cinerea* and can be cultivated in southern, rainy and semi-arid areas. It is suitable for growing in north of the Yangtze River or higher altitude areas, where there are loose, deep, and fertile soil, good drainage, moist but not waterlogged land. The soil texture is preferably loamy or sandy loam. In order to manage soil, fertilizer and water well, thoroughly decomposed organic manure should be applied before planting seedlings.

Key words: Blueberry; New cultivar; Baozhu

蓝莓属于杜鹃花科(Ericaceae)越橘属(*Vaccinium* L.)蓝浆果组(Cyanococcus)小浆果类果树,又名蓝浆果、越橘等^[1]。蓝莓果实富含多种营养成分,如花青素、维生素、微量元素等,能预防神经老化、软化血管、抗癌、增强人体免疫力,具有良好的营养和保健作用^[2]。蓝莓的育种驯化、商业化栽培起源于北美,20世纪初由美国Coville博士首次从美国新泽西州的野生越橘优良品系中培育出一批蓝莓新品种,为世界蓝莓育种工作开辟了先河^[3]。自2013年开发出新品种兴安1号开始,我国的蓝莓育种工作才逐渐兴起,直至2018年森茂一号等新品种被培育出来^[4],我国的蓝莓新品种开始大规模涌现,2022年公布的数据显示[该数据来自中国林业知识产权网(<http://forest.ckcest.cn:8080/43.html>)],目前我国蓝莓新品种培育已进入一个快速发展阶段。

1 选育过程

2010年7月,采自大连森茂现代农业有限公司(大连市金州新区华家街道新石村)蓝莓种质资源圃莱格西的种子,于2011年春季在公司进行播种,共收获234株实生苗,2012年春季在大连普世蓝农业技术有限公司(辽宁省大连庄河市长岭镇双盛村)进行种植。2015年7月上旬果实成熟,从中筛选出优良子代,编号为SMN-478,经过品尝和测定,该品系果粒大,呈扁圆形,中等蓝色,果粉中多且质地均匀,

果实甜,质地而且皮厚,风味淡香,硬度大,丰产性中,适合作鲜食的新品种。2017年7月至2018年7月,通过综合评定其无性繁殖后代和优良品系的综合性状,结果表明,开花结果特性、植株形态、果实产量、果实质量等综合指标均具有较好的一致性。已于2022年5月13日获得国家林草局新品种授权证书,命名为宝珠(图1),品种权证书编号为20220028。



图1 蓝莓新品种宝珠

Fig. 1 A new blueberry cultivar Baozhu

2 主要性状

2.1 植物学特征

北高丛蓝莓,树体直立型,树势强;1年生枝绿

色,节间短,新生结果枝平均长度16.67 cm,单枝结果数13个,只在2年生枝上结果;叶片呈椭圆形,叶形指数1.7,平均叶面积9.46 cm²,绿色,叶片边缘为全缘状,叶片伸展状态为内卷,叶芽萌发期早;花序短,花芽及花冠中花青苷显色强度中等,花冠为坛状,花冠上有棱脊。

2.2 果实主要经济性状

果穗密,果实大,果实形状呈扁圆形,果实萼片类型平展,果粉中多且质地均匀,中蓝色(102-C),果蒂痕小而湿,果实硬度大(3 kg·cm⁻²),平均单果大小为1.55 cm × 1.74 cm,最大果质量为2.48 g,平均单果质量为1.76 g,可溶性固形物含量(°Brix)为10.17%,酸度中等。该品种果实口感甜,质地而且皮厚,风味淡香,丰产性中,适宜作为鲜食品种(表1)。

表1 宝珠与莱格西的果实性状比较

Table 1 Comparison of fruit characteristics between Baozhu and Legacy

品种 Cultivar	果实形状 Fruit shape	果实硬度 Fruit hardness/ (kg·cm ⁻²)	果皮颜色 Skin color	酸度 Acidity	果穗紧密程度 Bunch density	平均单果质量 Average single fruit mass/g	w(可溶性固形物) Soluble solid content/%
宝珠 Baozhu	扁圆形 Oblateness	3.00	中蓝色 Medium blue	中等 Medium	紧密 Tightness	1.76	10.17
莱格西 Legacy	扁圆形 Oblateness	3.47	浅蓝色 Wathet blue	极低 Extremely low	稀疏 Sparse	1.53	15.46

2.3 物候期

该品种在辽宁大连地区露地一般3月初开始萌芽,4月中旬开花,花期持续15 d,6月中旬果实开始转色,自然状态下的始熟期通常在7月上旬左右,为早熟品种。

2.4 生长结果习性和适应性

宝珠经田间试验和5年的田间自然特性观察,表明该品种对灰霉病的抗性强,在南方、多雨、半干旱地区均可栽培。

3 分子鉴定

利用自主研发的1对SSR核心引物SSR1522,对自主培育的15个蓝莓产业主推品种进行鉴定(图2),PCR扩增和聚丙烯酰胺凝胶电泳检测显示,该核心引物可以对宝珠进行区分和鉴定,15个品种分别为森茂383、侠女、雪蓝、晨雪、岭雪、森茂413、团圆、春晖、森茂460、森茂七号、珍珠蓝、朝霞、晨雁、海蓝、宝珠。

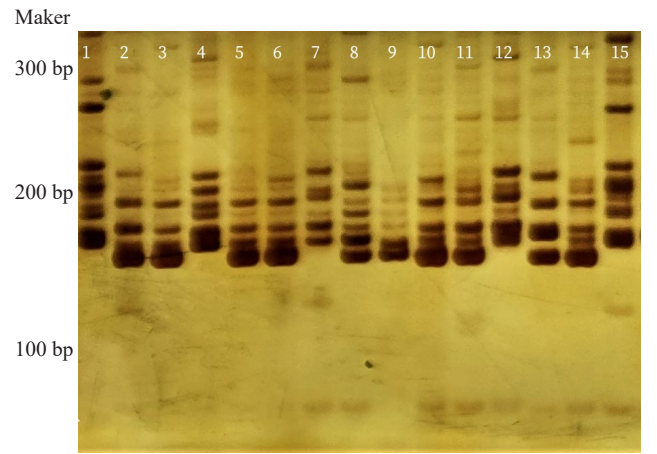
4 栽培技术要点

4.1 适宜种植范围

适宜高海拔区域和长江以北的区域,要求土层深厚、土壤疏松、肥沃、排水性好,湿润但不积水;土壤质地以壤砂土或壤土为宜。pH 4.4~5.5,在土壤有机质含量大于15.0%时为佳。

4.2 建园定植

选用株高40 cm以上,主茎基部直径0.4 cm以



1. 森茂 383;2. 侠女;3. 雪蓝;4. 晨雪;5. 岭雪;6. 森茂 413;7. 团圆;8. 春晖;9. 森茂 460;10. 森茂七号;11. 珍珠蓝;12. 朝霞;13. 晨雁;14. 海蓝;15. 宝珠。

1. Senmao 383; 2. Xianü; 3. Xuelan; 4. Chenxue; 5. Lingxue; 6. Senmao 413; 7. Tuanyuan; 8. Chunhui; 9. Senmao 460; 10. Senmao 7; 11. Zhenzhulan; 12. Zhaoxia; 13. Chenyan; 14. Hailan; 15. Baozhu.

图2 引物对15个蓝莓新品种的扩增结果

Fig. 2 Amplification results of 15 new blueberry varieties with primer pairs

上的2年或3年生的裸根苗。需要600 h以上的低温。选择好的土壤必须经过翻转和平整,翻耕的深度一般在20~30 cm。

4.3 肥水管理

要求全园覆盖秸秆、木屑、松针等材料,其覆盖层厚达10 cm,起到保湿、提高土壤中有机质的含量,并改善土壤理化性质的作用,或可在树冠下使用黑色地膜,可有效抑制杂草的蔓延,在配置滴灌管时

要注意将其放在地膜下。

4.4 病虫害防治

蓝莓的病害主要有溃疡病(茎腐病)、叶片失绿症(缺素症)等。叶片失绿黄化是蓝莓缺铁、缺镁的典型表现,是由土壤pH值偏高及土壤干旱导致的,通过土壤调酸和适当灌溉可以恢复,发生缺素症时,撒施经混匀的100 g 硫磺粉和3 L 草炭及在每株根系附近,并覆盖腐叶土等基质后浇透水。蓝莓害虫主要有地下害虫蛴螬、食叶类刺蛾、蛀干类天牛及鸟类啄食等,蓝莓有机栽培尽量避免使用农药,发现害虫及时采取机械捕杀或用白僵菌等生物农药防治;对于鸟类危害,最好的办法是铺设防鸟网。

4.5 整形修剪

定植后马上进行定干,高度在0.2~0.3 m。根据植株的生长情况,选择8~10条主干、自然形、丛生灌丛,并注意夏季和冬季的修剪,夏季修剪在果实采收结束后再进行,修剪方法是短剪和疏剪。冬季修剪在白露季节进行。

4.6 防寒措施

北高丛蓝莓在胶东半岛及中原区域不需要冬季

防寒,在辽东半岛需埋土防寒、利用镀铝反光膜套袋防寒技术或黑塑料袋内置稻草防寒技术进行冬季防寒。

参考文献 References:

- [1] 刘庆忠,赵红军,郑亚芹,王侠礼,石立岩. 高灌蓝莓微体繁殖技术研究初报[J]. 落叶果树,2001,33(5):1-3.
LIU Qingzhong, ZHAO Hongjun, ZHENG Yaqin, WANG Xiali, SHI Liyan. Preliminary reports on micropropagation of high-bush blueberry[J]. Deciduous Fruits, 2001, 33(5): 1-3.
- [2] 徐国辉,王贺新,高雄梅. 近十年美国蓝莓新品种资源及其特征[J]. 中国南方果树,2015,44(4):138-144.
XU Guohui, WANG Hexin, GAO Xiongmei. The resources and characteristics of new blueberry varieties in the United States in the past ten years[J]. South China Fruits, 2015, 44(4): 138-144.
- [3] 王慧亮,张慧琴,肖金平,谢鸣. 蓝莓育种研究概况[J]. 浙江农业科学,2010,51(3):474-481.
WANG Huiliang, ZHANG Huiqin, XIAO Jinping, XIE Ming. Overview of blueberry breeding research [J]. Journal of Zhejiang Agricultural Sciences, 2010, 51(3): 474-481.
- [4] XU G H, LEI L, WANG H X. 'Senmao 1' northern highbush blueberry[J]. HortScience, 2021, 56(1): 104-105.