

The implementation of new mechanical and autonomous automated technologies for the sustainable production of grapes in vineyards

Leading partner: University of Maribor, Faculty of Agriculture and Life Sciences

Other partnership members: University of Ljubljana – Faculty of Mechanical Engineering, Agricultural Institute of Slovenia, Chamber of Agriculture and Forestry of Slovenia – INSTITUTE OF AGRICULTURE AND FORESTRY NOVA GORICA, Chamber of Agriculture and Forestry of Slovenia – INSTITUTE OF AGRICULTURE AND FORESTRY MARIBOR, Interexport d.o.o., DVERI-PAX d.o.o., Farms: Vinko Šerbinek, Katarina Puhan, Dora Petrič, Marjan Simčič, Miha Toplišek

Project duration: from 22 November 2019 to 22 December 2022

Project topic: Sustainable production of grapes for wine and fresh fruit

Exchange of experience: The operational group sees great potential for an international upgrade of the EIP-AGRI project in the use of drones for Biodiversity Conservation, Ecological Monitoring and precision pest management in vineyards and their surroundings. We are always open to cooperation with foreign partners because we want to share experience in the field related to biodiversity and precision agriculture.

Practical problem:

- ✓ The process of applying spray mixture in vineyards is still uncontrolled to a large extent.
- ✓ Conservation of native biodiversity in vineyards and their immediate surroundings.
- ✓ Searching for alternative and innovative ways of weed control without using the herbicide glyphosate.
- ✓ The appropriate procedure for measuring ripening of grapes in vineyards.

Project purpose and goals

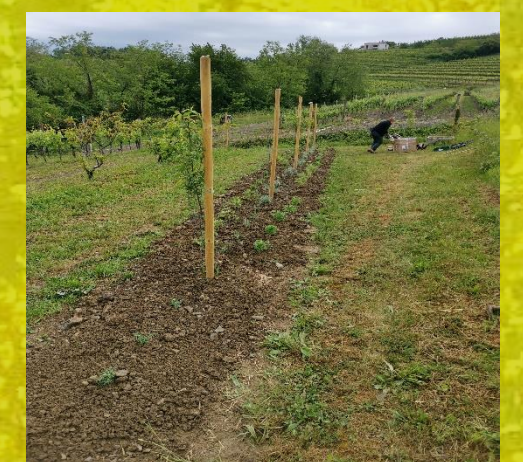
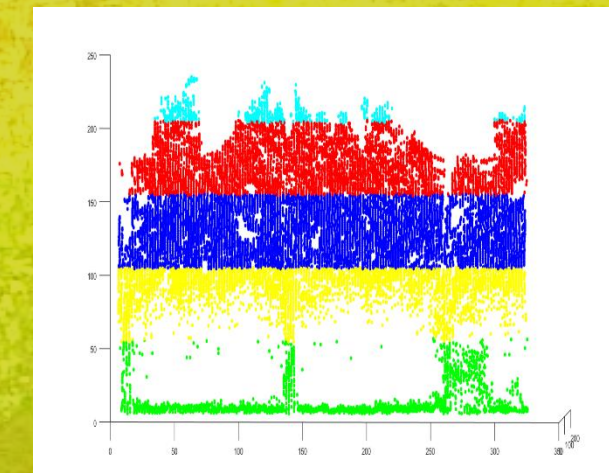
- ✓ Reduction of quantities of plant protection products used in vineyards and of their impact upon immediate surroundings.
- ✓ Demonstration of various alternative weed control systems in the area below vine.
- ✓ Planting rare species in agroecosystems (vineyards) to revitalise the growth of native useful plants.
- ✓ Implementation of an advanced procedure of measuring the ripening of grapes.

Expected results

- ✓ Developed prototype (autonomous automated modular systems for measuring spray mixture in vineyards that will be placed on classical sprayers and that will enable the end user to apply spray mixture in an autonomous and automated way).
- ✓ Weed control in vineyards at the end of growth period by means of various alternative systems, results regarding the quantity and quality of products and cost comparison of various weed control systems will be submitted to farms.
- ✓ Native plants will contribute to the increase in biodiversity of vineyards. Promotion of the use of native wild fruit species will contribute to the general awareness about their significance and will encourage winegrowers to start using them again.
- ✓ Faster and more effective measuring of the ripening of grapes in vineyards in comparison to the currently used measuring systems.

Current project results

- ✓ Digital reconstruction of various development phases of vine and evaluation of leaf area wall.
- ✓ In two tests (Škerbinek wine growing farm and company Dveri-Pax), weed control was carried out three times a year, whereas in the test performed at Petrič farm in Slap pri Vipavi only two weed controls a year were carried out. In all three locations, more than 30 weed species grew in the vineyards. For each weed species, weed control efficiency was analysed three times a year.
- ✓ Start of the practice of measuring the ripening of grapes (Vinko Šerbinek farm and company Dveri-pax).



Farmer's opinion:

We, farmers, are very happy to be able to participate in the EIP project as, in this way, we directly cooperate when developing a new, environmentally friendly technology of cultivation and protection of crops that are being lost to a large extent due to the increasing growing of monoculture crops and of invasive non-native plants in our rural areas.

Consultant's opinion:

Experts from different fields participate in the project, which enables the exchange of opinions from many different fields and increases the possibilities of acquiring new knowledge. We enjoy our participation in the project as we are well aware that we are an integral part of a working group that will be able to prepare results that will be permanently useful, and that will bring benefits to growers and will be beneficial also for the nature.

Researcher's opinion:

With scientific research in the field of developing new processes, technologies, practices and products, researchers wish to transfer them directly to practical work of farmers and consultancy services and to jointly enable sustainable production of wine grapes for producing wine and for fresh fruit.

Dr. Peter Berk, peter.berk@um.si

Project web page: <http://www.fkbv.um.si/index.php/raziskovalna-dejavnost-fkbv/projekti/60-vsebina/4511-uedbav-novih-mehanskih-in-avtonomnih-avtomatiziranih-tehnologij-za-trajnostno-pridelavo-grozdja-v-vinogradih>