



AgriTech Solutions: Innovating VET for Sustainable Agriculture

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EXPERT CONSULTATIONS

Sustainable agricultural practices

Experts/organizations: ZZ "STUBA", TD DZP KLECHOVCE DOOEL, ADUT GVN, AG FUTURA Technologies, „KAV KOMERC AND AGRO KAV KOMERC", COMPANY „STOJCHEVI and WINERY ARBESKA", INDIVIDUAL FARMER MARJAN TANCHEV, LISA – KOM KAVADARCI, INDIVIDUAL FARMER STEFAN STOJCHEV, AGRIJA DOOEL, Individual farmers groups and individuals, IZ Branko Atanasov, Livestock farm

Engaged teachers: Stefanovski Saso, Milosheva Zaklina, Jovanova Kristina, Doncheva Milica, Nikolov Efremcho, Slavkovic Sonja

Location: Kumanovo, Sveti Nikole, Skopje, Strumica, Kavadarci, Valandovo, Veles

Short description

Company "Stojchevi " village Sopot, Kavadarci, a small family winery known as „ Arabeska as an example of Sustainable Agricultural Practices.

According to the owner of the winery, it was founded in 2021 and the entire

Wine production or all wine is made from raw materials or own vineyards of about 1.6 ha. This enables sustainable agricultural development and practice. The main wine varieties are: Vranec, which is one of the most famous autochthonous grape varieties that is sprayed with preparations on the permitted or Green List, organic preparations and organic fertilization is carried out and from it the much-loved and powerful wine Vranec (red wine), further Rkiceli (white wine) and Rose from the Vranec variety are produced.

The winery has also won a Grand Gold Award at wine festivals for its Rose wine (from the Vranec variety).

This family winery plans to expand its range of highly sought-after wines, namely: Rhine Riesling and Cabernet Sauvignon.

The winery also has its own apartments located in the village of Sopot, just 6 km from the Municipality of Kavadarci, and accepts reservations for 12 guests. So, in addition to wine tourism, the company has also developed rural tourism as a promising sustainable agricultural practice, which should be increasingly practiced in our country. The goal is to attract as many tourists as possible to visit this beautiful small family winery, located in the heart of the Tikvesh region. **Sustainable agricultural practices in viticulture**

- Application of compost to improve soil fertility using organic matter fertilization,
- Precise irrigation with an installed drip system for reduced consumption on the water,
- Biological protection against diseases and pests using (beneficial insects and natural preparations),



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- Soil erosion control through the planting of cover crops between the rows.

- Rational use of agricultural machinery, in order to reduce harmful gas emissions.

Sustainable practices in winemaking

- Using energy-efficient processes in wineries such as: LED lighting and solar panels,

- Reducing waste and glass and recycling them,

- Efficient water management in washing and cooling processes, - Use of environmentally friendly packaging materials,

- Introducing standards through CO₂ monitoring,

Development of wine and rural tourism

- Promotional measures for indigenous and local grape and wine varieties and their use traditional production techniques,

- Formation of wine trails, tastings and guided tours through the vineyards and the winery,

- Development of agritourism and development of small rural accommodation capacities,

- Connecting wineries with cultural events and crafts and promoting local gastronomy,

- Development of marketing through the use of partnerships with travel agencies and the use of digital platforms.

The question arises, what are the main goals of sustainable agricultural practices? First of all, maintaining ecological balance, economic viability of the farm, as well as social responsibility and care for the community.

A group of individual farmers believes that the increasing investment in the use of drip irrigation systems saves on irrigation water, which improves yield and quality, although a small percentage of producers still rotate crops, they still save on the soil itself with nutrients and the use of artificial fertilizers. Raising domestic livestock leads to the production of domestic manure, which is used in the production of crops.

TD DZP Klechovce DOOEL is a company founded in 2008, which deals with agricultural production and trade in seed materials, fertilizers and plant protection products. In the course of its work, and with the aim of successful and stable production of agricultural products, the company applies appropriate sustainable agricultural practices that are recognizable in the Region.

Sustainable agricultural practices are production methods that provide healthy and high-quality food while protecting natural resources (soil, water, air) and preserving biodiversity for future generations. They are the foundation for long-term successful agriculture and are applicable to both small and large farms.

Basic sustainable agricultural practices:

Crop rotation/crop rotation



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Rotating different types of plants from season to season significantly improves soil fertility and reduces the occurrence of pests and diseases.

Composting and organic fertilization

Using organic waste to produce natural fertilizer, in order to improve soil structure and nutrition.

Reduced use of chemicals

Application of so-called integrated pest management, which means using natural methods before chemical methods.

Preference for biological preparations and biopesticides for dealing with diseases and pests.

Using renewable energy sources

Solar panels, biomass, small windmills, which will ultimately lead to a significant reduction in greenhouse gas emissions and dependence on fossil fuels.

Efficient use of water

Application of drip irrigation systems and moisture sensors, in order to save water and preventing soil salinization.

Soil protection and improvement

Avoiding over-cultivation and erosion, sowing "cover crops" to protect and enrich the soil.

Local and seasonal production

It reduces transportation and pollution and stimulates the local economy.

Crop diversity (agrobiodiversity)

Cultivation of different varieties and types of plants to increase resistance to climatic and biological risks.

What are the goals of sustainable practices?

First of all, Ecological Balance, then, Economic Sustainability of the Farm, as well as Social responsibility and care for the community.

Conclusion

Sustainable agricultural practices enable a harmonious relationship between people, land and the environment. They are the key to long-term successful and environmentally friendly agriculture production.

Sustainable agriculture is gaining momentum in the scientific community, becoming more and more interesting for upgrading knowledge. Using a drip irrigation system saves water use, improves yield and quality, and changing crops saves the soil itself with nutrients. Raising domestic livestock leads to the production of domestic manure, which is used in the production of crops. However, despite the great advantages of sustainable agricultural practices, we are also faced with shortcomings, i.e. lack of education or insufficient understanding that

Changing crops and how is quite important for increasing nutrients in



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soil, even for environmental protection, education in the application and preparation of organic fertilizers for soil improvement.

As a result of the large amount of materials and literature that can be found on the internet, it allows curricula to be upgraded with both theory and practical examples, which will enable the improvement of generations and their upgrading.

Books:

1. Principles of Agronomy for Sustainable Agriculture – Francisco J. Villalobos & Elias Fereres (2nd edition, 2024)

A comprehensive text that explains the agronomic basis of sustainable agriculture, including topics such as crop energy balance, water balance, resources, and techniques for effective productivity with sustainability.

[SpringerLink](#)

2. Sustainable Agriculture: Theories, Methods, Practices and Policies (MDPI, 2024)

Comprised of updated theories, methods, and policies, this reissued work from MDPI brings to the fore concepts of organic, circular, and ecological agricultural frameworks. [MDPI](#)

3. Sustainable Agriculture and Climate Resilience (MDPI, 2024)

A book exploring the link between sustainable practices and climate change resilience — with applications for both farmers and policymakers. [MDPI](#)

4. Sustainable Agriculture Reviews – Eric Lichtfouse (editor, 2017)

A peer-reviewed series presenting the latest research and innovative solutions for sustainable food and energy production. [SpringerLink](#)

5. Toward a Sustainable Agriculture: Farming Practices and Water Use (MDPI, 2017)

Open access (PDF), this edition targets water use and agricultural practices that contribute to sustainability, particularly relevant in climate change. stress.



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