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Technical Standard of International Seabuckthorn Association

团体标准

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鲜食型沙棘品种评价规范

(Standard for evaluation of fresh eating type seabuckthorn cultivars)

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Content

Introduction

This standard is drafted in accordance with the rules of GB/T 1.1-2020 "Standardization Work Guidelines Part I: Standard Structure and Preparation".

This standard is compiled by the International Sea Buckthorn Association.

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1 Range

This standard specifies the technical requirements, identification methods and evaluation of fresh sea-buckthorn variety evaluation.

This standard is applicable to fresh sea-buckthorn varieties.

2 Normative reference documents

The following documents are essential for the application of this standard. For dated references, this standard applies only to the dated version. For undated references, the most recent version (including all amendment orders) applies to this standard.

NY/T 2637 Determination of soluble solids content in fruits and vegetables - Refractometric method

NY/T 2742 Determination of soluble sugar in fruits and products-3, 5-dinitrosalicylic acid colorimetric method

GB 5009.239 National Standard for Food Safety - Determination of food acidity (acid-base titration)

3 Terms and definitions

3.1 Fresh sea-buckthorn varieties

Mature fruit, uniform size, smooth and glossy peel, wrinkle-free, no cracks, high juice content, pure flavor, sweet and sour taste, rich nutrition, can be used as fresh fruit directly to eat, can be promoted in the appropriate area of cultivation of seabuckthorn excellent strains.

3.2 The fresh fruit weighs 100 pieces

The fresh weight of 100 fruits at full maturity, in "g".

3.3 Fruit uniformity

The degree of difference in fruit size is expressed as a uniformity factor (CR) when the fruit is ripe and reaches the size, shape, color, and flavor inherent to the variety.

3.4 Fruit Yield

5a Total fruit mass after ripening of normally growing sea buckthorn plants, unit: "kg/hm^2".

3.5 Peel hardness

The firmness of the peel of a fully ripened fruit, in kg/cm^2.

3.6 Fruit sugar-acid ratio

Ratio of total sugar and total acid content of fruit.

4 Evaluation indicators

100 fresh fruit weight, fruit uniformity, fruit yield, peel hardness, soluble solid content, fruit sugar-acid ratio.

5 Technical requirements and methods

5.1 Evaluate test materials

5.1.1 The planting area of fresh sea-buckthorn varieties must be more than 3km away from grade roads and industrial and mining enterprises, and the site conditions should meet the normal growth and development of sea-buckthorn plants and the expression of traits, and meet the dual organic certification standards of soil and fruit.

5.1.2 The test materials shall be tested regionally to determine their appropriate ecological conditions, planting areas and cultivation management measures.

5.1.3 The test materials shall be the first generation plants with an age ≥5 years and a number of ≥10 plants that have been propagated by cuting, and meet the requirements of strong drought resistance and cold resistance, free of leaf shrinkage disease, dry shrinkage disease (dry branch disease), and other diseases and pests such as sea buckthorn worm.

5.2 Test Method

5.2.1 Test Time

Selection takes place during fruit ripening.

5.2.2 Test location

Test material for planting base.

5.2.3 Test Methods

On-site manual testing, such as observation survey and instrument testing (quick measuring instrument), is adopted.

6 Indicator Test

6.1 100 fresh fruit weight

400 ripe fresh fruits were randomly selected, 100 were weighed by dichotomy, repeated three times, and the weight of 100 fresh fruits was recorded (unit: "g").

6.2 Fruit uniformity

80 sample fruits were randomly selected and 20 relatively large and relatively small fruits, 20 relatively small fruits and 20 relatively large fruits were respectively weighed by the dichotomy method. The ratio of the sum of the two is the fruit uniformity coefficient (CR value), and the mathematical expression is as follows:

$$CR = \frac{\sum_{i=1}^{20} X_i min}{\sum_{i=1}^{20} X_i \, max}$$

CR- fruit uniformity coefficient;

Ximin- 20 relatively small fruit weights in the sample, i=1,2,3... 20;

Ximax- 20 relatively large fruit weights in the sample, i=1,2,3... 20;

6.3 Fruit Yield

Under normal management conditions, 3 to 5 seabuckthorn trees with tree age ≥5a were selected and the fruits were picked manually at the fruit maturity stage. The fruit yield per tree was measured respectively and the average value was taken, and the fruit yield was calculated according to the density (unit: "kg/hm2").

6.4 Peel hardness

Select 3 to 5 sample plants, randomly pick 40 ripe fruits from each plant, and select 10 by dichotomy. Contact the fruit durometer with the fruit surface and press it directly until the peel breaks, respectively read the pressure value, and calculate the average value (unit: "kg/cm2").

6.5 Soluble solid content

From 3 to 5 sample plants, 40 ripe fruits were randomly selected from each plant, and 10 ripe fruits were selected by dichotomous method. The juice extracted from squeezing was dropped onto a handheld refractometer. The recorded data were measured according to the refractometer method of NY/T 2637 determination of soluble solid content in fruits and vegetables, and the average value was calculated as "%".

6.6 Fruit sugar acid ratio

Quantitative ripe fruits were randomly selected, and the sugar and acid content of fruits were determined respectively and the ratio of sugar and acid was calculated according to NY/T 2742 determination of soluble sugar in fruits and products -3, 5-dinitrosalicylic acid colorimetric method and GB 5009.239 National standard for food safety - determination of food acidity (acid-base titration method).

7. Evaluation of fresh sea-buckthorn varieties

7.1 Fresh sea-buckthorn variety evaluation method

7.1.1 Conduct evaluation according to evaluation indicators and standards, and determine the corresponding evaluation code (Table 1). All criteria are positive indicators, and are divided into 3 categories from low to high, medium, high and high, with codes 1, 2 and 3 in order.

Table 1 Evaluation index, standard and code of fresh sea-buckthorn varieties

No.	Evaluation index	Standard	Code and evaluation
1	A hundred fresh fruits weigh（g）	＜30	1：Medium
		30～40	2：higher
		＞40	3：high
2	Fruit uniformity（%）	0.75～0.80	1：Medium
		0.80～0.85	2：higher
		＞0.85	3：high
3	Fruit yield（kg/hm^2）	＜8000	1：Medium
		8000～12000	2：higher
		＞12000	3：high
4	Peel hardness（Kg/cm^2）	2.5～3.0	1：Medium
		3.0～3.5	2：higher
		＞3.5	3：high

5	Soluble solid content（%）	7～10	1：Medium
		10～13	2：higher
		＞13	3：high
6	Fruit sugar acid ratio	1～2	1：Medium
		2～3	2：higher
		＞3	3：high

7.1.2 Under the condition that the evaluation code standard is met, the evaluation indicators are scored respectively and the 100-point system is adopted. According to the status and importance of the evaluation indexes in the evaluation of fresh sea-buckthorn varieties, 100 fresh fruit weight, fruit uniformity, fruit yield, peel hardness, soluble solid content and fruit sugar-acid ratio were given 15 points, 10 points, 20 points, 10 points, 20 points and 25 points.

7.1.3 The total scores of Seabuckthorn varieties participating in the evaluation were calculated and added according to the field measured values of the evaluation indicators (Table 2).

Calculation formula:

$$Y=\begin{cases}\frac{x-b_1}{b_2-b_1}\times A & b_1 < x \le b_2 \\ & b_2 < x\end{cases}$$

Y - Evaluation scores of each evaluation index;

X - Field measurement of each evaluation index;

b1, b2 - lower and upper limits of the standard thresholds of each evaluation index;

A - The maximum value assigned to each evaluation indicator.

The b1 and b2 values of the evaluation criteria in the formula are the comprehensive results of many years of domestic experimental studies on sea buckthorn.

Table 2 Calculation table of evaluation scores of fresh sea-buckthorn varieties

No.	Evaluation index	Codes and standards			Evaluation score calculation				
		1	2	3	A	b_1	b_2	x	Y
1	A hundred fresh fruits weigh（15）	＜30	30～40	＞40	15	30	40		
2	Fruit uniformity（10）	0.75～0.8	0.8 ～0.85	＞0.85	10	0.75	0.85		
3	Fruit yield（20）	＜8000	8000～12000	＞12000	20	8000	12000		
4	Peel hardness（10）	2.5～3.0	3.0～3.5	＞3.5	10	2.5	3.5		
5	Soluble solid（20）	7～10	10～13	＞13	20	7	13		

6	Fruit sugar acid ratio（25）	1～2	2～3	＞3	25	1	3		
Total score	100				100				

7.2 Determination of standard values of fresh sea-buckthorn variety evaluation indicators

From the existing seabuckthorn plantations, six evaluation indexes were determined, the standard values of the fresh seabuckthorn variety evaluation indexes were determined, and the standard scores were calculated (Table 3).

7.3 Identification of fresh sea-buckthorn varieties

According to the standard scores of the fresh sea-buckthorn variety evaluation index (Table 3), the evaluation test materials with a total score of ≥80 could be identified as fresh sea-buckthorn varieties.

Table 3 Standard value and score table of fresh sea-buckthorn variety evaluation index

No.	Evaluation index	Codes and standards			Standard value	Score value
		1	2	3		
1	A hundred fresh fruits weigh（15 分）	＜30	30～40	＞40	36	9.0
2	Fruit uniformity（10 分）	0.75～0.80	0.80～0.85	＞0.85	0.83	8.0
3	Fruit yield（20 分）	＜8000	8000～12000	＞12000	11000	15.0
4	Peel hardness（10 分）	2.5～3.0	3.0～3.5	＞3.5	3.4	9.0
5	Soluble solid（20 分）	7～10	10～13	＞13	12	16.67
6	Fruit sugar acid ratio（25 分）	1～2	2～3	＞3	2.8	22.5
Total points	100 分					80.17
Evaluation standard score						80.0