

EFFECTIVENESS OF APPLICATION OF ZONE AGROTECHNOLOGY IN CEREAL CROPS

Kozulina N.S.

Krasnoyarsk state agrarian university, Krasnoyarsk, Russia

The article examines the effectiveness of zonal agrotechnology in the cultivation of grain crops, taking into account the use of agroclimatic resources of the Krasnoyarsk forest-steppe.

Key words: *agrocenosis, cereal crops, content of impurities, herbicides, soil cultivation methods, agrotechnologies, agroclimatic resources.*

ЭФФЕКТИВНОСТЬ ПРИМЕНЕНИЯ ЗОНАЛЬНОЙ АГРОТЕХНОЛОГИИ ПРИ ВОЗДЕЛЫВАНИИ ЗЕРНОВЫХ КУЛЬТУР

Козулина Н.С.

Красноярский государственный аграрный университет, Красноярск, Россия

Аннотация: *В статье рассматривается эффективность применения зональной агротехнологии при выращивании зерновых культур с учетом использования агроклиматических ресурсов территории Красноярской лесостепи.*

Ключевые слова: *агроценоз, зерновые культуры, засоренность, гербициды, способы обработки почвы, агротехнологии, агроклиматические ресурсы.*

Modern agrotechnologies are used as components of technological operations to manage the production process of agricultural crops in agrocenoses in order to achieve the planned yield and product quality while ensuring environmental safety and certain economic efficiency [1]. Depending on the application of chemicalization, soil treatment, crop rotation, a phytosanitary situation is formed in crops of agricultural crops.

At the present time, 40-50% of the cultivation area in the Krasnoyarsk Territory is littered with weedy vegetation in medium to large extent. In this case, especially harmful perennial weeds prevail in grain crops, as well as certain plant species possessing increased resistance to many herbicides. [1]

Weed plants cause significant damage to the crop and its quality, which is associated with their increased resistance to growing conditions. In addition, they are more profitable to compete with cultural plants for light, nutrients and moisture. As a result, they suppress the development of cultivated plants and weaken their resistance to adverse environmental factors [4]. Numerous studies have established that weeds use 25-30% of water from the soil, hamper timely and quality performance of agrotechnical measures, reduce the productivity of agricultural machines, adversely

affect yields, product quality, increase the cost of production. Combined with this, competition arising from the nutrient regime of soils in contaminated areas is perhaps the most important reason for the decline in yields of agricultural crops. It has been established that the fertilizer use factor in such areas is reduced by 30-35% compared to pure weeds [5,7].

The harmfulness of weeds is also enhanced by the fact that a significant part of pathogens and pests in certain periods and phases of development use weeds as an intermediate host, as a result of which they become a hotbed of harmful epiphytoty [2]. The harmfulness of weeds depends to a large extent on the soil and climatic conditions of their growing zone, their abundance and species composition.

The purpose of the research is to study the effectiveness of zonal agro-technology in the cultivation of grain crops, taking into account the use of agro-climatic resources in the Krasnoyarsk forest-steppe. Against the backdrop of zonal technology of growing spring wheat, to develop a range and application of herbicides in specific soil and climatic conditions. To consider the effectiveness of the use of herbicides in regulating the weed component of spring wheat agrophytocenosis.

Conditions, materials and methods of research: field experiments were carried out according to the generally accepted method in the «Menderlinskoe» of Krasnoyarsk SAO, Suhobuzimsky district, located in the forest-steppe zone of the Krasnoyarsk Territory.

The soil cover of the experimental site is leached with chernozem, the total area of the site is 6 hectares, the record plot of field is m^2 , the plots are not completely allocated; repetition – 4-fold. The sowing period is the 2nd decade of May; the seeding rate is 4.5 million vesicles per hectare.

The study was carried out on a highly infectious background after a predecessor after wheat. According to the obtained soil analysis data of the experimental site (flotation method), the soil population caused by root rot agents was much higher than the EPO (40 conidia in 1 g of air-dry soil), in layer 0-10 – from 1.5 (spring) to 3.3 times autumn). Simultaneously, a stock of weed seeds was determined in the arable layer of the soil under the conditions of production experience.

Accounting for the initial weediness of wheat crops was carried out before the treatment with herbicides. Processing of crops with herbicides was carried out during the phase of tillering of wheat (2nd decade of June).

In the experiments, early-ripening varieties of spring wheat of Siberian selection, popular in the Krasnoyarsk Territory, were used: Novosibirskaya 15, Altai 70 and Vavenkov's Memory [3]. Field experiments were laid by deep plowing, minimal tillage, zero seeding and zero seeding + paraploughing. Observations and records were carried out during the vegetation period using conventional methods and existing GOSTs.

Experiments of studying the effectiveness of herbicides were carried out in different years. During the research, various tank mixtures of herbicides were tested.

Results of the study and their discussion.

Based on the results of studies on tank mixtures of herbicides (Puma super100, e.c., 0.75 l / ha + Magnum, vd, 8g / ha, Puma Super100, e.c., 0.75 l / ha + Grench D,

r., 4g / ha; Puma Super 100 e.c., 0.75 l / ha + Grench SP, r., 8g / ha) against the background of high weed infestation was the tank mixture: Puma super 100 e.c. 0,75 l / ha + Grench SP, r., 8 g / ha, the use of which provided an increase in yields compared to the control of 10.9 c / ha, with a profitability level of 92.8%.

Studies have shown that in the conditions of the agricultural forest-steppe zone of Krasnoyarsk Territory, a high and average degree of contamination is observed everywhere; it was found that the number of weeds in various degrees exceeds the thresholds of damage.

In our experiments, the yield of spring wheat decreased by 5.8 centners per hectare against the background of debris in dicotyledonous perennial species (sow), with a population density of 24.0 pcs / m², with an increase in debris up to 45.5 pcs / m² – yield losses reached 6.2 c / ha.

The determination of the stock of weed seeds in the arable layer of the soil under the conditions of the production experience showed that the largest number of weeds is concentrated in the upper 20 cm layer.

Sowing crops, including spring wheat, react most strongly to the adverse effects of weeds in the early stages of development. A scientifically grounded system of control of weeds is a complex of organizational, preventive and exterminating measures.

Accounting for the initial weediness of wheat crops, conducted before the treatment with herbicides, showed its high degree in all years of research [6].

The number of weeds on average in the experimental plot ranged from 126 to 480 pieces / m², the type of clogging mixed (oats, millet chicken, stubble, hemp, buckwheat wattle, sow, stew, pickle, bedstraw chain, etc.) This dominant position in the general background of fouling occupied oats. It should be noted that most of the above mentioned weeds in the years of research in their number exceeded the EPO. The processing of crops with herbicides was carried out by us during the tillering phase (II decade of June) on wheat crops in accordance with the experimental design.

When studying a tank mixture of herbicides – Dielen Super, VP, 0.35 l / ha + Topek, KE, 0.2 l / ha. Its high biological efficiency has been established. On average, according to soil treatment options, it was 90.6%.

In the course of the research, we also used two preparations of the highest efficiency – a tank mixture of herbicides Prima SE, 0.5 l / ha + Axial, CE, 1.0 l / ha.

Prima, an after-emergence herbicide for the protection of crops and corn from a wide range of dicotyledonous weeds, even destroys such labor-destructive species as the pickaxe, the odorless chamomile, the left-over on the left, the yellow osier, etc.

Due to the excellent systemic activity of the active substance: 2,4-D in the form of ethylhexyl ether (300 g / l) and florasulam (6.25 g / l) easily penetrates and spreads rapidly through the weed plant for an hour, blocking growth processes.

Axial post-emergence herbicide of selective action obtained on the basis of pinxadene showed high efficiency in crops of cereals in the fight against grass weeds. To expand the spectrum of action against dicotyledonous weeds, it can be used in a tank mix with a large set of herbicides and insecticides used on grain crops at the same time. The period of protective action is 1,5-2 months.

A scientifically grounded approach to the selection of herbicides and the period of their application made it possible to obtain extremely high efficiency indices of this herbicide tank mixture that reduces the level of weediness by monocotyledonous weeds up to 96.3% and bicarbony annual species of weed components to 72.4%.

The highest contamination in all the years of research was characterized by backgrounds with direct sowing and fissuring on direct sowing. The number of weed plants according to the options for tillage averaged 240 and 243 pieces / m², which corresponds to exceeding the severity threshold by 16.0-16.2 times.

The number of dicotyledonous young species, under the influence of herbicides, declined by an average of 72.3% in processing backgrounds, including 91.7% and 90.5%, respectively, on direct sowing and crevice.

A similar pattern was observed in all studied wheat varieties according to the studied soil treatment backgrounds. At the same time, there was a significant decrease in the contamination of the crop (to a level below the threshold of damage).

Observations of the growth and development of wheat plants after treatment with herbicides showed that both vegetative and generative organs in variants where herbicides provided a significant reduction in the competition of wheat with weed vegetation developed more efficiently than control ones. Thus, the height of wheat plants, on the average in variants with herbicides, exceeded by this indicator plants in the control variant by 6.4-6.6 cm (significant excess). The spike also tended to increase in length relative to the control, on average, by – 0.5-0.7 cm. There were no signs of iatrogenic diseases on plants.

The study of the structure of the harvest before harvesting showed that in the variants treated with the tank mixture, a higher yield level was observed, exceeding the control by 3.2-3.8 c / ha.

The economic efficiency of the tank mixture with different methods of soil treatment was the same (the difference within the error of the experiment).

Conclusions.

1. In studies conducted in the field of the forest-steppe zone of the Krasnoyarsk Territory, high efficiency of herbicide application (a tank mix of Prima + Axial) against weeds was revealed. The decrease in the above-ground mass of weeds in crops of grain crops with annual treatment with herbicides in comparison with the control was 82-98%.

2. The increment of the yield on average in the background of studies and the individual preparations studied varies from 6.3 to 10.8 centners per hectare on the dumping of soil and from 5.1 to 7.9 centner / ha in direct seeding.

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