

THE EFFECT OF FIRE IMPACT ON SEED VIABILITY OF PINUS SILVESTRIS

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One of the environmental factors causing the most powerful transformation of forest ecosystems is fires. Depending on the strength of the fire, the dynamics and nature of the subsequent changes will have different directions. Strong fire impact causes death of plant communities and burnout of the organic part of the soil cover. Weak fires, on the other hand, can act as a stabilizing factor for the preservation of coenopopulations. Surface burning of ground vegetation and litter encourages natural regeneration of forest tree species, without destroying the forest and increasing biostation properties of the ecosystem [1].

But to initiate reforestation process on burned areas must provide sufficient seeding. However, when after a fire at the trees growing on fire approach of seed years is tightened, natural renewal of tree breeds extends for a long time. Under the circumstances, the seeds from the previous harvest, which are in the soil and for some reason have not sprouted, can provide real assistance. Most often, the seeds do not come out of a state of rest due to dry weather at the initial stage of the growing season [2]. High temperatures and lack of precipitation block the activation of metabolic processes in the seeds, and they go into a state of forced rest. The soil stock of seeds, so-called "Bank of seeds" is formed. Naturally, some of these seeds under favorable conditions can germinate and form sprouts.

To determine soil inventory and preservation of seeds of *Pinus sylvestris* after fire impact studies have been conducted in Mansky-Kansky forest district the Eastern Sayan province. The object of study was a common group of forest types in the region – pine forests of mixed grass and cowberry. On the selected polygon representing the uniform in forest taxation and silvicultural characteristics of the area, laid three plots bordering with each other. The sites described, measured the thickness of the litter and along the periphery conducted mineralized bands that serve as protective barriers in the application of controlled fire.

In the second decade of May, when the process of natural subsidence of seeds in pine is completed and the snow cover is coming down, the soil stock of seeds was determined. It should be noted that the harvest of pine seeds of the previous year was estimated as good. Seeds were extracted from forest litter. Preliminary studies of the surface (up to 3 cm) mineral layer of the soil showed that the seeds moved here (their negligible amount) completely lose their viability.

Each plot was laid 10 accounting sites with size 0,5x1 m. The forest floor at sites cut by special blade and then produced a sample of seeds. A seed fund made up on the

first sector – 63132 units/ha, the second 55967 units/ha and the third – 59438 units/ha. Quality of external features of the seeds germinated in laboratory conditions in Petri dishes at a temperature of 22-24 degrees. Laboratory seed germination in all areas ranged from 75-81%.

In June, during the period of mass germination of seeds, the plots were recorded shoots. Their number on the plots, taking into account the large drop – off of plants in the first year of life, was low-about 3000 units/ha. Such a small number is explained by unfavorable meteorological conditions for seed germination during the growing season. The prevailing anticyclonic type of weather in late spring-early summer did not allow to form an environment conducive to the activation of physiological processes in the seed.

Burning out was carried out at the end of summer, at the same time used fire of different force, selecting the appropriate weather conditions. At the first site, as a result of fire exposure, the burning of the ground cover and the surface burning of the litter occurred. In the second section, the fire destroyed half the litter, and the third fire was steady, and bare mineral soil layer.

After controlled burning on the areas covered by fire again found stocks of seeds and determined their germination. On the first site 51694 units/ha were found (laboratory germination – 54%), on the second – 17032 units/ha (germination – 30%) and on the third seed was not found.

Summarizing the above, it can be argued that in the case of comfortable reforestation, in the spring of next year on the first site there will be a sufficient number of seeds for the settlement of this territory with pine seedlings, even without the harvest of the current year. A different situation exists in the second section where the average power of the fire sharply reduced the number of viable in appearance of seeds and decreased their laboratory germination. There will undoubtedly be a lack of seed. Strong fire on the third plot destroys the entire soil stock of seeds.

References

1. Matveeva T.A., Matveev A.M. Fires in mountain forests of middle and southern taiga. - Krasnoyarsk: Dharma, 2008. - 213 p.
2. Yakushkina N.I. Plant physiology. - Moscow: Education, 1993. - 335 p.