MICROBIOLOGICAL ACTIVITY OF GREY FOREST SOIL IN MAIZE CROPS

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Abstract. *The effect of lanthanum on the number of physiological groups of microorganisms in gray forest soil in maize crops was studied. Safe doses of introducing lanthanum into the soil have been established, increasing the abundance and biological activity of soil microflora. This increases the yield of green mass of corn, and the supply of nitrogen to plants is due to both fertilizer nitrogen and soil itself.*

Keywords: *soil, lanthanum, microorganisms, fractional composition, nitrogen corn, crop.*

INTRODUCTION

Soils of the forest-steppe zone of the Republic of Buryatia are represented by gray forest podzolized and podzolized, long seasonally frozen and dark gray forest soils [1]. The microflora of gray forest soils has not been studied sufficiently. It is known that gray forest soils, which are more favorable than podzolic soils, are characterized by a higher biological activity. On the basis of medium loamy with a high content of humus, provided with nutrients, optimal conditions are created for the development of microorganisms in it [2].

In a number of studies it was noted that lanthanum increased the fixation of atmospheric nitrogen by nodule bacteria in symbiosis with leguminous plants, biological activity, nitrification and nitrate accumulation in soils, yield and quality of plants [3].

The aim of the study was to study the influence of lanthanum when introducing it into the soil on the quantitative composition of soil microflora, the nitrogen fund and the productivity of maize.

MATERIAL AND METHODS

Researches were spent on grey wood to ground, with the maintenance humus 3,36, pH 6,8, with average security nitrogen, mobile phosphorus and exchange kalium**.** Experimental culture - corn grade Ross-191 M. In soil in corn sowings, ammonium nitrate, double granulated superphosphate, potassium chloride per 1 kg of soil N150P150K150 were introduced as a background that served as a control. Lanthanum in the form of sulfate was introduced into the soil in doses of 3 and 6 mg / kg soil. All fertilizers, except superphosphate, were introduced into the soil in solution. The moisture content of the soil was maintained at 60% of the total moisture capacity. Agrochemical and microbiological analyzes were performed according to generally accepted procedures [5,6].

RESULTS AND DISCUSSIONS

In ground without fertilizers investigated physiological groups of microorganisms except for Nitrifying raised in number all, most actively developed ammonifying microorganisms and Actinomycetes**.**

At entering mineral fertilizers the aggregate number of microorganisms increased due

to Nitrifying bacteria which on number in 10 times exceeded a variant without fertilizers. Mineral fertilizers in initial phases of development of corn reduced growth of other groups of microorganisms, especially mushrooms and microorganisms destroying cellulose**.** Hence, mineral fertilizers by virtue of the high concentration in the soil environment in initial phases of development of plants oppressed growth of separate groups of microorganisms.

At entering the rare grounds an element Lanthanum in ground in different dozes, during all vegetation number of all groups of microorganisms, except for Actinomycetes where in a variant about 6 mg/kg Lanthanum their number decreased actively increased, but in the same variant there was an increase in number ammonifying in 2,4, mushrooms in 2,7, microorganisms destroying cellulose in 2,0 times, and quantity Nitrifying microorganisms remains at a level of the control. Number microorganisms destroying cellulose microorganisms also increased under influence Lanthanum during all vegetation that strengthened microorganisms destroying cellulose activity of ground.

Under influence of the mineral fertilizers brought in ground, actively developing corn with intensive absorption of nutritious elements, changes in fractional structure of nitrogen of ground under influence Lanthanum were essentially leveled. In the maintenance of the general nitrogen decrease in its quantity by the period of cleaning of plants in all variants was marked. It testified to an intensive mineralization of organic nitrogen at high number of microorganisms. Thus the opportunity of loss of nitrogen as a result denitrificans increased also. In initial phases of development of corn in a phase of 4 present leaves in a variant about 6 mg/kg Lanthanum difficulty hydrolyzed the fraction of nitrogen authentically increased, and the quantity of mineral nitrogen noticeably decreased, also the share of not hydrolyzed fraction slightly decreased. At increase of a crop of plants also carrying out of nitrogen which exceeded quantity brought with nitric fertilizer in 4-6 times essentially increased. Alongside with a mineralization of nitrogen also process of mobilization of soil resources intensively proceeded.

CONCLUSIONS

1. In the gray forest soil against the background of mineral fertilizers, under the influence of different doses of lanthanum, the number of all groups of microorganisms actively increased.

2. Lanthanum increased the yield of the aboveground mass of corn: at doses of 3 and 6 mg/kg, by 8 and 12%, respectively.

3. The supply of nitrogen to plants was carried out both due to nitrogen fertilizers, and the soil itself.

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