

SERGII YA. KOTS

Director of the Institute of Plant Physiology and Genetics of the National Academy of Sciences of Ukraine; Head of the Department of Symbiotic Nitrogen Fixation, Institute of Plant Physiology and Genetics of the National Academy of Sciences of Ukraine

Born in 1965; 1992-1997 − Researcher at the Department of Symbiotic Nitrogen Fixation of the Institute of Plant Physiology and Genetics (IPPG) of the National Academy of Sciences of Ukraine (NASU; 1997-2002 − Scientific Secretary of the IPPG NASU; 2002-2025 − Deputy Director for Research of the IPPG NASU; since 1998 − Head of the Department of Symbiotic Nitrogen Fixation; since 2025 − Acting Director of the IPPG NASU.

Main research interests: physiology of symbiotic nitrogen fixation; cellular and genetic engineering of nitrogen-fixing microorganisms; elucidation of the physiological, biochemical, and molecular-genetic mechanisms of interactions between nitrogen-fixing microorganisms and plants; development of new microbial strains using genetic engineering and classical breeding methods; investigation of the ecological and genetic foundations for the design of effective plant–microbe systems; and development of approaches to optimize and enhance biological nitrogen fixation from the atmosphere in order to increase the productivity of agricultural crops.

ORCID: https://orcid.org/0000-0002-3477-793X

Scopus: https://www.scopus.com/authid/detail.uri?authorId=7801633478

Google Scholar: https://scholar.google.com/citations?hl=uk&user=Eh-eAT4AAAAJ&view_op=list_works&sortby=pubdate

Scientific Advisory Boards and Committees (current membership)

- Deputy Academician-Secretary of the Bureau of the Division of General Biology of the National Academy of Sciences of Ukraine;
- Deputy Chair of the Doctoral Degree Award Committee at the Institute of Plant Physiology and Genetics of the National Academy of Sciences of Ukraine;
- Expert of the Joint Commission for awarding the Verkhovna Rada of Ukraine Prize to Young Scientists and the Verkhovna Rada of Ukraine Scholarships for Young Scientists.

Membership in Scientific Societies

- Vice-President of the Ukrainian Society of Plant Physiologists (USPP).

Academic Degrees and Titles

- Corresponding Member of the National Academy of Sciences of Ukraine, elected in 2015, Institute of Plant Physiology and Genetics of the NAS of Ukraine;
- Professor of Plant Physiology, 2006;
- Senior Researcher, 2005;

- Doctor of Biological Sciences, 2002, Institute of Plant Physiology and Genetics of the NAS of Ukraine;
- Candidate of Biological Sciences (=PhD), 1990, Institute of Plant Physiology and Genetics of the NAS of Ukraine.

Editorial Activities

- Editor-in-Chief of the journal **Plant Physiology and Genetics** (Ukraine);
- Member of the Editorial Board of the journal **Agricultural Microbiology** (Ukraine).

Honors and Awards

- State Prize of Ukraine in Science and Technology, 2012;
- V. Ya. Yuriev Prize of the National Academy of Sciences of Ukraine, 2016;
- M. G. Kholodny Prize of the National Academy of Sciences of Ukraine, 1998;
- D. K. Zabolotny Prize of the National Academy of Sciences of Ukraine, 2005;
- Prize of the National Academy of Agrarian Sciences of Ukraine **"For Outstanding Achievements in Agricultural Science"**, 2016;
- Insignia of the Order **"Saint Prince Volodymyr," 4th Class**, with the title **"Knight of the Order of Saint Prince Volodymyr"**, for a significant contribution to the development of Ukraine, services to the Ukrainian people, and charitable activities, 2012;
- Certificate of Merit from the Division of General Biology of the National Academy of Sciences of Ukraine for dedicated work and a significant contribution to the development of biological science, 2012;
- **Labor Glory Medal**, International Academy of Rating Technologies and Sociology **"Golden Fortune,"** 2013;
- Certificate of Merit of the Cabinet of Ministers of Ukraine for a significant contribution to the development of Ukrainian science, conscientious work, and high professionalism, 2014;
- Distinction of the National Academy of Sciences of Ukraine for professional achievements, 2015;
- Medal of the National Academy of Sciences of Ukraine **"National Recognition of Ukrainian Scientists 1918–2018,"** 2018;
- Letter of Appreciation from the National Academy of Sciences of Ukraine, 2021;
- Certificate of Merit of the Verkhovna Rada of Ukraine **"For Services to the Ukrainian People,"** 2023;
- Distinction of the National Academy of Sciences of Ukraine **"For Training a New Generation of Scientists,"** 2025.

Scientific Projects (Participation and Coordination)

- Ukrainian–Slovak project **"Changes in the Number and Activity of Soil Microorganisms during Black Locust Invasion"** (2017–2019), supported by the Slovak Academy of Sciences and the National Academy of Sciences of Ukraine;
- Principal Investigator of projects implemented within the targeted research programs of the National Academy of Sciences of Ukraine;
- Research projects under the institutional programs of the National Academy of Sciences of Ukraine;
- Head of a comprehensive program of activities aimed at preserving and ensuring the proper functioning of the scientific object of national heritage **"Collection of Strains of Symbiotic and Associative Nitrogen-Fixing Microorganisms of the Institute of Plant Physiology and Genetics"**;

Selected Publications

1. Ferus P., Bošiaková D., Konôpková J., Hoťka P., Kósa G., Melnykova N., Kots S. Allelopathic interactions of invasive black locust (*Robinia pseudoacacia* L.) with secondary aliens: the physiological background. *Acta Physiologiae Plantarum*. 2019. 41(182). P. 1–10
2. Mamenko T.P., Kots S.Ya., Mykhalkiv L.M., Homenko Yu.A. Phenylalanine ammonia-lyase enzyme activity in the symbiotic system *Glycine max – Bradyrhizobium japonicum* by seed inoculation different in activity and virulation strain and treatment with fungicides. *Mikrobiol. Z*. 2021. Vol. 83, No 4. P. 63–73
3. Morgun V.V., Kots S.Ya. Development of effective strains of nodule bacteria and microbial preparations based on them. *Sci. innov.* 2021. Vol. 17, No 2. P. 39–49.
4. Vorobey N., Kukol K., Pukhtaievych P., Kots S. Influence of carmoisine on the viability of *Bradyrhizobium japonicum* in vitro and physiological indices of soybean under symbiosis conditions. *Journal of Central European Agriculture*. 2021. Vol. 22, No 4. P. 735–747.
5. Kiriziy D., Kots S., Rybachenko L., Pukhtaievych P. Inoculation of soybean seeds by rhizobia with nanometal carboxylates reduces the negative effect of drought on N_2 and CO_2 assimilation. *Plant, Soil and Environment*. 2022. Vol. 68, No 11. P. 1–6.
6. Kots S., Kiriziy D., Pavlyshche A., Rybachenko L. Peculiarities of formation and functioning of the soybean–*Bradyrhizobium japonicum* symbiotic apparatus in relation to photosynthetic activity under the influence of seed protectants. *Journal of Microbiology, Biotechnology and Food Sciences.* 2022. Vol. 11, No 6. e3128. P. 1–5.
7. Kots S.Y., Rybachenko L.I., Khrapova A.V., Kukol K.P., Rybachenko O.R., Khomenko Y.O. Composition of pigment complex in leaves of soybean plants, inoculated by *Bradyrhizobium japonicum*, subject to metal nanocarboxylates and various-levels of water supply. *Biosystems Diversity*. 2022. Vol. 30, No 1. P. 80–87.
8. Nyzhnyk T., Pukhtaievych P., Kots S. The intensity of drought-induced oxidative processes in soybeans depends on symbiosis with *Bradyrhizobium* strains. *Journal of Central European Agriculture.* 2022. Vol. 23, No 2. P. 318–326.
9. Nyzhnyk T.P., Kots C.Ya., Kukol K.P. Influence of methyl jasmonate and salicylic acid as components of the cultivation medium for *Rhizobium* on formation of different-efficiency symbiotic systems *Glycine max – Bradyrhizobium japonicum*. *Microbiological journal*. 2022, 84(6). P. 38–49.
10. Nyzhnyk T., Kots S. Key role of phenol enzymes metabolism in the legume-rhizobial symbiosis under different water supply. *Biosystems Diversity*. 2023. 31(3). P. 1–8.

11. Vorobey N.A., Kots S.Ya., Kukol K.P., Pukhtaievych P.P., Patyka V.P. Viability of nodule bacteria *Bradyrhizobium japonicum* on soybean seeds by treatment with fungicides during extended storage. *Innovative Biosystems and Bioengineering*. 2023. 7(4). P. 12–24.
12. Kots S.Y., Rybachenko L.I., Kukol K.P., Pukhtaievych P.P., Khrapova A.V., Rybachenko O.R., Omelchuk S.V. Peculiarities of soybean-rhizobial systems subject to different levels of water supply following treatment with succinic acid and epibrassinolide. *Biosystems Diversity*. 2023. 31(4). P. 484–492.
13. Kiriziy D., Kots S., Stasik O., Pukhtaievych P., Kukol K., Rybachenko L. Effect of inoculation with diazotrophs and treatment with solution of trace elements obtained by nanotechnology on wheat. *Journal of Central European Agriculture*. 2024, 25(1). P. 110–119.
14. Kots S., Khrapova A., Rybachenko L., Pukhtaievych P. The influence of metal nanocarboxylates on the nitrogen-fixing activity of symbiotic soybean systems grown under field conditions. *Studia Biologica*. 2024. 18(1). P. 99–110.
15. Nyzhnyk T., Kots S., Pukhtaievych P. Rhizobium inoculant and seed-applied fungicide effects improve the drought tolerance of soybean plants as an effective agroecological solution under climate change conditions. *Front. Biosci. (Elite Ed).* 2024. 16(3). 23.
16. Vorobey N., Kukol K., Pukhtaievych P., Kots S., Kiriziy D. Relation of soybean productivity to the functioning of the symbiotic and photosynthetic apparatuses. *Studia Biologica*. 2024. 18(4). P. 93–108.
17. Kiriziy D., Obeziuk I., Mykhalkiv L., Kots S. Effect of salinity on the soybean plants symbiotic and photosynthetic apparatuses activity under inoculation by rhizobia with the addition of Ge and Mo nanocarboxylates. *Studia Biologica*. 2025. 19(2). P. 105–120.
18. Nyzhnyk T., Kiedrzyńska E., Kots S., Zalewski M., Kiedrzyński M. Alleviation of water stress in soybean symbiosis by salicylic acid and methyl jasmonate-activated *Bradyrhizobium*. *BMC Plant Biology*. 2025. V. 25. Article number: 862.
19. Nyzhnyk T., Kiedrzyński M., Kiedrzyńska E., Kots S. Salicylic and succinic acids as inducers of phytoimmunity in winter wheat for the management of powdery mildew (*Blumeria graminis* (DC) Speer f. sp. *tritici*). *BMC Plant Biology.* 2025. V. 25. Article number: 376.
20. Nyzhnyk T., Kots S. Chelated forms of trace elements as a promising solution for improving soybean symbiotic capacity and productivity under climate change. *Frontiers in Bioscience-Elite*. 2025. V. 17 (2). P. 33505.

.