

Problems of using reclaimed land in the Irkutsk region

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Abstract. The research conducted within the framework of the grant of the Ministry of Agriculture of the Russian Federation on the topic "Research of ownerless reclaimed lands in the Irkutsk region" in 2022 revealed long unused ownerless reclaimed agricultural lands related to pastures and hayfields. On the lands there are long time non-functioning hydro-reclamation drainage systems with destroyed open regulating and conducting network of canals. The surveyed agricultural lands are classified as overwatered. The lands mainly have favorable soil characteristics. Problems of using reclaimed lands have been identified. Recommendations on their further use for involvement into agricultural turnover are given.

1 Introduction

To ensure food security at the present stage, it is necessary to ensure the effective use of agricultural land [1-6]. One of the ways to solve this problem is the involvement of unused reclaimed land into agricultural turnover [7-10]. Therefore, the study of the use of reclaimed land that fell out of agricultural turnover by the example of the Ekhirit-Bulagat and Irkutsk districts of the Irkutsk region is relevant.

The aim of the work is to study the problems of the use of ownerless reclaimed land that fell out of agricultural turnover by the example of the Ekhirit-Bulagat and Irkutsk districts of the Irkutsk region.

Research objectives:

- to identify the problems of use of ownerless reclaimed lands that have fallen out of agricultural turnover;
- give recommendations on their use.

2 Materials and Method

2.1 Materials

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The research was carried out in 2022 in the course of implementation of the grant of the Ministry of Agriculture of the Russian Federation on the subject "Research of ownerless reclaimed lands in the Irkutsk region". The object of the study is ownerless reclaimed agricultural land located on the territory of the Ekhirit-Bulagat and Irkutsk districts of the Irkutsk region, related to pastures and hayfields. On the territory of the Ekhirit-Bulagatsky District, pastures are located near the settlements of Kharat and Korsuk, on an area of 175.35 and 360.95 ha, respectively. In Irkutsk district pastures are located near Bykovo and Baruy settlements with the area of 555.53 ha and 36.4 ha respectively. hayfields are located near Bykovo and Karmagai settlements with the area of 108.07 ha.

2.2 Methodology

Local land monitoring methods were used for the study.

3 Results and discussion

In the course of local monitoring studies in the Ekhirit-Bulagat and Irkutsk districts, there were identified abandoned agricultural land that had not been used for a long time, which is related to pastures and hayfields. On the surveyed lands there were found long-term non-functioning irrigation and drainage systems with open regulating and conductive network of canals. In Ekhirit-Bulagatsky district for the drainage system located near the settlements of Kharat and Korsuk the Murin river was the water recipient. In the Irkutsk district, the dewatering systems located near the villages of Bykovo and Karmagai were water recipients. Bykovo and Karmagai, the Baley River was the water recipient. The drainage system near the village of Baruy was served by the Baley River. The Butulai River was the water recipient.

The total area of the investigated lands in the Ekhirit-Bulagat and Irkutsk districts is 536.3 and 700.01 ha respectively. The surveyed lands are referred to the overmoistened lands due to high ground water level, recurrent spring and summer floods, stagnation of excessive surface water. In general, the surveyed agricultural lands have favorable soil characteristics. Soil type is meadow chernozem with loam of light mechanical composition with neutral or close to neutral soil acidity. The high content of organic matter from 49 to 85.4% is observed on the plots (table 1-2).

Table 1. Characteristics of agricultural land in the Ekhirit-Bulagatsky District.

Dewatering system	Type of site	Total area, ha	Soil types and their mechanical composition			Botanical description
			soil type	mechanical composition	pH	
Drainage system, adjacent to the village of Kharat	pasture	175,35	meadow chernozem	light loam	7	field horsetail, creeping couch, common dandelion, mouse pea, common plantain, creeping clover, creeping buttercup, meadow geranium, bloody palm tree birch warthog, goat willow.
Drainage system adjacent to Korsuk village	pasture	360,95				

Table 2. Characteristics of agricultural land in the Irkutsk district.

Dewatering system	Type of site	Total area, ha	Soil types and their mechanical composition			Botanical description
			soil type	mechanical composition	pH	
Drainage system, adjacent to the village of Bykovo	pasture	555,53	meadow chernozem	light loam	6-7	birch, willow, goat willow, creeping couch, common dandelion, creeping clover, buttercup, field horsetail, common yarrow.
Drainage system section adjacent to Bykovo and Karmagai villages	hayride	108,07				
Drainage system, adjacent to the village of Barui	pasture	36,41				

As a result of the fact that drainage systems have not functioned for a long time, the network of conducting canals was destroyed and negative processes developed over the entire area of lands, such as waterlogging, bogging and overgrowth with tree and shrub vegetation.

4 Discussion

As a result of the local monitoring studies conducted in the districts, the following problems of ownerless reclaimed land use were identified:

- agricultural lands are not registered in the cadastre, are ownerless, fallen out of agricultural turnover;
- as a result of long non-use the open regulating and conducting network of irrigation and drainage canals has been destroyed;
- The negative processes of waterlogging, bogging and overgrowing with trees and shrubs have developed on the whole area of lands.

At the present time the Ministries of Agriculture of the Russian Federation and the Irkutsk region have adopted a number of programs to provide financial support for the involvement of unused agricultural land in the turnover: "Development of Reclamation of Agricultural Land in Russia" and "Development of Reclamation of Agricultural Land in Irkutsk Region" for 2014-2020, "Development of the Reclamation Complex of Russia" for 2019-2025. The adopted programs contributed to the beginning of reclamation construction in the region and the restoration of soil fertility on the area of 5.4 thousand hectares [11].

According to the results of the research in the surveyed territory to solve the problems of reclaimed land and involvement of agricultural land in agricultural turnover at the expense of federal and regional programs of state support for the development of land reclamation in Russia it is recommended to carry out a set of measures:

- putting ownerless agricultural lands on the cadastral register;
- rehabilitation of drainage systems through their reconstruction;
- implementation of cultural and technical reclamation measures with radical improvement of lands;

- for the most expedient use of lands, it is proposed to transform hayfields into pastures.
- Long-term pastures (6-9 years);

It is recommended to rehabilitate drainage system by means of reconstruction, open regulating and conducting network of canals.

It is proposed to carry out radical improvement on degraded pastures and hayfields, overgrown with bushes, bogged and swampy, which is confirmed by earlier studies. [12-13]. For the most expedient use of lands, it is proposed to transform hayfield into pasture.

On the surveyed territories it is necessary to carry out cultural and technical activities on clearing the surface from wood and shrub vegetation, buried wood, milling mounds, leveling the surface on the drained fields. After that, in the second ten-day period of June, plow up land to a depth of 20 cm. In the third decade of June to carry out milling, in the second decade of July to break up the sod with discoms. In the third decade of July to carry out a final leveling of the surface. In the first ten-days of August roll to decompose the layer of turf.

Then in spring in the first decade of May, it is recommended to carry out early spring harrowing, in the second decade of May - pre-sowing cultivation and sowing under the cover of barley, in the third decade of June - sowing. Until July 20, sowing leguminous-grasses in the ratio of 70% grass and 30% leguminous grass with the addition of mineral fertilizer N30P30K30, then rolling the crops. Subsequently, it is necessary to carry out maintenance of pasture grass stand. Annual fertilizing with nitrogen fertilizers N15, as well as rejuvenation of sod by discing, depending on the state of the pasture gra.

5 Conclusion

The conducted studies of reclaimed land use in the Irkutsk region on the example of the Ekhirit-Bulagat and Irkutsk districts showed that it is possible to ensure food security and sustainable development of rural areas through federal and regional programs of state support for the development of reclamation in Russia by involving unused agricultural land in agricultural turnover through the restoration and reconstruction of drainage systems, cultural and technical reclamation measures

Availability of sufficient areas of improved pastures in the surveyed area can fully meet the need of cattle in nutrients during the entire grazing period.

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