

47th World Congress on Microbiology

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Innovative biofertilizers improving yields of horticultural crops and soil fertility

To obtain high yields in intensive horticultural and agricultural production, high levels of mineral fertilization combined with the application of chemical plant protection products are commonly used. This results in a loss of the biological potential and erosion of soils, which leads to deterioration in the quality and fertility of cultivated soils. An alternative to such production is the use of microbially enriched biofertilizers, biostimulants and composts. The aim of the study was to evaluate the effects of the applied microbial biofertilizers on the growth and yield of selected species of horticultural plants and to develop innovative technologies for improving the quality of soils. We have developed innovative consortia of beneficial microorganisms on the basis of the resources collected in SYMBIO BANK of the Department of Microbiology, Research Institute of Horticulture in Skierniewice. The results of the experiments demonstrated a positive influence of the biofertilizers on the vegetative growth and yielding of plants, and the occurrence of beneficial groups of microorganisms in the rhizosphere of those plants. As a result of the application of beneficial microorganisms combined with mineral fertilizers (urea and phosphorus fertilizers), significantly higher yields of the tested fruit and vegetable species were achieved, with better storage and processing qualities compared to conventional production. The use of beneficial microorganisms in the cultivation of horticultural plants will multiply their positive impact on the yield potential of horticultural plants and improve the quality of soils. Widespread use of the innovative biofertilizers in sustainable cultivation of fruits will help improve the quality of soils and increase the profitability of horticultural farms by reducing production costs.

Recent Publications

1. Paraszkiwicz K., Bernat P., Siewiera P., Moryl M., Sas Paszt L., Trzciński P., Jałowiecki Ł., Płaza G. (2017). Agricultural potential of rhizospheric *Bacillus subtilis* strains exhibiting varied efficiency of surfactin production. *Scientia Horticulturae* Vol. 225 (2017): 802-809.
2. Derkowska E., Sas Paszt L., Głuszek S., Trzciński P., Przybył M., Frąc M. (2017). Effects of treatment of apple trees with various bioproducts on tree growth and occurrence of mycorrhizal fungi in the roots. *Acta Scientiarum Polonorum, Hortorum Cultus* 16 (3): 75-83.
3. Mosa W.F.A.E-G., Sas Paszt L., Frąc M., Trzciński P. (2016). Microbial products and biofertilizers in improving growth and productivity of apple – a review. *Polish Journal of Microbiology* Vol. 65 (3): 243-251.
4. Sas Paszt L., Malusa E., Sumorok B., Canfora L., Derkowska E., Głuszek S. (2015). The influence of bioproducts on mycorrhizal occurrence and diversity in the rhizosphere of strawberry plants under controlled conditions. *Advances in Microbiology* 5: 40-53.
5. Derkowska E., Sas Paszt L., Trzciński P., Przybył M., Weszczak K. (2015). Influence of biofertilizers on plant growth and rhizosphere microbiology of greenhouse grown strawberry cultivars. *Acta Scientiarum Polonorum Hortorum Cultus* 14 (6): 83-96.
6. Sas Paszt L., Trzciński P., Bakalarska M., Hołownicki R., Konopacki P., Treder W. (2014). The influence of heated soil in crop of 'Tamaris' tomato plants on the biological activity of the rhizosphere soil. *Advances in Microbiology* Vol.4 No.4: 191-201.

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7. Lisek A., Sas Paszt L., Trzciński P. (2014). Identification and Assessment of Genetic Similarity of Soil Bacterial Isolates of *Pseudomonas* spp. Using Molecular Techniques. *Polish Journal of Microbiology* Vol. 63, No 3: 291-298.
8. Sas Paszt L., Sumorok B., Malusá E., Głuszek S., Derkowska E., (2011). The influence of bioproducts on root growth and mycorrhizal occurrence in the rhizosphere of strawberry plants cv. 'Elsanta'. *Journal of Fruit and Ornamental Plant Research* 19 (1): 13-34.

Biography

Coordinator or investigator of more than 15 European and national research projects, e.g. technical coordinator of the European CRAFT Project ("Ensuring the quality of innovative crop growth inputs derived from biological raw materials," 2004-2006) and leader of the project financed from structural funds – the Innovative Economy Program ("Development of innovative products and technologies for organic fruit production," 2009-2015). Expert in evaluation of EC project proposals in FP6, FP7 and HORIZON 2020. Expert of the EC Programme Committee on 'Food Quality and Safety' in FP6 and in FP7 on 'Food, Agriculture and Fisheries, and Biotechnology'. Expert to EFSA (European Food Safety Authority).

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