

The use of prolonged fertilizers for vegetative reproduction of *Prunus salicina* in the conditions of the Krasnoyarsk forest-steppe

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Abstract. The article examines the influence of Osmocote Exact Standard fertilizers on the biometric parameters of Chinese plum (*Prunus salicina*) saplings of varieties Pyramidalnaya and Altayskaya Jubileinaya during vegetative propagation (by the method of winter grafting) in the Krasnoyarsk forest-steppe conditions. The use of prolonged fertilizers when growing plum planting material has a positive effect on the development of biometric parameters of the aboveground and underground phytomass of plants: the average number of shoots in the variant with long-acting fertilizers was 2.7-3.0 pcs. An increase in the average length of shoots was recorded in the variants using Osmocote - 15.9-18.1 cm, these indicators are 2.9-8.7 cm higher than the control variants. Application of prolonged fertilizers had a favorable effect on the growth and development of the root system of plum seedlings: average the number of roots of the 1st branching order was 9.7-12.7 pcs, the average length of the roots of the 1st branching order was 9.4-10.3 pcs.

1 Introduction

In the gardens of Siberia, stone fruit crops are becoming more widespread [1; 2]. Chinese plum is characterized by frost resistance, high potential yield, lack of periodicity of fruiting, nutritional value [3].

In modern fruit growing, special attention is paid to the quality of the used planting material. The time of the entry of the fruit plantation into the fruiting period, the rate of increase in yield, the payback of capital costs depend on the quality indicators of seedlings [4]. It is possible to grow one-year standard plum seedlings when using intensification elements, for example, using prolonged fertilizers [5; 6].

The aim of this work is to study the effect of Osmocote prolonged fertilizers on the biometric parameters of the Chinese plum.

2 Materials and methods

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The experiment was carried out in 2020 at the phyto-site of the Department of Plant Production, Breeding and Seed Production of the Krasnoyarsk State Agrarian University. The objects of research were winter grafting of Chinese plum, which was carried out in laboratory conditions at a temperature of 18-20 ° C in March. Vaccinations were carried out using the "improved copulation" method. The junction of the components was tightly tied with ribbons of polyvinyl chloride film 1 cm wide. The grafted cuttings were waxed with molten paraffin at a temperature of 55-65 ° C. Sand cherry (*Cerasus bessyi*) served as stock in the experiments. Chinese plum was used as a scion - varieties *Pyramidalnaya* and *Altayskaya jubilee*. Before planting in open ground, the grafts were stored at a temperature of 0 ... -2 ° C until a "green cone" appeared at the scion. They were planted by hand so that the strapping was just above the soil surface. Planting scheme 40 × 40 cm. Before planting, Osmocote fertilizer (manufacturer Everris (ICL), Netherlands) was applied at a dose of 2.5 g / l of soil. The fertilizer was used in one modification (%): Osmocote Exact Standart (N-16, P-9, K-12, Mg-2; B-0.02, Cu-0.031, Fe-0.09, Mn-0.06, Mo-0.014, Zn-0.015). Osmocote is characterized as a third generation fertilizer that provides the plant with nutrients throughout the entire growth period - 3-4 months. The experiment was repeated 3 times, the placement of variants and replicates was systematic. Options: 1) control (without fertilizers); 2) Osmocote Exact Standart. The experiments, observations and counts were carried out in accordance with the "Program and methodological guidelines for agrotechnical experiments with fruit and berry crops" [7]. The quality of the planting material was determined according to GOST R 53135-2008 "Planting material of fruit, berry, subtropical, nut, citrus and tea crops" [8]. Statistical processing of the obtained experimental data was carried out by the method of analysis of variance [9].

3 Results and discussion

The biometric parameters of Chinese plum saplings of varieties *Pyramidalnaya* and *Altayskaya Yubileynaya* on the Osmocote Exact Standart variant differed from the control - the plants showed a positive response to the application of long-acting fertilizers (Table 1).

Table 1. Influence of fertilizers with prolonged action on the biometric parameters of Chinese plum seedlings, September, 2020

Options	Average number of shoots, pcs	Average length of shoots, cm	Average number of roots, pcs	Average root length, cm
<i>Pyramidalnaya</i>				
1. Control	2,8	9,4	6,2	8,8
2. Osmocote Exact Standart	2,7	18,1	9,7	9,4
<i>Altai jubilee</i>				
1. Control	2,5	13,0	11,0	7,3
2. Osmocote Exact Standart	3,0	15,9	12,7	10,3

In the *Pyramidalnaya* variety, the obtained parameters of the aboveground and underground phytomass of plants when applying long-term fertilizers are higher relative to the control. The average length of shoots was 18.1 cm and exceeded the control by 8.7 cm. The indicators of the average number of shoots in the control variant and when fertilizing with Osmocote were practically at the same level: 2.8 pcs (control), 2.7 pcs (Osmocote) ... The average number of main roots in the variant with the use of prolonged fertilizers was 9.7 pieces, which is 3.5 pieces higher than the control plot. The use of Osmocote Exact

Standard fertilizers increased the average root length - 9.4 cm (HCP = 3.0), while on an unfertilized plot the studied indicator was 8.8 cm.

The average length of shoots in the Altayskaya Yubileynaya cultivar was 15.9 cm and exceeded the control by 2.9 cm. The indicator of the average number of shoots when applying Osmocote fertilizers slightly exceeded the control (by 0.5 pcs). The average number of main roots in the variant with the use of prolonged fertilizers was 12.7 pieces,

4 Conclusion

Thus, the use of prolonging fertilizers Osmocote Exact Standart when growing planting material of plums by the Chinese method of winter grafting has a positive effect on the development of biometric parameters of the aboveground and underground phytomass of plants.

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