УДК 631.87
DOI: 10.35330/1991-6639-2021-2-100-39-49

THE EFFECT OF SOIL BIOACTIVATION ON THE EFFICIENCY OF MINERAL AND ORGANO-MINERAL FERTILIZER SYSTEMS AND THE PRODUCTIVITY OF WINTER WHEAT

A.M. LESHKENOV, A.H. ZANILOV

Institute of Agriculture –
branch of FSBSE «Federal scientific center
«Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences»
360004, KBR, Nalchik, 224 Kirov str.
E-mail: kbniish2007@yandex.ru

The paper presents comparative data on the effect of biological modification of mineral and organomineral fertilization systems on the productivity of winter wheat under conditions of increasing doses of mineral fertilizers. Bacteria of the genus Pseudomonas fluoreiscence and Azotobacter vinelandii and microscopic fungi of the genus Trichoderma were used as a means of increasing the biological activity of the soil. The high influence of biological modification of mineral and organo-mineral fertilization systems on the economic indicators of winter wheat production was revealed. In some cases, the maximum economic efficiency is manifested in soil bacterization without the introduction of mineral fertilizers in comparison with the options using mineral fertilizers, but without the introduction of microorganisms. In all 12 variants of the experiment, soil bioactivation led to an increase in the yield of winter wheat, which suggests the evolution of the fertilization system and the emergence of an innovative system - bio-organo-mineral.

Keywords: organo-mineral system, fertilizers, soil, biological activity, economic efficiency, gain, calculated rate.

REFERENCES

1. Trepachev E.P. *Agrokhimicheskiye aspekty biologicheskogo azota v sovremennom zemledelii* [Agrochemical aspects of biological nitrogen in modern agriculture]. M., 1999. 530 p.

2. Gladstones J.S. The Narrow-leafed Lupine in Western Australia (L. angustifolius) // Bull. West. Austral Dep. of Agr. 1977. V. 3990. P. 14.

3. Simonovich E.I. *Vliyaniye bioudobreniya «Belogor» na pochvennuyu biotu. Materialy V s"yezda Vserossiyskogo obshchestva pochvovedov im. Dokuchayeva* [Influence of biofertilizer "Belogor" on soil biota. Materials of the V Congress of the All-Russian Society of Soil Scientists n.a. Dokuchaev]. Rostov-on-Don. 2008. Pp. 130.

4. Mukhina M.T. *Primeneniye regulyatorov rosta kompleksnogo deystviya na urozhaynost' i kachestvo zerna soi Vilana. Materialy 49-y Mezhdunarodnoy nauchnoy konferentsii molodykh uchenykh, spetsialistov-agrokhimikov i ekologov «Agroekologicheskiye osnovy primeneniya udobreniy v sovremennom zemledelii»* [The use of growth regulators with a complex effect on the yield and quality of grain of Wilan's soybeans. Materials of the 49th International Scientific Conference of Young Scientists, Agrochemists and Ecologists "Agroecological foundations of the use of fertilizers in modern agriculture"]. M.: VNIIA/All-Russia Scientific Research Institute of Automation/, 2015. Pp. 149–152.

5. Leshkenov A.M., Bizhoeva T.P. *Rol' bakterial'no-gribnykh preparatov v povyshenii urozhaynosti soi v zasushlivykh klimaticheskikh usloviyakh ravninnoy chasti tsentral'nogo Predkavkaz'ya* [The role of bacterial and fungal preparations in increasing the yield of soybeans in arid climatic conditions of the flat part of the central Ciscaucasia] // *Izvestia KBNC RAN* [News of the Kabardino-Balkarian Scientific Center of RAS]. 2020. No. 2 (94). Pp. 55–64.

6. Anisimova L.G., Zanilov A.Kh. *Effektivnost' predposevnoy obrabotki pochvy bakterial'no-vodoroslevym kompleksom. Innovatsii v APK: problemy i perspektivy* [Efficiency of pre-sowing soil cultivation with a bacterial-algal complex. Innovations in the agro-industrial complex: Problems and prospects]. No. 3 (15). 2017. Pp. 95–101.

7. Lifanenkova T.P., Bizhoev R.V. *Vliyaniye sistematicheskogo primeneniya udobreniy v usloviyakh bogary i pri dlitel'nom oroshenii na urozhaynost' kul'tur, produktivnost' zernotravyanopropashnogo sevooborota i plodorodiye chernozema obyknovennogo karbonatnogo v agrolandshaftnom zemledelii Tsentral'nogo Predkavkaz'ya* [Influence of the systematic use of fertilizers in rainfed conditions and with prolonged irrigation on crop yields, productivity of grain-grass-tilled crop rotation and fertility of ordinary carbonate chernozem in agrolandscape agriculture of the Central Ciscaucasia] // Agrochemistry. 2018. No. 4. Pp. 3–17.

8. Emtsev V.T., Mishustin E.N. *Mikrobiologiya: uchebnik dlya vuzov* [Microbiology: textbook for universities]. M.: Drofa, 2005. 445 p.

9. Nakaryakov A.M., Zanilov A.Kh. *Biologicheskaya aktivnost' organicheskikh poley OOO «Savinskaya Niva»* [Biological activity of organic fields LLC "Savinskaya Niva"] // *Innovatsii v APK: problemy i perspektivy* [Innovations in the agro-industrial complex: Problems and prospects]. 2017. No. 1 (13). Pp. 98–104.

10. Yakhtanigova Zh.M., Zanilov A.Kh. *Vliyaniye mineral'nykh, organicheskikh i mikrobiologicheskikh udobreniy na agrokhimicheskiye pokazateli pochvy i na razvitiye rasteniy* [The influence of mineral, organic and microbiological fertilizers on the agrochemical parameters of the soil and on the development of plants] // *Nauchnoye obozreniye* [Scientific review]. 2015. No. 6. Pp. 14–18.

Information about authors:

Leshkenov Aslan Mukhamedovich, postgraduate student of the Scientific and Educational Center of KBSC RAS.
360000, KBR, Nalchik, 2, Balkarov street.
E-mail: aslan.leshckenov@yandex.ru

Zanilov Amiran Habidovich, Associate Professor of the Department of Intelligent Agroecosystems of the Scientific and Educational Center of KBSC RAS.
360000, KBR, Nalchik, 2, Balkarova street.
E-mail: agro-centr@inbox.ru