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青藏高原区沙棘嫩枝扦插技术规程

(Technical regulation of seabuckthorn softwood cutting in alpineplateau regions)

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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 proposed and administered by the International Sea Buckthorn Association.

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This standard is published for the first time.

1 Range

This standard specifies the cutting-raising technology of sea-buckthorn *(Hippophae L.*) in the Qinghai-Tibet plateau, including seedling bed construction, preparation of ho, cutting, water management, fertilizer and drug management, pest control, seedling nursery, file management, etc.

This standard is suitable for cuttage breeding of sea-buckthorn shoots in Qinghai-Tibet Plateau area.

2 Normative reference documents

The following documents are essential for the application of this document. For dated references, the date-only version applies to this document. For undated references, the latest version (including all amendment orders) applies to this document.

DB65/T 3493 Technical regulations for cuttage raising of green branches of sea buckthorn

DB14/T 1697 Technical specification for cuttage breeding of sea buckthorn

GB/T 6001 Seedling technical regulations

3 Terms and Definitions

3.1Shoot cut Softwood. Shoot cut softwood

Semi-lignified branches at the peak of their growth.

3.2Softwood cutting of young branches

The method of propagating cuttings using semi-lignified branches of the current year as cuttings.

3.3Sea buckthorn in alpineplateau

Sea buckthorn in the Qinghai-Tibet Plateau mainly refers to the sea buckthorn growing and distributing in the area above 3000m and the average annual temperature is 5℃ ~ 16℃. They mainly include *Hippophae gyantsensis* (Rousi) Y. S. Lian, *Hippophae rhamnoides subsp. Turkestanica* Rousi and *Hippophae rhamnoides subsp. yunnanensis* Rousi, *Hippophae rhamnoides subsp. sinensis* Rousi, and *Hippophae salicifolia* D. Don) etc.

4. Seedling bed construction

4.1 Greenhouse Construction

Choose the leeward, sunny, low water table area to build seedling greenhouse. The covering material of the roof of the shed is glass with a light transmittance of more than 90%, and the top of the greenhouse is provided with an electric window. The two end faces and sides of the greenhouse are equipped with aluminum profile sliding Windows, casement Windows or ouverting Windows.

4.2 Nursery bed laying

The width of the seedling bed is 90cm, and the length is determined according to the land condition in the greenhouse. The nursery bed is first laid with a layer of good water permeability slag, the thickness of about 10cm, and then a layer of humus soil 2cm thick, evenly spread a layer of N, P, K compound fertilizer, the amount of application is about 22g/m2, and the top layer is laid with a layer of moderate thickness and washed clean river sand, the thickness of 7 ~ 10cm. The seedbed is about 20cm higher than the ground in the shed, forming a high seedbed to ensure the permeability and water drainage of the seedbed.

4.3 Sprinkler irrigation construction

Spraying irrigation equipment with better atomization effect should be selected, and it has the functions of automatic spraying irrigation and manual adjustment of time and frequency. Specific in accordance with the "DB65/T 3493 big fruit sea buckthorn green branch cutting seedling technical regulations" implementation.

4.4 Nursery bed disinfection

The seedling bed was levelled before cutting and disinfected with 5% potassium permanganate solution (20% carbendazim powder) 1d before cutting. After washing with water, a soil closing herbicide (20% fruit herbicide) is sprayed to reduce the amount of manual weeding work in the later stage.

5 Preparation of cuttings

5.1 Cuttings collection

Select the semi-lignified branches of the current year without pests and diseases and good growth as cuttings. The harvesting time should generally be completed before the dew dries in the morning to keep the water content of the leaves sufficient. The best collection time is from late June to early mid-July each year.

5.2 Cuttings storage

With the harvesting of ear with cutting, and cut the lower end of the branches soaked in water; If you need to transport overnight, keep moisture by spraying every 4h to 5h during transport, and do not soak in water for storage.

5.3 Cuttings pruning

Before pruning cuttings, wash them with water to remove dust and impurities from branches and leaves to prevent them from carrying germs.

Cuttings are pruned indoors or in the shade. The diameter of the ear is 0.25cm ~ 0.35cm, the length of the cuttings is 12cm ~ 15cm, the lower end of the cuttings is cut into a diagonal, the upper end is flat (no growing point branches), and the growth point (secreting auxin) is retained as much as possible during pruning, so that it is appropriate to retain 1 to 3 growing points. The number of cuttings retained should be adjusted according to leaf size. 5 ~ 7 leaves should be retained for cuttings with larger leaves such as *Hippophae gyantsensis* (Rousi) Y. S. Lian and *Hippophae rhamnoides* subsp. *yunnanensis* Rousi, and 7 ~ 10 leaves should be retained for cuttings with smaller leaves such as *Hippophae salicifolia* D. Don. The leaves should be cut in the direction of leaf growth (from the lower end of morphology to the upper end of morphology) to avoid damaging the cuttings cortex.

5.4 Cuttings treatment

The cuttings were tied into a bundle of 50 or 100 roots, placed in a flat bottom basin, disinfected with 500 times liquid of 25% carbendazim wettable powder, and then soaked in rooting agent "Genbao 3" for 10s to 15s to cut the cuttings, and the cuttings should be fully soaked during soaking.

6 Cutting

6.1 Cutting time

Cutting time is 6:00 ~ 10:00 in the morning or 17:00 ~ 21:00 in the afternoon from late June to early mid-July.

6.2 Cutting holes

Before cutting, the substrate is treated flat, the middle is slightly higher than both sides (easy to drain), the substrate is watered, and the hole punch or other objects are drilled in advance (hole depth of 4cm ~ 5cm, hole distance of 5cm×5cm) to avoid damage to the cutting cut and skin.

6.3 Cutting method

Insert the pruned cuttings into cutting holes, fill the holes with matrix, and fill them with light pressure. The cutting depth should be 1/3 of the length of cuttings.

7 Water Management

7.1 Water Spraying Principle

After cutting, the water demand of each stage is different, and the water demand of different weather conditions should be adjusted accordingly. It is necessary to observe the temperature in the shed frequently, and if the temperature is too high, it is necessary to open the ventilation system of the greenhouse to maintain ventilation, and it is not possible to spray a large amount of water to achieve the purpose of cooling. If water demand is large, stop 2min ~ 3min, spray 60s; When the water demand is large, stop for 2 min ~ 3 min and spray for 35 s; When the water demand is moderate, stop for 4 to 5 minutes and spray for 60 s; At night, it can stop for 1 h ~ 2 h and spray for 60 s.

7.2 Water spraying at different stages

When cutting, if too many cuttings cannot be inserted in a short time, it is necessary to spray the cuttings that have not been cut and the cuttings once for 10min (the spray time and frequency should be adjusted according to the weather and temperature) to avoid the water loss of cuttings.

After cutting, immediately spray water once, after the principle of "a small amount of times" should be followed, so that the leaf surface always maintain the state of water film is appropriate.

The amount of water spraying should not be too much, but the humidity should not be low (more than 95% is appropriate).

After cutting, the water demand was different at different stages. 1d ~ 10d: the growth of proliferative tissue, more water demand, stop for 2 min ~ 4 min, spray for 60 s, assuming that there is often water film attached on the leaf surface; 10d ~ 20d: stop for 3 min ~ 5 min, spray for 40 s, the moderate moisture is determined by the moisture of the leaf surface; 20d ~ 30d: stop for 4 min ~ 6 min, spray for 60 s, combined with the specific rooting situation, the water demand becomes less, watering frequency should be combined with the substrate humidity and atmospheric temperature; After 30d: it can be stopped at night for 2 h ~ 3 h, spraying for 60 s, rooting tends to be stable, and the number of water spraying is reduced.

8 Fertilizer drug management

8.1 Fertilizer Management

After 30 days of insertion, nutrient solution (0.15% urea + 0.1% potassium dihydrogen phosphate mixture) was sprayed every 7 days in the evening, 3-5 times, the dosage of 0.1 kg/m2 each time, and fertilization was stopped before mid-September.

8.2 Drug Management

Spray 500 times carbendazim (N-(2-benzoimidazolyl) carbamate or Bordeaux solution once every 7 days in the evening to prevent brown cutting.

9 Pest control

Some cuttings themselves will carry harmful organisms of the mother tree, and adopt comprehensive control of physical, chemical and biological. Pest control is carried out in accordance with the requirements given in Appendix A.

10 Nursery stock

10.1 Nursery grading

The classification of shoots I and II shall be carried out according to DB14/T 1697 Technical Regulations for cutting-breeding of sea buckthorn Seedlings.

10.2 Planting

Grade I and II seedlings are directly released to the nursery. Use a mechanical single plow to lift the seedlings and minimize root damage. Shorten root exposure time as much as possible after seeding. If planting cannot be completed on the same day, it is best to temporarily plant the

remaining seedlings to protect the roots. If seedlings need to be transported for long distances, they should be loaded as soon as possible and the root system should be moisturized. After installation, cover with rain cloth and tie tightly to prevent wind and moisture, and take with planting. Seedlings transported to the scene can not be planted in time, should be faked.

11 File Management

Establish seedling technical management files, specifically refer to the "GB/T 6001 seedling technical regulations" implementation.

Annex A(Information Appendix)

Main pest control methods for cuttings of sea-buckthorn shoots

Table A Main pest control methods for cuttings of sea-buckthorn shoots

Pest	Main control measures
Leaf rot (bacterial disease)	Generally, it begins to appear after 10d of cutting, which is a bacterial disease, and can be sprayed for prevention at 7d-8d after cutting. Drugs: Metalaxyl, oxametrin and metalaxyl should be used alternately. Spray on the leaf surface when using, do not wash after spraying.
Root rot	Generally, it begins to appear 20 days after cutting, and is a fungal disease, often caused by excessive water in the matrix. Spraying can be carried out on 15d after cutting, and spraying can also be carried out on 3d-5d after cutting to prevent black and rot of the cutting edge. Drugs: Metalaxel • Manganese zinc, oxamex • Formethanol. After spraying on the leaf surface, rinse to the root.
Viral disease (lobular disease)	Leaf disease is a kind of disease carried by cuttings themselves, which mainly shows that the growing points are clustered and do not grow. After taking root, if the plants are in high temperature and high humidity environment for a long time, leaf disease is easy to cause. Drug: oligosaccharides • chain protein + amino-oligosaccharides. Do not wash after spraying on leaf surface.
Insect attack	Insect pests are generally carried from the mother tree, and should be prevented and managed according to the specific situation. Drug: Deltamethrin.