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Wine tourism and the introduction of new technologies in winemaking and viticulture

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Abstract. This paper, provided by the authors, focuses on the prospects for the development of wine tourism in the southern regions of the Russian Federation. Unlike a beach holiday, for obvious reasons unpopular in winter, wine tourism is a year-round phenomenon. The most important factor in the successful development of this type of business is familiarizing tourists with the latest technologies in winemaking and viticulture. These technologies are based on digitization of agriculture, the introduction of elements of precision farming, digital mapping and yield planning, parallel driving systems, Internet of Things (IoT), the use of unmanned tractors (combines) and robotics.

1. Introduction

Wine tour is a type of tourist program, the main purpose of which is to acquaint the tourist with the wine-making of a given country or region. Such routes are designed for wine lovers and connoisseurs, both beginners and experienced. During the trip, guests familiarize themselves with the wine list of the country, enjoy the rural landscapes of wine-growing areas, visit castles and farms, take part in agricultural activities (for example, pruning or grape picking), inspect wine cellars. In addition, many programs include pleasant bonuses: the ability to make your own blend and get a bottle of wine with an individual label [1, 2]. The most important factor in the successful development of this type of business is familiarizing tourists with the latest technologies in winemaking and viticulture. These technologies are based on robotization, digitization of agriculture, the introduction of elements of precision farming.

2. Trends in the development of wine tourism or enotourism in the tourism market of the southern regions of the Russian Federation

The viticulture and winemaking in Russia have their origins from about the III century BC from the territory of Fanagori. This is primarily due to the climatic features of the territory.There were periods of decline and growth, but the beginning of the revival occurred in the early 17th century, during the entry of the southern territories into the Russian Empire, in particular, the Kuban, a part of the territory of the Don, as well as Dagestan. After the capture of Azov, by order of Peter I, industrial viticulture and winemaking began on the Don River, and vineyards were planted near the village of Razdorskaya.

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On the scientific basis, viticulture and winemaking in Russia began to develop only at the end of the 18th century. During this period, the first school of winemakers in the Crimea appeared, a center for scientific research on viticulture was opened, and the first industrial production of sparkling wines in the Crimea and Abrau-Durso was organized. In modern Russia, the basis of vineyards and winemaking is Krasnodar Territory, about 60% of the crop, the rest is in the Rostov region, Stavropol region, the republics of the North Caucasus and now the Crimea. All areas have their own specific features of climate and infrastructure [3].

Wine tourism or enotourism, is a new direction in the tourist market of the Russian Federation and is represented so far to a small extent.

Wine tourism existing in the national market can be divided into three groups:

- Economy Tours that include wine tastings, visits to wineries or wine festivals, but are not considered as exceptional wine tours. The cost of individual excursions can range from 745 to 7,000 rubles.
- Thematic tours, they include a trip to the famous wineries of a particular region. The cost of such tours is much higher, it is about 150,000 rubles for 4-5 days of the tour.
- The third group of tours includes tours, the main audience of which are people whose professional interests lie in the field of wine or gastronomy, and simply discerning customers. Such tourists prefer individual routes: they are willing to pay for exclusivity. The cost of such tours is calculated individually [4].

In our country, wine tourism is just beginning to form. Specialized excursions are offered in Anapa, Gelendzhik, Temryuk districts to wineries and cellars. For example, a tour of the winery "Abrau-Durso" - the largest Russian company producing sparkling wine according to the classical technology. The excursion includes a story about the method of preparation, the properties of wines, visiting wine cellars and tasting different sorts of champagne.

Unlike a beach holiday, for obvious reasons unpopular in winter, wine tourism is a year-round phenomenon. In winter, it is even more interesting to travel around wineries, since seasonal production has already been completed and most specialists are available for communication.

The principles of organizing wine tourism in the southern regions of our country are very simple: it is necessary to taste wines only in the places of their production in order to firmly connect the bouquet and taste of the drink with the secret of its origin in nature, history and the spirit of the area.

Traditions of the southern Russian winemaking go into deep antiquity. Even before our era, wine from the Crimean Peninsula was exported all over the coast of the Black and Mediterranean Seas, along the Great Silk Road and to the countries of northern Europe. Today in the Kuban and Crimea there are more than one hundred brands of high-quality wine. Many wines are made from grapes that grows in a very limited area with its climatic features. Examples of such varieties can serve as "White Muscat of the Red Stone", "Kokur Kaczynski".

Now many travel agencies offer the tour “Wine Road of the Black Sea Coast of Russia”. The concept of this tour is that the creation of a network of local enogastronomic tourist routes along the peninsula will allow attracting tourists to the peninsula not only in summer, but also in the off-season.

The Crimean part of the “Wine Road of the Black Sea Coast of Russia” with a total length of about 480 km will cover almost the entire peninsula. It will consist of four sections: this is the south-eastern route, the southern coast route, the Sevastopol and the western one. The distance between adjacent routes will be no more than 50-70 km. As part of the project, a corresponding map has already been created, in which local wine routes, “wine villages”, enogastronomic objects, hotels, and the main sights of the peninsula are plotted. Maps will be distributed free of charge to tourists. The plans of the project initiators are to prepare wine reviews, a mobile application and a route site, create product catalogs, hold festivals and fairs at the Wine Road facilities, and provide discounts for tourists traveling along the road. Information about the main "wine attractions" plan to place on the road signs of the peninsula.

More than 10 wineries have joined the project. In addition to “Massandra”, special excursion and tasting programs for travelers of the “Wine Road” were developed by the “Golden Beam” agricultural firm, “Valery Zakharyin Winery”, “Koktebel” Vintage Wine Factory, Inkerman Vintage Wine Factory, “Solar Valley”, “Novyi Svet. "," Perovski Manor "," Mangup Manor "," Alma Valley ". About 40 industrial enterprises and farms expressed their desire to become partners of the “Wine Road of the Black Sea Coast of Russia”.

Within the project, tourists will be able to visit wine cellars, vineyards, buy wines, take part in harvesting, and get acquainted with local eco-products - oysters, cheeses, cooked according to special recipes, bread, sausages, vegetables and fruits.

3. Wine tourism and the latest technologies in winemaking. Modeling the development of winemaking in the southern regions of the country

In the process of organizing wine tours, it is necessary to take into account that the tourists may be interested not only in the traditional features of winemaking, but also in using the most modern technologies in this field such as "smart vineyard,"smart winemaking".

Among the technologies of precision farming in Russia, the most common systems of parallel driving, informatization and monitoring, mapping of yield and differential fertilization. Modern technology provides round-the-clock work in the fields. In addition, in agriculture, maps of fields are digitized and information databases are created.

Parallel driving systems improve the overall performance of agricultural machinery and the quality of its work. For example, equipment equipped with these elements can be used at night and reduces the impact of the “human factor”. Only to minimize any errors, it should be managed by highly skilled machine operators and agronomists. As a result of the application of these technologies, the costs of fuel, seeds, fertilizers, chemical means of protecting crops are reduced.

Maximizing the harvest, financial benefits and minimizing capital investments, minimizing the impact on the environment are the main drivers for the implementation of precision farming not only in Russia, but throughout the world.

Analysis of the results of the expert survey on the importance of implementing technological trends in the field of precision farming in Russia allowed us to identify in succession:

- digital mapping and yield planning;
- monitoring of crop condition using remote sensing;
- monitoring crop quality;
- local soil sampling in the coordinate system;
- determining field boundaries using satellite navigation systems, remote sensing (aerial or satellite photographic);
- use of big data (Big Date);
- differential use of growth regulators;
- parallel driving systems;
- artificial intelligence for agriculture;
- internet of Things (IoT) platforms (cyber-physical systems) for managing agricultural equipment, winemaking enterprise;
- the use of unmanned tractors (combines) and robotics.

As a rule, in modern large Russian vineyards, foreign planting machines are used for planting. Laser-guided landing machines are considered obsolete, while modern landing machines have already acquired GLONASS / GPS navigation.

However, it should be noted that there are no computer programs with a reliable mathematical model adapted to our Russian conditions. At this stage, precision farming software in Russia is a GIS package with minimal analysis of soil fertility formation processes.

Despite the current economic and political situation, the use of precision farming systems in Russia is at the same level as 42% of experts believe, and 42% believe that the use has increased.The main problems of the development of precision agriculture in Russia are associated most of the respondents with the lack of a state program and support for the development of this area in the country (32%), as well as the fact that the domestic industry practically does not produce such systems (25%) and there is a shortage of qualified specialists (22%).

The main reasons for the restrained attitude of managers and chief specialists of agribusinesses are associated with a significant lack of information about their advantages of such technologies (33%) and the high cost of equipment (33%).

The wine industry uses innovative technology, designing plantations so that machines can move between the vines and collect the fruits. The grape industry requires the solution of another problem: the selection of a grape variety with a hard skin to avoid possible mechanical damage. Mechanical harvesting of grapes allows you to reduce labor costs by 80%.

In the USSR, there were 1.265 million hectares of vineyards, the country was in second place in the world after Spain. This includes table and technical grapes. Today in Russia, if we consider and the Crimean vineyards - 104 thousand hectares. China in 1985 had 30 thousand hectares, today - 520 thousand

In 2018, 439 thousand tons of grapes were grown in our country. We reached the level of 1990, that is, in principle, we have great potential in terms of the number of grapes grown. Today, the volume of the Russian domestic wine market is approximately $ 9 billion. Imported wine makes up 38% of the market. But there are still 23% of the wine, which is made from imported wine materials, this is our resource, our reserve, so the market has the potential to grow.

The distribution of the share of factors affecting the development of winemaking and viticulture in the southern regions of our country, according to expert estimates, is presented in figure 1.

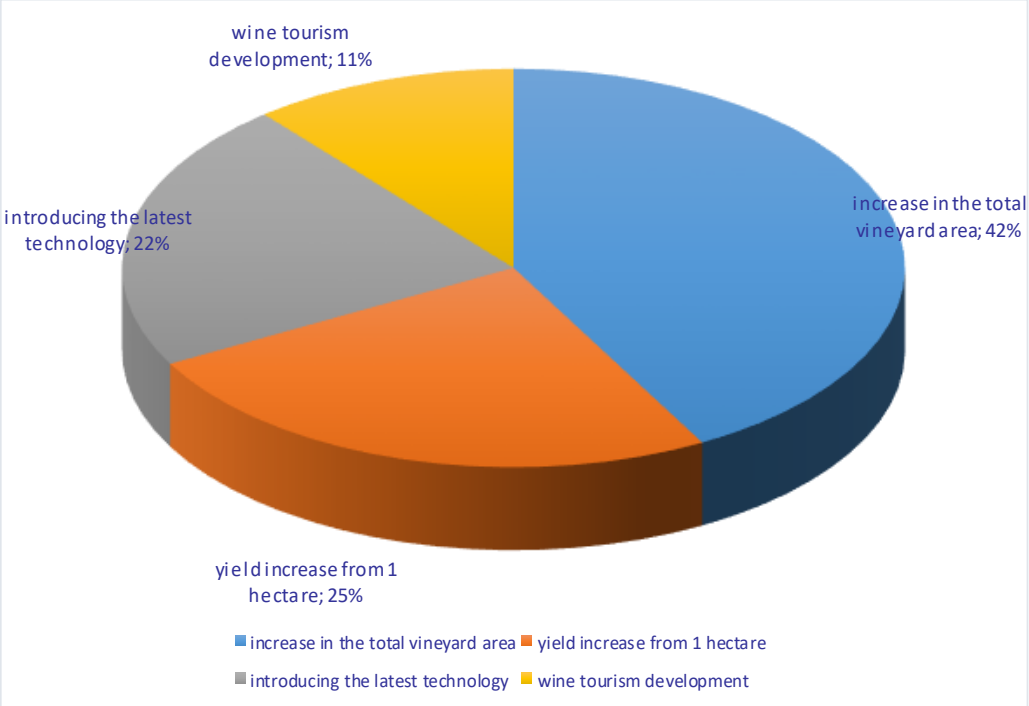


Figure 1. The distribution of the share of factors affecting the development of winemaking and viticulture in the southern regions of our country.

Figure 2 shows a block diagram of the model of the development of winemaking and viticulture in the southern regions of Russia in the SimuLink environment [5].

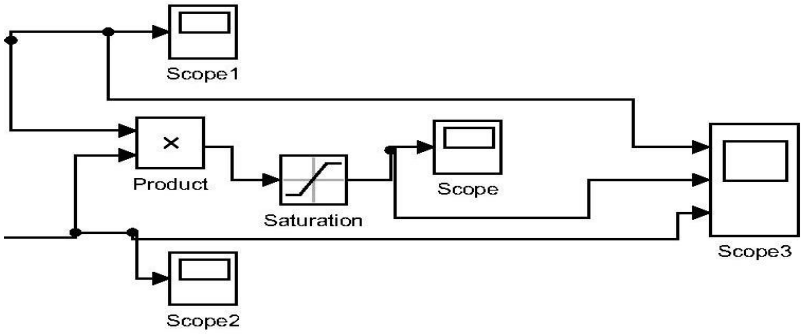


Figure 2. A block diagram of the model of the development of winemaking and viticulture in the southern regions of Russia in the SimuLink environment.

4. Conclusion

In this article, it was illustrated the possibilities of the development of wine tourism or enotourism in the tourism market of the southern regions of the Russian Federation. In the process of organizing wine tours, it is necessary to take into account that the tourists may be interested not only in the traditional features of winemaking, but also in using the most modern technologies in this field such as "smart vineyard, "smart winemaking". The use of such technological solutions, along with the traditional ones (expansion of the vineyard area, ensuring high yields from 1 hectare) will provide an opportunity for effective import substitution and additional income.

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References

[1] Charters S and Menival D 2011 Wine Tourism in Champagne J*ournal of Hospitality and Tourism Research* **35(1)** 102-18
[2] Vo Thanh T & Kirova V 2018 Wine tourism experience *Journal of Business Research* **83(C)** 30-7
[3] Dorofeeva A A 2018 Directions for the development of wine tasting tourism in the south of Russia *IEEE International Conference "Quality Management, Transport and Information Security, Information Technologies" IT&QM&IS-2018* (Saint-Petersburg: Saint Petersburg Electrotechnical University 'LETI') pp 836-8
[4] Getz D and Brown G 2006 Critical success factors for wine tourism regions: A demand analysis *Tourism Management* **27(1)** 146–58
[5] Kazak A N, Lukyanova Ye Yu and Chetyrbok P V 2017 One of the region of the southern federal district touristy flows dynamics modeling *IEEE II International Conference on Control in Technical Systems* (Saint-Petersburg: Saint Petersburg Electrotechnical University 'LETI') pp 103–5