

蓝莓新品种晨雁的选育

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摘要: 蓝莓新品种晨雁是由布里吉塔(Brigitta)的自然杂交实生苗选育而成的北高丛蓝莓。果实大, 平均单果纵径为1.47 cm, 横径为1.93 cm, 果实形状为扁圆形, 平均单果质量为2.6 g, 最大单果质量可达3.32 g, 果粉中等且质地均匀, 蓝色, 果蒂痕小而微湿, 果实硬度为3.46 kg·cm², 可溶性固形物含量(w)为12.11%, 酸度中等。在自然状态下, 果实始熟期为7月上旬左右, 为早中熟品种。该品种果实甜脆, 风味好, 有香味, 丰产性好, 适宜作为鲜食品种, 也可以加工成果酱、果干、果汁、果酒、果茶等。

关键词: 蓝莓; 新品种; 晨雁

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Breeding of a new blueberry cultivar Chenyan

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Abstract: Chenyan, a new blueberry cultivar, was bred from the natural hybrid seedlings of Brigitta. The collected seeds were sown in the spring of 2011 and 231 seedlings were planted in the spring of 2012. Those bushes ripened in early July, 2015, from which a superior offspring was selected and numbered SMN-473, which was later named Chenyan. After a series of tasting and identification, it was found that the cultivar had excellent characteristics, such as large fruit grains, oblate shape, light blue color, medium fruit powder and uniform texture, sweet and crisp fruit, good flavor with fragrance, proper firmness and good yield, and it was suitable for fresh market. From July 2017 to July 2018, the comprehensive evaluation on the traits of excellent strains and clones was completed. The results indicated that the plant morphology, fruit quality, fruit yield, flowering and fruiting characteristics and other comprehensive traits were quite consistent, and the specific traits were also stable. In May, 2022, it obtained the new variety certificate issued by the State Forestry and Grassland Administration, and was formally named Chenyan. This cultivar belongs to Northern High-bush Blueberry, the bush gesture is semi-open and vigor is medium. The leaves are long elliptic and dark green in color, and the edge of the leaves is serrated, with an average leaf area of 8.37 cm², leaf shape index of 1.77 and early germination of leaf bud. The average length of new bearing branches is 4 cm, and the number of fruits per branch is 9. The cluster of fruit is dense. The fruit shape is oblate, and the color is medium blue (102-B), the scar is small and wet, fruit firmness (3.46 kg·cm²) is high, and the average single fruit size is 1.47 cm × 1.93 cm. The

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maximum fruit weight is 3.32 g, the average fruit weight is 2.6 g, the soluble solids content is 12.11%, and the acidity is medium. Under natural conditions, the initial ripening period is about in the first ten days of July, and it is a medium-early maturing cultivar. Northern areas of the Yangtze River is suitable for planting this cultivar. The cultivar requires loose, deep and fertile soil, and well drained and wet but not water logging land. The soil texture should be loam or sandy loam with pH value of 4.0–5.5 and the organic matter content of more than 10.0% is better. The chilling requirement of the planting area should reach more than 600 h. The selected land must be ploughed and leveled, and the ploughing depth is about 20–30 cm. As for planting, we usually select 2 or 3-year-old potted seedlings or bare-rooted seedlings with a plant height of more than 40 cm and a diameter of more than 0.4 cm at the base of the main stem to establish an orchard. With regard to the management of soil, fertilizer and water, the whole orchard is required to be covered with straw, sawdust or pine needles on the ground. The thickness of the mulch is more than 10 cm, as it can moisturize the soil and upgrade soil organic matter content, and meanwhile, the physical and chemical properties of the soil are improved. Before planting seedlings, it is required to apply decomposed organic manure. At flowering stage, bees can be applied to increase pollination rate and fruit set, and a special attention should be paid to water supply during fruit swell stage.

Key words: Blueberry; New cultivar; Chenyan

蓝莓,也被称为蓝色浆果,由于具有护眼功能而被人们所熟知,果实富含大量元素,如花青素、维生素、氨基酸等,花青素不仅抗氧化性极强,还能预防紫外线伤害,促进眼部视红素合成,增强眼部防御力,是极具经济价值的一种小浆果树种^[1-2]。目前蓝莓在50多个国家均有种植,栽培历史已超过一个世纪。随着栽培技术的进步,世界范围内的蓝莓产业得到稳定的发展,并选育了许多蓝莓新品种。中国蓝莓的引种工作始于20世纪80年代,新品种选育相对滞后^[3],近年来,随着国内蓝莓育种家对品种选育工作的重视,我国蓝莓育种工作也取得较大进步。

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)蓝莓种质资源圃布里吉塔(Brigitta)蓝莓种子苗,于2012年春季,将该苗栽植于辽宁省大连市庄河市长岭镇的双盛村。期间果树长势良好,2015年开始结果,果实通常7月上旬成熟,经过筛选,得到优良子代,编号为SMN-473。该品种果粒大,呈扁圆形,蓝色,果实萼洼浅,果实脆甜,有香味,果粉中等且质地均匀,风味好,硬度大(硬)产量高,适宜作为鲜食品种。而布里吉塔蓝莓果实呈扁圆形,果实萼洼深、浅蓝色、果蒂痕小而干,果实硬度中等偏大,平均单果大小为1.33 cm×1.62 cm,最大果质量为1.66 g,平均单果质量为1.32 g,酸度极低。在自然状态下,布里吉塔蓝莓通

常7月下旬左右果实开始成熟,属于中熟品种。该品种果实甜,细腻汁多,风味好有香味,丰产性好。与布里吉塔蓝莓相比,晨雁蓝莓平均单果大小增加,两者的最大果质量相差悬殊,平均单果质量也相差明显,酸度增加。晨雁蓝莓的叶片形状为长椭圆形,而布里吉塔蓝莓叶片形状为卵形。在2017年7月—2018年7月间,筛选出优良品系,对无性繁殖后代的性状进行鉴定并进行综合评价,我们发现植株开花结果特征形态、植株生长形态、果实品质特征和果实的产量等综合性状表现一致。由此说明特异性状稳定。于2022年5月获得国家林业和草原局植物新品种权证书,命名为晨雁(图1),品种权编号为20220019。



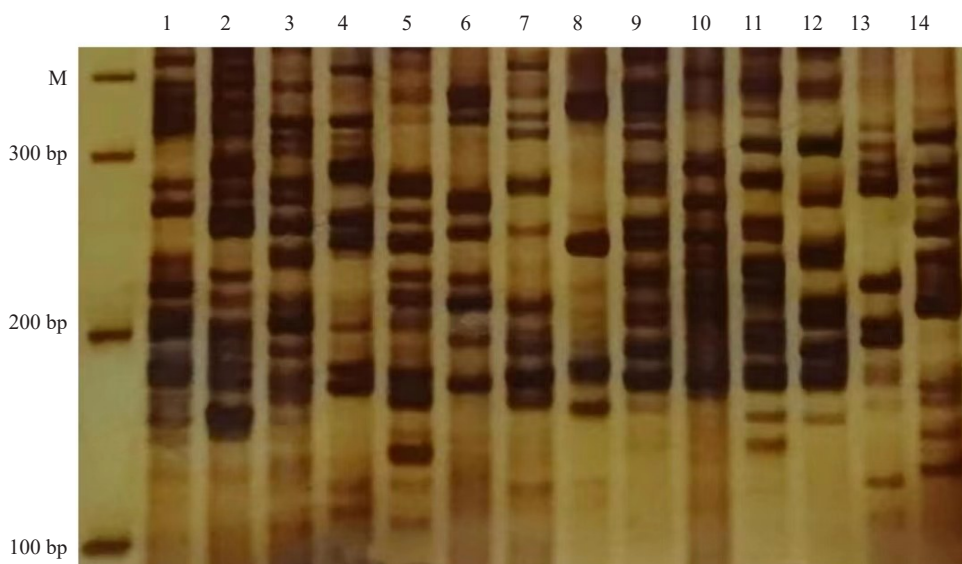
图1 蓝莓新品种晨雁

Fig. 1 A new blueberry cultivar Chenyan

2 分子鉴定

利用自主研发的1对SSR核心引物SSR1551,对所选择的母本布里吉塔蓝莓、子代晨雁和12个蓝莓产业主推品种进行鉴定。图2为引物SSR1551对14份蓝莓品种的扩增图,其中晨雁在第2个泳道,经

过聚合酶链式反应(PCR)扩增和聚丙烯酰胺凝胶电泳检测,该核心引物可以对晨雁和母本以及蓝莓产业主推品种进行区分和鉴定,其中14个品种分别为布里吉塔、晨雁、大粒蓝金、公爵、蓝丰、优瑞卡日出、德雷珀、茉莉塔、文图拉、魔法、自由、休伦、优瑞卡、暮光。



1. 布里吉塔;2. 晨雁;3. 大粒蓝金;4. 公爵;5. 蓝丰;6. 优瑞卡日出;7. 德雷珀;8. 茉莉塔;9. 文图拉;10. 魔法;11. 自由;12. 休伦;13. 优瑞卡;14. 暮光。M. DNA Marker。

1. Brigitta; 2. Chenyan; 3. Big gold; 4. Duke; 5. Blue crop; 6. Eureka-sunrise; 7. Draper; 8. Julieta; 9. Ventura; 10. Magica; 11. Liberty; 12. Huron; 13. Eureka; 14. Twilight. M. DNA Marker.

图2 引物对14个蓝莓品种的扩增结果

Fig. 2 Amplification results of 14 new blueberry varieties with primer pairs

3 主要性状

3.1 植物学特征

晨雁属于北高丛蓝莓,树势中庸,树姿半开张;一年生枝为红色,节间短;叶片深绿色,形状为长椭圆形,叶片边缘形状为锯齿状,叶内面茸毛无或极少,叶芽萌发期早,平均叶面积为 8.37 cm^2 ,叶形指数1.77;新生结果枝平均长度4 cm,单枝可结果数为9个;花序短,花冠形状为坛形,中等大小,花冠上有棱脊,花冠花青苷显色强度中等。

3.2 物候期

该品种在辽宁大连地区一般4月开始萌芽,盛花期为5月,花期持续20 d,在自然状态下,第1批果实成熟时间大概在7月上旬,属于早中熟品种,整个果实采收期持续35 d,果实生长发育期为60 d左右。

3.3 植株适应性

经对繁殖植株田间连续观测及基地调查,结果

显示,该品种适应性较强,适宜种植在阳光和雨水充足的地区。同时还发现该品种具有较强的抗寒性,翌年开花结果良好。

3.4 生长习性

晨雁树体年幼时生长快速,大树萌芽率高,成枝力弱,1年抽梢1次。幼龄树主要以中、长果枝结果为主,成年树树体分散,枝条多,短果枝以及中长果枝均可结果,自然坐果率极高,结果部位分散易向外移。结果早,产量高,定植第3年后开始结果,盛果期一般在第4年。

3.5 果实主要性状

果穗密,果实萼洼深度浅,果实萼片直立着生,萼片平展,果实呈扁圆形,果粉中多且质地均匀,蓝色(102-B),果蒂痕小而湿,果实硬度 $3.46\text{ kg}\cdot\text{cm}^{-2}$,平均单果纵径为1.47 cm,横径为1.93 cm,平均单果质量为2.6 g,最大果质量可达3.32 g,可溶性固形物含量为12.11%,酸度中等(表1)。果实有香气,品质较好。自

表1 晨雁与布里吉塔的果实性状比较

Table1 Comparison of fruit characteristics between Chenyan and Brigitta

品种 Cultivar	果实形状 Fruit shape	果实硬度 Fruit hardness/ (kg·cm ⁻²)	风味 Flavor	果实颜色 Fruit color	成熟期 Maturation period	平均单果质量 Average single fruit mass/g	w(可溶性固形物) Soluble solid content/%	w(酸) Acid content/%
晨雁 Chenyan	扁圆形 Oblateness	3.46	脆甜 Crisp sweet	中蓝色 Medium blue	7月上旬 Early July	2.60	12.11	0.48
布里吉塔 Brigitta	扁圆形 Oblateness	3.30	甜 Sweet	浅蓝色 Light blue	7月中下旬 Mid-late July	1.32	14.43	0.22

然状态下,果实始熟期为7月上旬左右,属于早中熟品种。该品种果实甜脆,风味好,味道清爽有香味,丰产性好,果实品质综合评价高,适宜作为鲜食品种。

4 栽培技术要点

4.1 适宜种植范围

长江以北的区域或者长江以南高海拔区域较为适合本品种栽培。栽培的土壤要疏松、肥沃,土层的深度适中,土壤颗粒小且土壤通气良好,土壤水分要充足,但不能积水,排水性好,避免烂根。蓝莓适应酸性土壤,pH值为4.0~5.5,有机质含量在10%以上的土壤为宜。

4.2 建园定植

定植时选择2年生或3年生钵苗或裸根苗,株高在40 cm以上、主茎基部直径0.4 cm以上的苗建园。选用的土地一定要被耕翻和平整后才能进行栽苗,且翻耕深度为20~30 cm,需冷量600 h以上^[4]。

4.3 肥水管理

要求蓝莓园有良好的肥水浇灌智能系统,还要求全园做好保湿工作,选用秸秆、稻草、木屑和松针等覆盖,覆盖物厚度不低于10 cm,这样能起到增加土壤有机质和土壤营养物质含量及改善土壤理化性状的作用,栽苗之前需施腐熟好的有机肥。

4.4 病虫害防治

晨雁通过土壤调酸和适当灌溉可以改良叶片失绿现象。晨雁虫害主要有果蝇、蛀干类天牛及鸟类啄食等。发现害虫时及时剪除病虫枝或用白僵菌等生物农药防治。防治鸟类危害,可以放一些稻草人,但最好的办法还是铺设防鸟网。晨雁栽培尽量避免使用农药。

4.5 整形修剪

定植后及时进行定干,高度在0.2~0.3 m^[4]。随着树体的生长,修剪去除一些弱小枝、下垂枝,枯枝,选择强壮枝作为主干枝,以多主干、自然形、丛生灌丛为主,自然状态下每个主枝选择8~10个枝条培

养。同时还要注意修剪枝条,夏季修剪在采果完成后,采用短截与疏除相结合的方式,因该品种成枝力较强,建议多疏除内膛枝条,保证透光度,同时将浓密、瘦弱的花芽剪掉,保留生长健壮的花芽。冬季修剪宜轻不宜重,维持壮芽、壮枝结果。

4.6 防寒措施

北方地区冬季严寒,时有霜冻天气,所以做好果树防寒工作十分重要。该品种因枝条木质化程度较大,所以适宜采用套袋防寒的方式进行越冬。严冬过后,果树处于开花时期时可在园圃中放蜜蜂或配置公爵蓝莓等授粉树以提高坐果率,结果期应去除一些小果或坏果,同时果实膨大期要注意水分的供应。

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