CROP PRODUCTION

METHODS OF REGULATION 
OF THE PRODUCTION PROCESS
IN BUCKWHEAT CROPS

Abstract. The problem of increasing buckwheat grain production as an extremely valuable cereal crop is now very important. Changeable harvests of this crop are due to the fact that on the one hand, buckwheat reacts rapidly to changing weather conditions, on the other, there is a lack of attention to the technology of its cultivation. Therefore, to obtain high yields of this crop an important role is given to adaptive forms that can implement genetic potential of productivity under unstable conditions, on the other, there is a lack of attention to the technology of its cultivation. Therefore, to obtain high yields of this crop an important role is given to adaptive forms that can implement genetic potential of productivity under unstable conditions.

The solution to this problem can be solved by a comprehensive understanding of the theoretical foundations of the harvest development. The efficiency of the production process depends on many conditions including physiological characteristics of plant species. The higher yield of plants is provided by the more complete variety of necessary conditions. At the same time, for the development of this crop an important role is given to adaptive forms that can implement genetic potential of productivity under unstable conditions.

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time, although, climatic factors are predictable, they are uncontrolled. The problem of managing the production process of agricultural crops in agricultural ecosystems is very important in crop production. Thus, due to the predicted global climate change and strengthening of soil degradation processes, its importance will increase in future. Plant production processes can be controlled by manual, chemical and biological corrections. Using these correction methods of plant productivity creates the necessary conditions for plant growth and development ensuring crop yields. Thus, the biological correction promotes additional yield increase and improvement of the quality of crop production and biological protection substances provide its preservation.

**Keywords:** production process, methods of physical, chemical and biological correction elements of technology, productivity, buckwheat.

**METHODOLOGY REGULATING PROCESSES FORMING HIGHER PRODUCTION POSSESSORS BUCKWHEAT**

**Annotation.** The problem of buckwheat yield, as an important cereal crop, is becoming more important due to changing climatic conditions. Therefore, the yield of buckwheat depends not only on the specific climatic conditions but also on the quality of the crop production process, methods of physical, chemical and biological correction elements of technology, productivity, buckwheat.

**Keywords:** buckwheat.
The problem of increasing buckwheat grain production as an extremely valuable cereal crop is now very important. Changeable harvests of this crop are due to the fact that on the one hand, buckwheat reacts rapidly to changing weather conditions, on the other, there is a lack of attention to the technology of its cultivation. Therefore, to obtain high yields of this crop an important role is given to adaptive forms that can implement genetic potential of productivity under unstable growth conditions, as well as improving the technology of its cultivation. It is important to get high productivity of buckwheat crops provided with high individual productivity of each plant of phytocenosis and optimal growth arrangement over the area.

Optimizing the management and control of buckwheat is also important. As the root system of buckwheat is shallow, the seed placement should be not deep. At the same time, during germination cotyledons are brought to the surface of the soil, the seed placement should be not deep. At the same time, in case of depthless placement in insufficiently moistened soil, there will be a weak development of additional roots. If sowing buckwheat is during afterharvesting and stubble periods, seed placement in the upper overdried soil layer will cause the thinning of sprouts. In this case, it is necessary to do the soil compaction simultaneously with sowing to pack the soil and protect its seed layer from drying out and establish the capillary connection with more humid lower layer of the soil. Therefore, the manual correction is an important part of controlling the production process of plants [5].

The chemical correction is a system of measures aimed at regulating the productivity of crops using chemicals. Application of chemicals is the replenishment of plant mineral nutrients in the soil, foliar feeding with macro and micronutrients, regulating acid and salt regimes of soils, as well as through the use of chemical plant protection products. In this regard, the main efforts of farmers are aimed at getting the required number and proportion of phosphorus, potassium and nitrogen in the soil that is achieved by applying different types of fertilizers. According to ideas of O. Alekseeva and others [6] to obtain stable buckwheat yields, not only botanical and biological characteristics but also conditions under which they are grown are essential. Scientists [7, 8] believe that the main cause of instability of buckwheat yields is the sensitivity of reproductive organs to nutritional deficiencies. The root system of buckwheat is shallow that is why under moderate moistening it can absorb nutrients actively that are near the soil surface. In this regard, it is necessary to provide the optimal balance between nutrients [9]. In addition, the root system of buckwheat at the beginning of its development requires aeration and substantial oxygen supply for the soil.

Historically, the chemical correction was the second evolutionary step of plant protection. Initially, wood ash was used (in swidden farming), then it was manure of farm animals and finally mineral fertilizers. Now for the rational use of mineral fertilizers the so-called precision agriculture is used. Using modern electronic technology this approach allows applying mineral fertilizers in doses considering real content of basic elements of mineral nutrition of plants in the soil. It can be stated that the way of the chemical correction is completely realized in agricultural production. However, as follows from the theory of agricultural chemistry, a significant part of mineral fertilizers introduced into the soil is washed away from the arable layer regardless of the dose. Chemicals used for pest control “work” not completely as there are some pests of agricultural crops (such as larvae of various leaf-miners) which are not destroyed by insecticides and the use of large doses is environmentally dangerous. To solve this problem, there are two main concepts designed to save humanity from environmental and food crisis, namely sustainable development of agriculture and adaptive intensification of production. The first system is based on traditional methods of crop production, the second system – on innovative approaches that require further study of plant genetic resources and widespread use of the biological correction of productivity of agricultural crops [10–14].

The biological correction is one of the most effective areas of management of food and plant protection. Due to the number of methods of the targeted exposure for phytobiology, this approach allows not only further increase the yield of crops with improved quality but also to preserve harvest. In fact, this is a new evolutionary step of crop production that develops adaptive agro-ecosystems. The biological correction is based on the latest scientific advances in biotechnology such as vermiculture, production of microbiological agents, physiologically active substances, biological plant protection products and others [15, 16].

Methodology of the biological correction of productivity
Types of actions aimed at growth and development of plants

<table>
<thead>
<tr>
<th>Manual correction</th>
<th>Chemical correction</th>
<th>Biological correction</th>
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<tr>
<td>Adjustment of mineralogic and granulometric texture of soils</td>
<td>Replenishment of the contents of mineral nutrients for plants in soil Compensation of lack of contents of macro- and microelements in plants Chemical protection of plants Control of acid and salt regimes of soils</td>
<td>Control of species composition and abundance of soil biota Plant infection with microbiologic specimen Biological reclamation Biological plant protection Application of biological insecticidal agents Effect of physiologically active substances on the metabolism of plants: • acceleration of circulation of nutrients in plants; • induction of gene expression; • energy reinforcing; • optimization of respiration and photosynthesis; • optimization of the ratio of anions; • optimization of biosynthesis; • biosynthesis of phytocides; • removal of stress after application of pesticides.</td>
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<td>Tillage operations Mulching of soil Aggregating of soil</td>
<td>Control of moisture, heat and gaseous regimes, as well as soil biological activity</td>
<td>Implementation of reserve functions by plants, as well as increasing crop resistance to diseases and adverse conditions</td>
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Creating favorable conditions for the growth and development of agricultural crops

Obtaining a stably high yield of improved quality by optimizing plant nutrition and reducing losses associated with biological protection against diseases and pests of agricultural crops

Fig. 1. Types of actions on the production process of plants [1]

References