

ANALYSIS OF THE EFFECTIVENESS OF THE USE OF SOFTWARE AND ROBOTIC SYSTEMS FOR THE PROTECTION OF AGRICULTURAL CROPS FROM DISEASES, PESTS AND WEEDS

M.A. KANOKOVA

Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences
360002, Russia, Nalchik, 2 Balkarov street

Annotation. When growing cultivated plants of the field and fruit trees of the garden, one of the most important indicators of the effectiveness of the agricultural equipment and various kinds of chemicals and mineral fertilizers used is harvesting without quantitative and qualitative losses. Choosing the right methods to protect plants from pests, diseases and weeds can save crops and orchards from significant crop losses, lead to higher yields and increased income.

Keywords: plant protection, precision farming, hardware and software systems, robotic systems, intelligent systems, agriculture, agricultural producers, plants

REFERENCES

1. Yadchenko V. From mechanization to robotization. *Nauka i innovatsii* [Science and innovation]. 2021. No. 3 (217). Pp. 17–20. (In Russian)
2. Vlasenko N.G., Korotkikh N.A. Pros and cons of the agrotechnical method of plant protection. *Zashchita i karantin rasteniy* [Journal of Plant Protection and Quarantine]. 2012. No. 2. Pp. 16–19. (In Russian)
3. Savchenko S.D. Using the biological method of plant protection from arthropod pests in the Vologda region. *Nauchno-metodicheskiy elektronnyy zhurnal «Kontsept»* [Scientific and methodological electronic journal «Concept»]. 2015. No T13. Pp. 4386–4390. (In Russian)
4. Afanasyev R.A., Ermolov I.L. On the prospects of precision farming robotization. *Mekhatronika, avtomatizatsiya, upravleniye* [Mechatronics, Automation, Control]. 2016. Vol. 17. No. 12. Pp. 828–833. DOI: 10.17587/mau.17.828–833. (In Russian)
5. Balabanov V.I., Belenkov A.I., Berezovsky E.V., Egorov V.V., Zhelezova S.V. *Navigatsionnyye tekhnologii v sel'skom khozyaystve. Koordinatnoye zemledeliye* [Navigation technologies in agriculture. Coordinate agriculture. Tutorial.]. Uchebnoe posobie. Moscow: Izdatel'stvo RGAU-MSKHA imeni K.A. Timiryazeva.[Russian State Agrarian University n.a. Timiryazev Publishing House] 2013. 117 p. (In Russian)
6. Uzhinskiy A., Ososkov G., Goncharov P., Nechaevskiy A., Smetanin A. One-shot learning with triplet loss for vegetation classification tasks. *Computer Optics*. 2021. Pp. 608–614. DOI: 10.18287 / 2412-6179-CO-856.
7. Uzhinskiy A., Ososkov G., Goncharov P., Nechaevskiy A., Multifunctional platform and mobile application for plant disease detection. *Proceedings of the 27th Symposium on Nuclear Electronics and Computing. CEUR Workshop Proceedings 2507*. 2019. Pp. 110–114.
8. Goncharov P., Uzhinskiy A., Ososkov G., Nechaevskiy A., Zudikhina J. Deep Siamese Networks for Plant Disease Detection. *EPJ Web of Conferences*. EDP Sciences. 2020. Vol. 226. 03010 p.
9. Luneva N.N. Weeds: origin and composition. *Vestnik zashchity rasteniy* [Bulletin of plant protection]. 2018. No. 1 (95). Pp. 26–32. (In Russian)
10. Bazdyrev G.I. *Sornyye rasteniya i mery bor'by s nimi v sovremennom zemledelii* [Weed plants and measures to control them in modern agriculture]. Moscow: Izdatel'stvo MSKHA, 1993. 242 p. (In Russian)

11. Saveliev V.A. *Sornyye rasteniya i mery bor'by s nimi: uchebnoye posobiye* [Weed plants and measures to combat them: a tutorial]. Saint Petersburg: Izdatel'stvo «Lan». 2018. 295 p.

Information about the author

Kanokova Madina Alikovna, Head of Laboratory "Development of models for promoting innovative projects" of the Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;
360000, Russia, Nalchik, 37-a I. Armand street;
kanokova.madina@yandex.ru, ORCID: <https://orcid.org/0000-0001-5313-1360>