JOURNAL OF COMPLEMENTARY MEDICINE RESEARCH, 2020
VOL 11, NO. 5

RESEARCH ARTICLE

Open Access

Ecological and forestry features of Maksimovich's poplar on the territory of the Vladivostok forestry (Ussuriysk, Primorsky Krai, Russia)

Rozlomy N.G., Gukov G.V.
FSEO HPE Primorskaya state agricultural academy

ABSTRACT
Primorsky Krai occupies more than 160 thousand km² and is located in the southeastern part of the Far East. Its flora includes 284 species of trees, shrubs and woody vines, many of which are relict and endemic. A total of 2 529 plant species grow in the Primorsky Territory, of which 88 species of trees, 175 shrubs and shrubs, 21 are lianas, 2 173 are grasses, 64 are ferns and 8 species of horsetails (Vascular plants of the Soviet Far East, vol.1-8). Many species of trees growing mainly in the Primorsky Territory have different properties (Belov,2020).

ARTICLE HISTORY

Received October 16, 2020
Accepted November 02, 2020
Published December 20, 2020

KEYWORDS

Ecological, forestry, Russia.

Poplar Maximovich (Populus maximowiczii A. Henry.)
the tallest and fastest growing deciduous tree in the south of the Far East. Reaches up to 40 m in height and up to 2,5 m in diameter. Lives long - 100-250 years. Photophilous, frost-hardy, undemanding to the richness of the soil. Its large leaves are decorative, beautiful, which bloom early and do not change their color for a long time. Poplar Maksimovich is common in the Primorsky Territory, in the south of the Khabarovsk Territory, on Sakhalin and the Kuril Islands, in the north of the DPRK and in the regions of the People's Republic of China adjacent to Primorye.
Poplar monocultures Maksimovich were created in the Ussuriysk urban district in the 1970s in order to solve the problem of reducing the growing time of low-value wood (for pulp and paper production) and increasing the productivity of plantations, their total area is 19 hectares (Table.3). Belongs to the department Angiosperms (Magnoliophyta, or Angiospermae), class Dicotyledons (Magnoliopsida), subclass Dilleniidae, willow family (Salicaceae). Under natural conditions, it is widely distributed in the strip of mixed coniferous-deciduous forests of the Far East in the floodplains of rivers, where it grows together with willows. The poplar genus contains 30 species, 18 of them live in Russia (Gridneva, 2014; Usenko, 2010).

Fig.1: Poplar Maksimovich in the arms of Professor B.S.

Petropavlovsky (right) and American botanist at the Educational and Experimental Forestry Enterprise of the PSAA

According to N.V. Usenko (2009) and G.A. Tregubov (1960) poplar Maksimovich prevails in the Far East. It reaches a height of 40, a diameter of 3 m and is one of the largest woody plants. Poplar Maksimovich is a light-loving breed. It is picky about soil fertility and moisture content, prefers moist soils. It grows very quickly. Decorative. Recommended for landscaping (Zhuravkov, 1968). Poplar Maksimovich is weakly resistant to sulfur compounds, to damage by chlorine, to the influence of nitrogen oxides. Has a high degree of tolerance to the action of ammonia.

When laying 5 test plots and characterizing the plantings, the generally accepted silvicultural, geobotanical and biogeocenological methods were used (Isachenko, 1980).

When studying natural and economic conditions, literary sources and observations were used during the practice in the field. Characteristics of the geological structure, geomorphology of the area, hydrographic network, soil and vegetation, were taken from agroclimatic reference books.

Table 1: Taxation characteristics of test plots in artificially created plantations of poplar Maksimovich

№ s/n	Composition	Bonitet	Age, years	Dsr, cm	Nsr, m	Completeness	Stock, m^3 / ha
1	2	3	4	5	6	7	8
1	10 Tm	I	50	29,4	19,3	0,5	130
2	10 Tm	I	53	28,0	20,0	0,4	104
3	10 Tm	I	50	27,2	19,2	0,5	130
4	10 Tm	II	45	24,3	14,3	0,5	107,5
5	10 Tm	I	50	24,8	19,5	0,7	182

Trial area 1

Size 0.7 hectares. Quarter number 55. The flat part of the floodplain of the river. Split. The soil is brown, mountain-forest, powerful, loamy. Many areas with excessive moisture. The planting age is 50 years. Tightness –0,5.

Planting material was 5-year-old seedlings grown in a local nursery. Soil preparation - strip plowing and harrowing. Manual planting, under Kolesov's sword, placement 6,0x0.5 m, 2,5 thousand pcs/ha. There are 235 trees on the site, 28 of them were damaged, i.e. safety – 9,4%. The crop condition is good. Undergrowth is absent due to constant ground fires. The undergrowth is weak, represented by the Amur lilac, the location is solitary. Due to the high moisture content of the site, the grass cover is mainly represented by sedge.

The soil has the following structure:

A0 – 0-8 cm - forest litter consists of ash foliage, litter of shrubs, stems of herbaceous plants;

A1 – 8-37 cm - dark gray, fresh, sandy loam, loose, nutty, densely penetrated by the roots of trees and shrubs;

B – 37-47 cm - dark brown, fresh, loose, sandy loam, fine-grained;

C – 47 cm and below - alluvial deposits.

Trial area 2

Size 0,4 hectares. Quarter №. 56. The watershed between the Komarovka and Razdolnaya rivers. The soil is alluvial, slightly soddenny, stratified with a light texture. The density of the plantation is 0,4. Age 53.

Planting material - 3-year-old seedlings grown in a local nursery. Soil preparation - strip plowing and harrowing. Manual planting, under Kolesov's sword, placement 6,0x0,5 m, 2,5 thousand pcs/ha. The current state of forest plantations is satisfactory. There are 210 trees on the trial plot, of which 13 were damaged. Preservation – 8,4%. The undergrowth is large (2,5-3,5 m), reliable (1,7 thousand pcs/ha), distributed evenly, composition: 4I2Ya4Tm, which is obviously associated with a strong soil moisture. The undergrowth is represented by cod, wild rose, maple, euonymus, etc., with an average height of 1,5-2 m. The grass cover is uniform, mainly represented by hygromesophiles and mesophylls.

The soil has the following structure:

A0 – 0-5 cm - forest litter formed by poplar leaves, slightly sod;

A1 - 5-24 cm - dark gray, loamy, fresh, loose;

B - 24-95 cm - brown, loamy, fresh, there are small pebbles;

C - 95 cm and more - alluvial deposits.

Trial area 3

Size 0,6 ha. Quarter № 50. The site is located in the northwest of Soldatskoye Lake. The soil is soddy-alluvial, with a well-defined humus horizon. The drainage is satisfactory. The microrelief of the site is well expressed. Age 50. Tightness – 0,5.

The planting material was 3-year-old seedlings grown in a local nursery. Manual planting, placement 9,0x0,5 m, 2 thousand pcs/ha. The state of the stand is satisfactory. On the trial plot, the number of preserved trees is 318, of which 18 are

damaged, the state of preservation is 15,9 %. The stand is represented by individuals with a step of thickness from 24 to 32 cm. Regeneration is generally satisfactory. Viable undergrowth (900 pcs/ha), dry (100 pcs/ha), composition: 3Tm7I. Posted in groups. The undergrowth consists of crackling, wild rose, etc., with an average height of 1,5 m, and is evenly distributed over the entire trial plot. The ground cover is well developed, the species composition is numerous, represented by hygrophytes and grasses, evenly covers the surface.
The soil has the following structure:
A0 – 0-1 cm - forest litter is poorly expressed, consists of poplar, willow and elm foliage, shrub litter, stems of herbaceous plants;
A1 - 1-10 cm - dark gray, loamy, slightly compacted, densely penetrated with roots;
A2 - 10-17 cm - whitish-gray, loamy, dry, thin-layered;
At -17-87 cm - light brown, contains ocher inclusions, white powdery powder, fresh, dense, loamy, with traces of gleying, roots in the lower part of the horizon are absent.

Trial area 4
Size 0,5 hectares. Quarter № 51. The site is located on the territory adjacent to the Soldatskoye Lake. The soil is brown mountain forest, drainage is good. Age 45.
Planting material - 3-year-old seedlings grown in a local nursery. Soil preparation - plowing to a depth of 25 cm and harrowing. Planting method - strips, manual planting, under Kolesov's sword, placement 9,0x0,5 m, 2 thousand pcs/ha. Agrotechnical care was not provided. Preservation - 25.5%. Renewal successful. The undergrowth is healthy, reliable (1.4 thousand pieces / ha), medium (0.5-1.5 m) and large (up to 3.5 m) in height, composition: 3Y4Bx3I (Table 6.10). Two-tiered undergrowth (first tier - 2.3 m, second - 1.5 m), reliable, located in large groups, represented by rhododendron, cod, dog rose, etc. The ground cover is poorly developed, the species composition is small, represented mainly by hygrophytes, evenly covers surface.
The soil has the following structure:
A0 – 0-2 cm - forest litter, the sod layer consists of poplar foliage, shrub litter, stems of herbaceous plants;
A1 - 2-26 cm - dark gray, moist, sandy loam, fine-cloddy-silty, densely penetrated by the roots of trees and shrubs;
A2 - 26-64 cm - whitish, wet, light loamy, loose;
B - 64-95 cm - dark brown, moist, clayey, structureless;
C - 95 cm and deeper - alluvial deposits.

Trial area 5
Size 0,5 hectares. Age 50. Closeness – 0,7. Quarter № 51. Soldatskoye Lake District. The soil is brown, meadow. Drainage is good.
The planting was established in 1959. The planting material is 3-year-old seedlings grown in a local nursery. Soil preparation - plowing to a depth of 20 cm and harrowing. Planting method - in strips, manual planting, under a shovel, placement 9,0x0,5 m, 2 thousand pcs/ha. The state of the crops is satisfactory. On the trial plot, 218 trees were preserved, 4 were damaged. Preservation – 10,9%. Renewal is good. Large undergrowth (2-3,5 m), viable (1,1 thousand pcs/ha), composition: 4Y6I. The undergrowth is reliable, the condition is good, the average height is 1,5-2 m, the distribution is even, represented by the Asiatic bird cherry, mock-orange, euonymus, rose hips, etc. The ground cover is well developed, the species composition is numerous, it is mainly represented by mesophytes, evenly covers the surface.
The soil has the following structure:
A0 – 0-2 cm - forest litter, the sod layer consists of poplar foliage, shrub litter, stems of herbaceous plants;
A1 - 2-30 cm - dark gray, wet, sandy loam, fine lumpy-silty, densely penetrated with roots of trees and shrubs;
A2 - 30-55 cm - whitish, wet, light loamy, dense;
B -55-95 cm - dark brown, moist, clayey, structureless;
C - 95cm and deeper - alluvial deposits.
Each species is distinguished by its inherent biological characteristics and exhibits high growth energy only in certain soil and climatic conditions (Il'kun, 1971). Taking into account the biological and ecological characteristics of Maksimovich's poplar, foresters have identified zones of their rational use in the forest cultures of the Far East. In the zone of coniferous-deciduous forests, it is advisable to introduce rot-resistant forms of Maksimovich's poplar into crops (Rozlomiy, 2009). All types of poplar are moisture-loving and their culture must be created in the floodplains of rivers and river valleys, along the bottom of ravines and thalweg, on the lower most humid parts of the slopes, along the banks of rivers, reservoirs, irrigated canals and in other areas with groundwater occurrence in mid-summer at a depth 0,60-1,2 m, since it is the Far East that is prone to constant typhoons and floods.

REFERENCES

1. Belov A.N., Repsh N.I., Kol'tsova L.A., Khil'kova M.K. Degradatsiya poymennykh rastitel'nykh ekosistem i yeyo prichiny // Zhivotnyy i rastitel'nyy mir Dal'nego Vostoka. [Elektronnyy resurs]: Dal'nevostochnyy federal'nyy universitet, Shkola pedagogiki; – Elektron. dan.

– Vladivostok: Dal'nevostochnyy federal'nyy universitet, 2020. – Vyp. 33. – S. 19-21.
2. Zhuravkov, A.F. Rekreatsionnoye lesopol'zovaniye v dubravakh zelenoy zony Vladivostoka / A.F. Zhuravkov, A.P. Dobrynin // Lesnoye khozyaystvo. - 1986. - № 12. - S. 53–55.
3. Il'kun, G. M. Gazoustoychivost' rasteniy / G.M. Il'kun. - Kiyev: Naukova dumka, 1971. - 146 s.
4. Isachenko, A. G. Metody prikladnykh landshaftnykh issledovaniy/ A.G. Isachenko.- L.: Nauka, 1980. - 222 s.
5. Rozlomiy, N.G. Kratkaya kharakteristika zelonoy zony g. Ussuriyska / N.G. Rozlomiy, V.V. Ostroshenko // Vestnik KrasGAU.- 2009.- № 9. - S. 83-87.
6. Reliktovyye drevesnyye rasteniya Primorskogo kraya i ikh dekorativnyye svoystva / N.V. Gridneva, G.V. Gukov, N.G. Rozlomiy, O.YU. Reyf // Vestnik KrasGAU. – 2014.- №12. - S.62-66.
7. Usenko, N.V. Derev'ya, kustarniki i liany Dal'nego Vostoka / N.V. Usenko; nauch. red. S.D. Shlotgauer. - 3-ye izd., pererab. i dop. - Khabarovsk: Priamurskiye vedomosti, 2010.- 272 s.