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ON THE METHOD OF FORMATION OF REJUVENATED PASTURES OF PROTECTIVE FOREST BELTS FROM BLACK SAXAUL (HALOXYLONAPHYLLUM (MINKW.) ILJIN.) IN KYZYLKUM SANDY DESERT

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ABSTRACT:

The article presents the research results on the formation of rejuvenated pasture protective forest belts from black saxaul (Haloxylonaphyllum (Minkw.) Iljin.) in the desert zone of the South-Eastern part of Kyzylkum. Experimental work was carried out to develop methods for the black-saxaul pastures restoration of protective forest belts, losing their protective functions. The main goal of the work was to form protective forest belts from growth after saxaul felling by leaving a different growth number on the stumps.

Keywords: saxaul, strip, pasture, undergrowth, growth, stump, survival rate, height, crown, rejuvenation, reforestation, felling.

INTRODUCTION:

Artificially created forest plantations from black saxaul affect the desert pastures protection from adverse weather conditions (summer heat and winter cold) render within 20-25 years. Then the black saxaul plantations grow old; sharply reduce the fruiting intensity and the ability to grow growth, self-expressing due to drying out, specific individuals windfall and lose their protective functions. The restoration technology and terms (rejuvenation) of black saxaul pastures of protective plantations that are losing protective functions are poorly studied. In this regard, it became necessary to provide scientific methods substantiation for the rejuvenated pasture shelter plantations formation. To accelerate growth height on black saxaul stumps and quickly reach their height to the parent plantings work was carried out to remove weak, stunted growth, leaving larger, healthy growth. For this, three experience options were laid: in the first option, the more developed 3 growths were left, in the second and third options, 6 and 9 growth. As a control, stumps were left without growth removal. These control stumps had 40-60 growth in the first year. Over the three years course, observations were made from growth, growth acceptance in all experience options.

According to a number of [1; 2; 3; 4; 5; 6] authors up to 100 growth appears on stumps of 20- and 22-year-old trees, and for 5- and 10-year-olds up to - 30 pieces with an increase in saxaul age, the stumps percentage that have given growth decreases.

RESEARCH METHODS:

Field and laboratory studies have been carried out. Growth height was measured at each growing season end using laths, stump diameters using a measuring batten the growth rate was determined, plant crown diameters, growth thickness. The number of measured plants in each option was 100 pcs. The obtained materials were processed by the

variation statistics method. The projection area of the bushes crowns and the fodder mass of the plants were also determined. For each option, it was determined the plants number that appeared by natural self-growth. The received digital materials were drawn up in the tables form and used for analysis.

RESULTS AND REVIEW OF RESEARCH:

Measurements of two-year-old stumped growth showed that their height was 204.2 ± 4.36 cm, (control without growth removal) and 220,6±6,16 cm (second option), on the third option – 213,3±4,72 cm (Table-1).

Table 1. Biometric indicators of biennial growth of black saxaul in the pasture of protective forest belts (Karakul hospital)

Options	Growth quantity, pcs	Growth height, cm	Growth crown diameter, cm	Growth diameter, cm	Stump diameter, cm
1	3	208,8±4,32	126,6±3,07	2,52±0,06	11,28±0,44
2	6	220,6±6,16	137,8±4,46	2,87±0,06	12,17±0,51
3	9	213,3±4,72	138,2±3,36	2,45±0,05	9,95±0,25
4 (control)	60	204,2±4,36	149,2±4,89	2,45±0,08	9,65±0,39

The control crown diameters had the greatest value is 149.2 ± 4.89 cm, in options 1, 2 and 3 is respectively 126.6; 137.8; 136.2 cm. The growth thickness ranged from 2.45 to 2.87 cm.

In the third year, the growth was 223.8 - 258.0 cm, and in the control option it was 13 - 48 cm lower. In the first option with three growths, the growth height was significantly higher than in the other options; the crowns diameters in the control option had higher values (156.2 ± 3.8 cm) than in the other options (table-2).

Table 2. Growth rates of three-year growth by experience options

Options	**Growth amount on the stump**	**Growth height, cm**	**The diameter of the growth crown, cm**
1	3	158,0±6,3	114,0±4,6
2	6	245,0±4,8	125,4±4,9
3	9	223,0±5,1	134,6±3,9
4	60	210,0±6,5	156,2±3,5

Observations of the leaves state on the stumps showed that the more there were leaves on each stump, the less they suffered from strong winds. For example, in the option with 3 growths, the number of saxaul bushes damaged by the wind (broken by the wind) was 42.1%, on the second and third options were 34.3 and 21.3%, respectively, on the control option was 6.4% (table-3).

Table 3. The structure of the rejuvenated three-year-old pastures of the protective forest belts of black saxaul (number of elements making up pasture forest strips per 100 linear meters of strips, pcs)

№	**п.з.л.н. elements**	**Growth quantity on the stump, pcs**			
		3	**6**	**9**	**Control 20-40 pcs**
1	Number of dry stumps	28	22	20	11
2	Number of stumps where the wind is broken 1-2 growth	83(42%)	38(34%)	40(21%)	12(6,4%)
3	The number of stumps where the growth is completely broken by the wind	3	1	0	0
4	Saxaul undergrowth	2600	4333	2167	3033
5	Number of live rejuvenated saxaul bushes	197	198	188	199
6	Average crown diameter of rejuvenated saxaul bushes	114	125	134	156
7	The area of the projection of the crowns of bushes, m^2	201	243	265	380

In the forage vegetation formation on the experiment options, 5-10 species of herbaceous semi-shrubs and shrubs were taken, which seeds came from nearby pastures. These plants include black saxaul, syrian bean-caper, wild rue, convolvulus divaricatus, guzium heliotrope, alhagi, astragalus , halothamnus subaphyllus and S. sclerantha. Bushes of calligonum, salsola richteri and other plants were found occasionally. In the first

option, the fodder weight of plants was 458.3 kg/ha, in the second and third options, respectively, 597.0 and 1071 kg/ha, and in the control 1723.5 kg/ha.

After reaching the growth three years old, the fodder mass of plants increased significantly and amounted to 664.9 in the first, second and third options; 683.9; 895.5 kg/ha, and in the control 1041.0 kg/ha. Due to wider crowns, the fodder weight of rejuvenated black saxaul bushes with three-year growth in the third option and control was significantly higher than in other options (table-4).

Table – 4. Forage weight of plants on options with 3-, 6- and 9-year-old 3-year growth on each option (kg/ha)

№	Plant name	Experience options			
		1	2	3	Control
1	Black saxaul	132,6	478,3	593,0	696,3
2	Alhagi	469,1	166,6	62,0	333,4
3	Syrian bean-caper	63,2	-	106,3	-
4	Halothamnus subaphyllus	-	39,0	127,1	-
5	S. sclerantha	-	-	7,1	11,3
	Total	664,9	683,9	895,5	1041,0

Observations of the self-overgrowing of desert vegetation in the experimental plots showed that ten plant species participated in the formation of the plant community. Among woody plants, there were one- and two-year-old black saxaul plants with an amount from 7333 pcs / ha to 19333 pcs / ha, of the shrubs were halothamnus subaphyllus and astragalus, which were in good condition. Out of the ten plant species by the number of individuals, S. sclerantha, black saxaul and wild rue. Due to these plants, the desert pastures productivity increases (table-5).

Table – 5. The number of plants that appeared by natural self-growth on experimental options (pcs/ha)

№	Plant name	Experience options			
		1	2	3	Control
1	Black saxaul	7333	17667	19333	15667
2	Syrian bean-caper	4667	6000	3667	1667
3	Wild rue	667	-	-	-
4	Convolvulus divaricatus	1333	1000	-	1000
5	Гороииновия неправильная	1000	-	-	-
6	Heliotropium arguzioides	69333	-	-	-
7	Alhagi	3667	1000	2000	3667
8	Astragalus	1000	7000	-	-
9	Halothamnus subaphyllus	-	5333	3333	-
10	S. sclerantha	-	6667	12333	36000
	Total	39000	44667	40666	58001

Their nutritional value is high. For example, 1 kg of air-dry mass of black saxaul in summer is 0.52 kg of feed units, halothamnus subaphyllus is 0,44 kg, alhagi is 0,55 kg, salsola is 0,54 kg feed units.

CONCLUSIONS

1. Leaving stumps 10-15 cm high is good for the black saxaul regeneration.
2. Leaving 3-4 stumps on each stump promotes breaking them under the influence of strong winds.
3. Options of the experiment, on which 9-10 growth were left on each stump, their resistance to the wind action turned out to be higher.
4. The height of three-year growth was 223-258 cm in the control option, where the removal of the growth part was not carried out was significantly lower and amounted to 210 cm.

   In the third option of the experiment, on which stumps 9 more developed growth were left for the third year of the experiment, the fodder weight of saxaul and other plants was 895.5 kg/ha.

Growth regeneration is the simplest and most reliable way to regenerate the pasture of the protective forest plantations of black saxaul.

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