EFFECT OF MINERAL FERTILIZERS AND SANDING ON THE GROWTH OF CRANBERRY ON PREPARED PEAT LANDS

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The results of the impact of fertilizers and sanding on growth and survival of large cranberry on prepared peat lands. Defined annual growth of vegetative shoots, depending on the scheme of fertilization and sanding.

Cranberry, prepared peat lands, vegetative shoots, fertilizers, survival, sanding.

In Western Ukraine Polessya there are many kinds of wild berry plants (blueberries, cranberries, blueberries, blackberries, raspberries, etc.). One of the most valuable plants are cranberry, its berries are widely used in food, home cooking, and find versatile use in both science and in medicine.

Cranberry is characterized by a high content of physiologically active substances, organic acids, pectin, vitamins and microelements. Cranberries remarkably well preserved very fresh, and it is convenient to transport [2].

Note that cranberry is of great importance for supply of food for wild birds and animals, including those of representatives of forest fauna as capercaillie, black grouse, fox and bear. Berry place is home of many birds nesting and living rodents. Important is the role of birds in spreading the fruits and seeds. Eating berries, undigested seeds falling in favorable conditions germinate and eventually sprout new plants. Experts have marked close relationship between the increase in the number of individual animals and harvest of berry field [2].

Unfortunately, over the past 50 years, the fields of berries, including cranberries, was significantly reduced, and the volumes of harvesting berries were reduced. This is explained by low biological productivity of wild cranberries and shortage of natural berry fields because of drainage of swamps carried in 60s [4]. Drained swamps and prepared peat lands occupy large areas in West Polessye in Ukraine, Belarus and Poland.

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Due to the high acidity and low fertility of the land they rarely used, or indeed are unsuitable for growing crops. Therefore, peat lands are exposed to various adverse natural phenomena and degraded, which in turn does not bring any good state, but rather prejudice.

Currently the resolution in this situation that happened here - it is growing of cranberries on industrial plantations. This will ensure that the needs of the people are met, reduce the pressure on wild berries fields and allow efficient use of drained peat bogs and peat bogs.

The purpose of research. Determine the effect of fertilizers on growth and sanding cranberries produced on large-peat.

Materials and methods. Research object is cranberry Large called Bergman planted at 18 research sites (3x5m) on peatlands SE "Volyntorf" that are near Manevitch district, Volyn region. Biometric parameters of cranberry plants were determined according to conventional methods [1].

To lay the experiments area of peat was chosen, a total area of 0.5 hectares. In autumn 2012 the area was prepared for the planting and aligned divided to 18 sites, 12 of which were covered with a layer of medium sand thickness of 5-7sm. In April 2013 the area was supplied with irrigation system. At a depth of 40sm pipeline was laid that brings water to the 6 injectors pulse action, ensuring all irrigation areas. To remove weeds and shrubs herbicide treatment "Roundup" was used and weeding were carried out.

Planting material was procured near v. Sekun Volyn region and plastic bags of sphagnum moss delivered to the experimental area. Till planting, shoots of cranberry kept in the shade and watered once a day with water, which made it possible to keep them in good condition within 20 days.

Stems 14-20sm length of large cranberry planted by hand for 1-2 pcs. into the hole. With help of dibbling plate the stems were pushed in to such a depth that the top was no more than 2-3sm.

Immediately after planting, area was watered (2-3 times a week) to saturation of soil moisture. Over the next three weeks after planting area was regularly watered. Three weeks after cranberry shoots rooted and started to grow.

Results. Three schemes was worked out of landing sites № 1-12, (20x20sm), № 13-15 (10x10sm), № 16-18 (30x30sm). Data on the survival of cranberry shown in Table 1.

Table 1

Survival of cranberry shoots

Number pad	Planted, pcs.	Not stuck, items.	Stuck, items.	Survival rate,%
1	432	53	379	87.7
2	420	87	333	79.3
3	464	61	403	86.9
4	459	65	394	85.8
5	435	92	343	78.9
6	435	63	372	85.5
7	435	21	414	95.2
8	448	79	369	82.4
9	435	49	386	88.7
10	416	25	391	94.0
11	420	83	337	80.2
12	448	53	395	88.2
13	940	96	844	89.8
14	846	156	690	81.6
15	390	46	344	88.2
16	190	23	167	87.9
17	170	34	136	80.0
18	180	22	158	87.8

Analyzing the data in Table 1 it can be concluded that the average survival rate of cranberry is 86%. The scheme of planting doesn't effect on survival in the first year. It only affects the speed of closing of the plants, because the more rarely plants are planted, the later they will close and the lower harvest will be in the first years of fruiting.

These experiments have shown that cranberry shoots best rooted on sanded areas. Survival on platforms covered with a layer of sand 5-7sm, proved by 5-10% higher than those not sanded. (Fig. 2). It should be noted that the area is not covered with a layer of sand overgrown with weeds. Weeding was complicated because with the weeds struggle turf was pulled out and it violated the integrity of the substrate and cranberry plants were damaged. On the contrary sanding areas

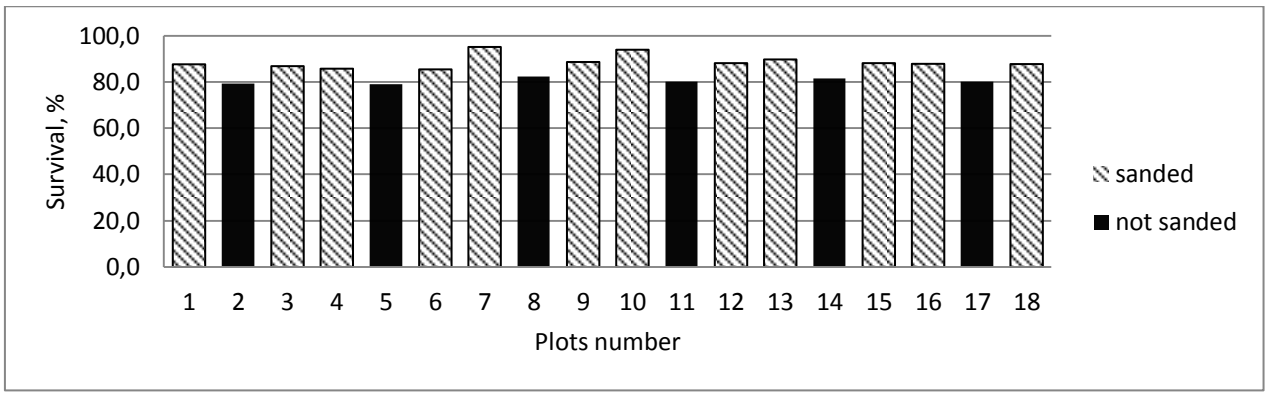

Figure2. Effect on survival sanding cranberry

weeds were few and they were easily disposed during weeding.

Cranberries - oligotrophic plant, not very demanding to the nutrient content of the soil, this allows it to grow in natural conditions on the swamps poor in minerals [3]. Studies by many authors [2,4,5] agree that the most positive impact on the growth of cranberries has nitrogen, phosphate and potash fertilizers. With the aim of finding optimal doses of fertilizers we have incorporated the following experiments circuit $N_{30} P_{30} K_{30,} N_{60} P_{60} K_{60,} N_{90} P_{90} K_{90}$ and the control (no fertilizer). Three weeks after planting at 9 sites the fertilizers mentioned above were introduced at the rate of 30, 60 and 90 kg / ha. During the growing season we have observed that in areas where there were large-fruited cranberry fertilizer plants differed larger size leaves, brighter color than the sites where they were not used. At the end of the growing season for each variant measurement was made of the length of the vegetative shoots of cranberry plants, results are given in Table 2.

Table 2.

Average annual growth of vegetative shoots cranberry variety Bergman in 2013., sm

Number of areas	1	2	3	4	5	6	7	8	9	10	11	12
Mean value	20,3	18,5	21,7	23,3	21,8	19,5	23,6	23,8	25,7	19,7	12,3	19,5

After analyzing the data held records we concluded that the dependence of cranberry shoots directly proportional to the number of fertilizers in the soil (Fig. 3). So the first version where fertilizers were introduced at the rate of 30 kg / ha, the average length of shoots varies about 20 sm in the second embodiment, the amount of nitrogen, phosphorus and potassium were doubled, but not significantly increased growth on some sites it remained at the same level, as in the first

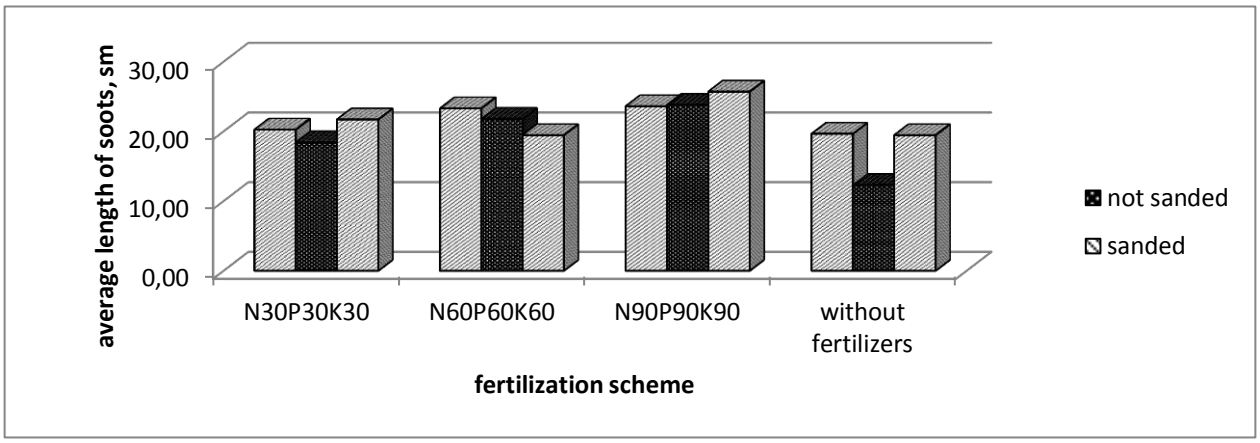

Figure 3 The growth of shoots cranberry depending on the amount of fertilizers

embodiment.On platforms № 7, 8, 9 fertilizers were made on the basis 90 kg/ha. This version recorded the highest growth rates. Compared with control plots where no fertilizers were introduced in all other embodiments, an increase in growth with increasing doses of nitrogen, phosphorus and potassium. Is most clearly evident on non sanded platforms in areas covered by a layer of sand increasing growth is not clearly expressed. This is because the sand is a bit slow action fertilizer.

When growing cranberries problem weeds is one of the most important. Because fertilizers can stimulate weed growth, some authors do not recommend their use in plantation grown cranberries, at least in the first years after planting [5]. After fertilization we observed intensive weed growth, but this applies only to not sanded sites. On a platform covered with a layer of sand germination of weeds did not increased, but remained at the same low level as before fertilization.

So summarizing all of this we can say that increasing the number of mineral fertilizers increased annual growth of large cranberry shoots. However, some authors [4] warn that introducing large amounts of nitrogen, phosphorus and potassium contributes to the development of autonomic than generative shoots that may affect productivity, so this dosage permissible only in the early years, the next stages of fertilization scheme has to change.

Conclusion. Studies have shown that the average survival rate of cranberries produced on large-peat is 86%. The scheme of planting material doesn't effect on survival in the first year has not. Survival on platforms covered with a layer of sand 5-7sm, proved by 5-10% higher than for non sanded areas. Sanding reduces growth of weeds in areas with cranberries and helps to pull out the weeds. Number of

fertilization in the first year in direct proportion increases the growth of the shoots in cranberries.

LITERATURE:

1. Карпенчук Г.К., Обліки, спостереження, аналізи, обробка інформації в дослідах з плодовими та ягідними рослинами / Г.К. Карпенчук, А.В. Мельник. –Умань, 1987. –60 с.
2. Черкасов А.Ф. Клюква на садовых участках. Издательско-полиграфическое предприятие «Кострома», РИО, г.Кострома, 2001 г.- 72 с.: ил.
3. Кудинов М.А., Шарковский Е.К., Освоение культуры крупноплодной клюквы в Белоруссии, «Наука и техника» Мн., 1973 г., –80 с.
4. Сидорович Е.А., Кудинов М.А., Рубан Н.Н., Шерстеникина А.В., Рупасова Ж.А., Шапиро Д.К., Горленко С.В. Клюква крупноплодная в Белоруссии. – Мн.: Наука и техника, 1987. – 238 с.
5. Методические рекомендации по применению минеральных удобрений на плантациях ягодников семейства брусничных до периода плодоношения (для опытно-производственной проверки). М., ВНИИ лесоводства и механизации лесного хозяйства , Белорусский научно-исследовательский институт лесного хозяйства Гослесхоза СССР, 1986, – 22 с.