IPM adoption in my hub

Facilitation approach and progress made in IPM adoption

Jože Miklavc, MSc
Chamber of Agriculture and Forestry of Slovenia– Institute of Agriculture and Forestry Maribor (KGZS – Zavod Maribor), Vinarska 14, 2000 Maribor Slovenia

My group

KGZS - Zavod MB

KGZS is located in the hilly region of Podravje, NE Slovenia, where viticulture and fruiticulture are key sectors. It focuses on sustainable rural development, supporting economic activities, and innovative business approaches combining environmental and social potentials. The institute offers advice, education, and services in agricultural production, plant protection, and economics. It is a key stakeholder in policy development and facilitates stakeholder dialogues, values ecosystem services, and promotes cross-sectoral cooperation and awareness of sustainable development and innovative Green Deal initiatives.

THE HUB

The Slovenian IPM HUB was launched as part of the IPMWORKS project. It is somewhat different from other hubs, as it includes the sectors of arable crops, vineyards, and orchards. A total of 10 farmers are located in the same region, Podravje, in the northeastern part of Slovenia. The aim of our hub is to create a favorable environment for farmers to exchange, learn, test, and demonstrate cost-effective IPM solutions.

OBJECTIVES AND MOTIVATIONS OF THE FARMERS

Technical: reduction of pesticide use, optimization of the production process, transfer of good IPM practices, involvement of farmers in empirical research and on-farm testing.
Environment: to promote local environmental sustainability, to increase biodiversity, to reduce the carbon footprint, the community will become more efficient with food and energy.
Economic, social: introduce consumers to successful IPM methods, support local economic and social stability, create new jobs by involving the young generation

DRIVERS

Technical: Researchers, technicians, advisers, and companies should collaborate on effective Integrated Pest Management (IPM) methods for controlling various diseases and pests in orchards. This includes using confusion methods, weed and pest control (e.g., Eriosoma lanigerum, residues), spraying techniques, and developing new varieties.
Environmental: Local farmers should employ more sustainable farming practices (e.g. biotic protection) to preserve the environment and local biodiversity.
Economic and Social: Adopted IPM strategies by farmers optimize production costs, making farming more economically efficient. Associations of young farmers are crucial for sharing new knowledge and best practices on IPM methods, consequently creating new job opportunities on farms.

BARRIERS

Technical: Not enough is known about approaches to reduce the use of pesticides, more accurate prediction and monitoring of diseases, advice on the preparation of the spraying program is needed. Too little is being done on prevention and the development of resistant varieties.
Environmental: Increasingly frequent natural disasters such as frost, floods, landslides and hail storms are a major concern.
Economic and social: Slovenian medium and small fruit growers find it difficult to compete with large EU producers due to limited financial resources and marketing skills. Many young people leave farms due to bad economic conditions and generational conflicts.

IPM challenges and results

IPM Challenges

What were the main IPM challenges?

The European Commission aims to reduce the total use of pesticides by 50% by 2030. This strategy is a major challenge for European agriculture. Most of the public and media discussions are about reducing insecticides, where fungicides (40%) and herbicides (33%) account for a larger share. There are many IPM methods to reduce the use of herbicides, one of them is low undergrowth sowing in orchards. As an alternative to herbicides, annual flowers, perennials and low soybeans are planted. The control is represented by the existing undergrowth under the trees.

The hub's results

What progress has the hub made on these challenges?

In the hub, we explored alternatives to the use of glyphosate in an apple orchard with the TOPAZ variety. In the first year, 2021, we included mechanical soil treatments in a demonstration event. After successfully obtaining results, we further enhanced our findings by monitoring low-seeded grasses and soybeans in 2022 and 2023. Based on these monitored characteristics, we found that they exhibit positive attributes and yield good results. These selected methods have a favorable effect on increasing or ensuring the quality yields of apple trees.

What issues still need to be addressed?

The cost of integrated mechanical systems was higher than the cost of using herbicides. The transition to integrated processing could be encouraged by subsidized environmental sustainability measures. Farmers, however, have welcomed low cover seeding, as a higher percentage of cover significantly improves biomass compared to herbicides. These are key goals in achieving orchard biodiversity, improving soil quality and ultimately leading to long-term sustainability.

How are the hub farmers going to proceed?

The hub farmers are going to proceed by maintaining contact with plant protection services, technicians, teachers, hub coaches, and other farmers both within and beyond the hub to improve IPM methods on their farms. Together they will organize more demo events and field trips to share innovative and positive stories about IPM approaches. Additionally, they will focus on improving the prediction and monitoring of diseases, the spraying program, prevention measures, and the development of resistant varieties in orchards.

Key conclusions

Low undergrowth, annual flowers, perennial flowers and low soybeans are good alternatives to the glyphosate use.

They play a beneficial role by providing biodiversity and supporting ecosystem services.

Regulation of grass mixtures must be optimally adapted to growth.

Facilitation approaches

What is the issue the hub work on more precisely?

The demonstration event was held at the Marko farm, located in the municipality of Maribor, 10 km from the city center. Fruits and vegetables are grown on the farm, with apples being the primary crop, produced on 4 hectares. The farm faces the problem of controlling weeds under the trees. The farmer wants to avoid herbicides and find the best possible solution that is both effective and economically acceptable.

How did you proceed? What did you do?

In an apple orchard of the TOPAZ variety, the influence of different mixtures was tested in the inter-row space under the apple trees in a strip 30 cm wide on each side of the tree. Three different mixtures were chosen: a mixture of flowering perennials, a mixture of flowering annuals and soybeans. Through the experiment, the impact on the coverage of the entire interspecific space and coexistence with native plants was evaluated. As a result, the quantity of the crop, the vegetative growth of trees and the quality of apples or fruits were also evaluated.

Reduced use of pesticides with the IPM strategy of low undergrowth sowing in an apple orchard

What conclusions can you draw?

Low cover seeding has been well received by the farmer, as a higher percentage of cover significantly improves biomass compared to herbicides. This is a key goal in achieving biodiversity in orchards and improving soil quality without the use of herbicides.

My tips for making it work

Farmers are a very important part of the IPM hub, where they can openly discuss the problems they are facing. Together with the coach, technicians, advisers, and other farmers, they try to find the most suitable solutions. Trust between all relevant participants in the hub is very important, especially when working with the hub coach and other farmers who are facing the same issues. In the end, it works when the IPM approach works. **AND THIS ONE WORKS!**

Individual facilitation

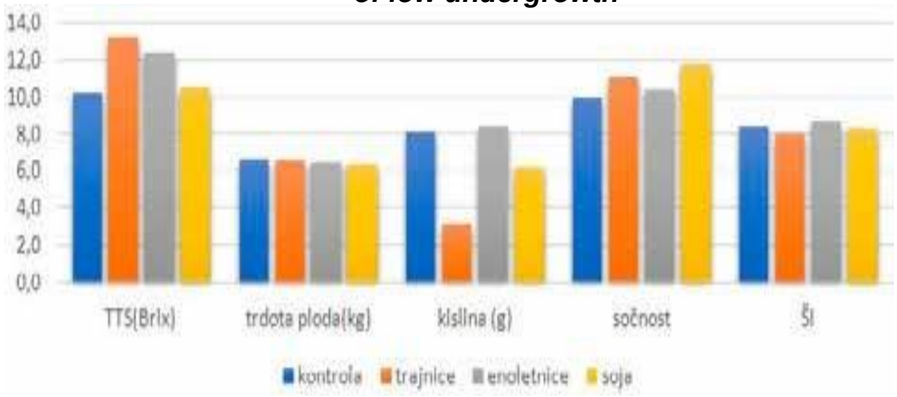
Regarding issues of weed control in apple trees, the farmer can personally contact the coach, the plant protection service, or the agricultural consultant through the public day service to determine the IPM approach (free of charge). The farmer regularly attends free training sessions on plant protection in the orchard and IPM treatments, which are organized every year by KGZS-Zavod MB. It is also important that they attend workshops, training sessions, or field trips and discuss problems and solutions with other farmers or farmers' associations, (Rural youth association, Professional Fruit Association of Slovenia,..).

Collective facilitation

Collective facilitation includes group discussions, research, and collaboration with relevant target groups and stakeholders such as policymakers, plant protection practitioners and advisers, farmers, and professional and other associations.
Learning and discussion opportunities are provided through demo events showcasing good practices, professional meetings, projects, conferences, lectures, annual consultations with farmers, round tables, and excursions.

IPM adoption & pesticide use

Fruit quality parameters of the Topaz variety in 2022 for the treatment of low undergrowth



Control f. perennials f. annual ssoybeans

A suitable cover crop is a mixture of grassy flowering plants, consisting of quality types of grasses and various meadow flowers. In our case, we also chose soy as a good alternative crop under the tree canopy. The recommended sowing rate is 100 to 120 kg/ha, which represents 60 plants/m². We selected the cover crop for its favorable influence on the soil. In an apple orchard, as discussed above, we found that soybeans can be a good non-competitive crop in the belt under apple trees, provided a low-growing variety with fewer pods is chosen. Cover crops improve conditions for the main crops, suppress weed growth, prevent erosion, and fertilize the soil.

“Low undergrowth, annual flowers, perennial flowers and low soybeans are good alternatives to the glyphosate use.

Jože Miklavc, MSc - coach

The demonstrated IPM method has a favorable effect on increasing the quality yields of apple trees. It plays a beneficial role by providing biodiversity, supporting ecosystem services, and reducing the use of pesticides. **Biserka D. Purgaj - adviser**

Through the results of the experiment, we found that the mixture of flowering perennials showed the best results. It is evident that in the fourth year after the experiment, this mixture maintained the best self-preservation ability and has good coverage and consequently positive effects on yield quantity, vegetative growth of apple trees, or quality.

Petra Marko, farmer

A European network of demonstration farms promoting low pesticide use and economically efficient management strategies

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