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Communication paper

THE PECULIARITIES OF SEA-BUCKTHORN PROPAGATION WITH GREEN CUTTINGS

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In the Asian region the particular importance belongs to the sea-buckthorn (Hippophae rhamnoides L.). Rapidity, high yield, regular fruiting, winter hardiness of plant determine its priority in the fruit agrocenosis in the extreme soil and climatic conditions. Sea-buckthorn berries are a unique natural multivitamin, as well as a source of high-value sea buckthorn oil that provides the value of the culture for obtaining food and medicinal raw materials [1, 2]. Planting material of sea-buckthorn berries is always in demand. Over the past 25-30 years in this region the number of industrial fruit nursery gardens has reduced, so it is necessary to increase the efficiency of reproduction in order to ensure the need for seedlings of this culture. In the modern nursery gardens sea-buckthorn is propagated with woody and green cuttings. However, the most effective method of reproduction is with green cuttings [3,4]. At the same time, it should be noted that the rooting of green cuttings in the cultivation facilities takes place under the washing type of water regime, which leads to the leaching of nutrients from the substrate. Increase of the yield and quality of seedlings requires higher doses of fertilizers, which adversely affects the environment and often leads to the irrational use of fertilizers. Therefore, it is necessary to use long-acting fertilizers in the technology of green cuttings. One of these types of fertilizers is natural zeolite. Due to the peculiarities of the structure, zeolites have a unique combination of prolonged adsorption, cation-exchange, catalytic properties, biological activity, which allows to create mineral and organic-mineral fertilizers on the basis of zeolite and widely use them in agriculture. Zeolites are able to retain basic nutrients in their channels, gradually transfer them to the soil solution, preventing soil contamination and prolong the effect of fertilizers [5]. Russia, Mongolia and some other countries have large reserves of natural zeolites [6,7]. In our experiment, on the example of sea-buckthorn varieties “Chuiskaya” it was proved that the rooting of cuttings when introducing the substrate of the zeolite from Chaplinskaya deposits in Krasnoyarsk Territory, enriched with mineral fertilizers in the dose of $N_{30}P_{75}K_{30}$ (dose of 2 t/ha) is by 25,8% higher than in the control group, by 6,7% is more effective than mineral fertilizers in the analogical dose and by 12,3% is more effective than in the variant which used fertilizers of prolonged action AVA – $P_{75}K_{30}$ together with N_{30}. The highest yield of standard seedlings – 50,5% – was obtained when growing seedlings further at the site of green cuttings rooting on the substrate with enriched zeolites. Also, in order to increase the rooting of sea-buckthorn green cuttings, it is advisable to use sapropel as a substrate or the substrate component. The benefits of sapropel are predetermined by the increased content of some nutrients for plants, they are extremely rich in nitrogen compared to other organic fertilizers, contain antibiotics that prevent the development of pathogens, in addition, they are long-acting fertilizers [8]. Comparative assessment of substrates: sapropel (the deposit of Small Kyzykul in Minusinskiy district of the Krasnoyarsk Territory) and low-lying peat (the deposit Tigritskoye in Minusinskiy district of the Krasnoyarsk Territory) + sand in volume ratio 1:1 showed the advantage of sapropel in the rooting of green cuttings of varieties of sea-buckthorn “Chuiskaya” and “Businka” (Fig. 1). However, when using the technology of further plants growing on the site of rooting of cuttings, sapropel substrate is not as effective as peat substrate. In the market of agrochemical raw materials the upper peat is more available, but its use for breeding of berries is limited to high acidity.

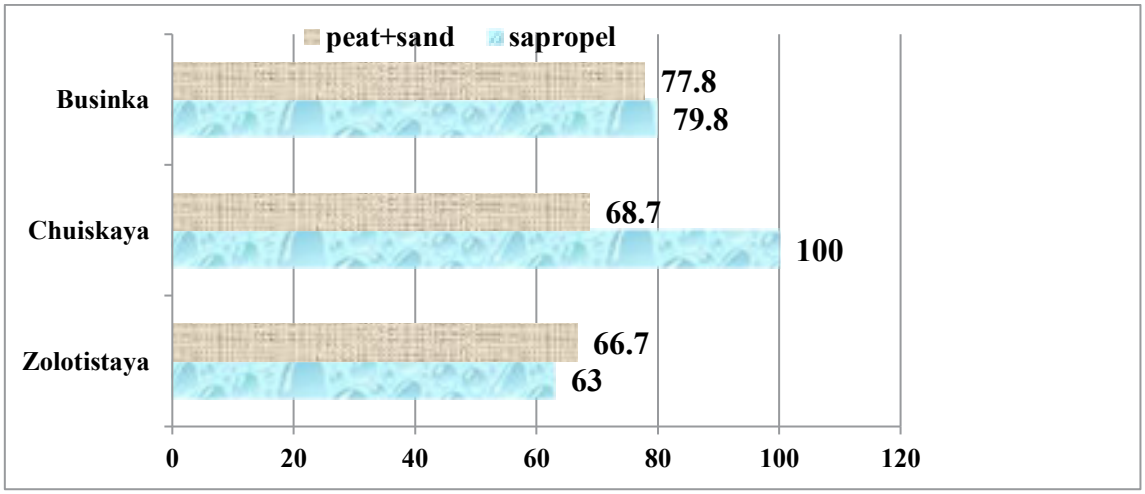

Figure. 1. The effect of substratum composition on the rooting of green cuttings of sea-buckthorn, %.

In the experiment we used upper peat with a pH of 3,1 in the mix with river sand in volume ratio 1 : 1 (control). In order to reduce the acidity of the substrate, enriching it with nutrients, sapropel of the Small Kyzykul Deposit was introduced at the rate of 10, 15 and 20 t/ha (options 2-4). In variants 5-8, ammonium nitrate was additionally introduced at a dose of 30 kg per ha (Fig. 2).

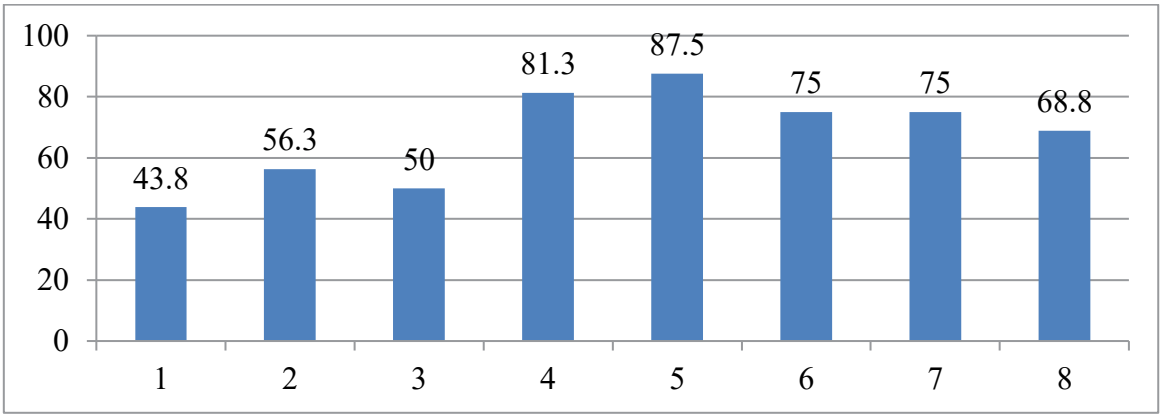

Fig. 2. The effect of substratum composition on the rooting of cuttings of sea-buckthorn varieties "Jamovaya"

Symbols: 1-peat + sand; 2-peat + sand + sapropel 10 t / ha;
3-peat + sand + sapropel 15 t / ha; 4-peat + sand + sapropel 20 t / ha; 5-peat + sand + N30; 6-peat + sand + sapropel 10 t / ha + N30; 7-peat+sand + sapropel 15 t / ha + N30; 8-peat+sand + sapropel 20 t / ha + N30

The addition of sapropel had a positive effect on the rooting of green cuttings of sea-buckthorn varieties of "Jamovaya", increasing the rhizogenesis by 6,2 – 37,5%.

Thus, the use of zeolites and sapropel can improve the effectiveness of green cuttings of sea-buckthorn.

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