

## SERBIAN VITICULTURE FROM THE 19TH CENTURY TO THE PRESENT DAY

Nebojša MARKOVIĆ, Zoran PRŽIĆ

University of Belgrade Faculty of Agriculture  
Nemanjina 6, Belgrade, Serbia

Coresponding author: [marne@agrif.bg.ac.rs](mailto:marne@agrif.bg.ac.rs)

### Abstract

*In Europe, the period from the 17<sup>th</sup> to the 19<sup>th</sup> century was marked by scientific and industrial revolution, better traffic communication, which strongly influenced development of viticulture and wine markets. New varieties are introduced into viticulture, intensive working on hybridization, more intensive cultivation methods are applied with use of horses, distance between plants are changed and more modern stock are used. After liberation from the Ottoman Empire, Serbian viticulture is developing again. With arrangement of the principality and then the Serbian Kingdom, in the overall development of Serbia under the Obrenović family, a significant contribution was made by new vine plantation. Apart from the Danube regions, the areas under vines are located around the Kopaonik mountain, which separates southern Serbia from the Novo-Pazarski sandžak and the wine-growing centers such as Negotin, Požarevac, Smederevo, Kruševac, Niš and Šumadija as a separate region (area about 98,326 ha).*

*However, the development of viticulture in Serbia is stopped by the appearance of phylloxera. The territory of Serbia was affected by phylloxera starting in 1881, and by 1920 it had reached Metohija. In order to restore damaged vineyards, were formed vine nurseries (Smederevo 1882, Bukovo near Negotin 1886, Jagodina 1889, Aleksandrovac, 1891) where began production of rootstock and grafting of European vine varieties. Since then, for the first time, varieties such as Traminac, Chardonnay, Pinot blanc, Pinot noir, Gamay were introduced into Serbian viticulture.*

*The beginning of the 20<sup>th</sup> century was marked by changing of royal dynasties, so after attending to Serbian throne, King Petar I Karađorđević (since 1903) form an endowment estate at Oplenac. King Petar I Karađorđević, and after them King Alexander, intensively participated in plantation of new vineyards, using planting material from nurseries from Smederevo and from France (1925). By 1935, the total area under vineyards amounted to 37.78,31 ha, of which 4/5 were under wine and 1/5 under table varieties. During the 2<sup>nd</sup> World War, Serbian vineyards was under significant damage due to the lack of conditions to bad cultivation in appropriate ways.*

*After the 2<sup>nd</sup> World War, viticulture in Serbia had several development stages. The first stage covers the period from 1945 to 1954 and is characterized by an extensive production level. The second stage, from 1954 to 1959, is characterized by vineyard with big inter-row distance of 2–2.5 m and greater mechanization using. The third stage, from 1959 to 1970, is characterized by vineyards with inter-row distance of 2.5 to 4 m. It is the period of intensive vineyards plantating. In the 1970, 106.000 ha belonged to individual sector, and 10.500 ha to the state (government) sector. In the 80-is and 90-is of the last century, it is period of the viticulture stagnation with significant reduction of vineyard area. The disintegration of the SFRY, wars that followed, sanctions and international isolation of Serbia and especially NATO bombing affected complete destruction of viticulture as a minor agricultural branch at that time. It is estimated that only about 20,000 ha under vine survived and could be maintained at the beginning of the XXI century. For the last twenty years, have been made efforts to restore Serbian viticulture. With a more modern approach, it started with the selection of clones of varieties mainly for producing of high quality wines. With*

*the formation of smaller and medium-capacity wineries (from 100,000 to 500,000 bottles per year), the situation in viticulture and wine sector has changed significantly through the increase of areas under vines and the improvement of wine quality. Today there are around 360 registered wineries in Serbia.*

**Key words:** Serbia, viticulture, varieties, areas, vines

## INTRODUCTION

Bearing in mind gen centers of grapevine and using historical facts - the spread of grapevine cultivation on Balkan Peninsula and Europe was done by the Thracians, who enter from Asia into Thrace. The Phoenicians and Greeks spread viticulture along the Mediterranean coast. Viticulture came to Greece from Egypt, probably through Phoenician traders who first brought it to Crete, and then it spread to the Peloponnese (about 3000 years before Christ). Wine was a very important commercial product to which, along olive oil, ancient Greece had a significant economic power. In addition, wine was considered a drink of gods, and many celebrations were held in honor of Dionysus, the god of wine. In literary works such as Iliad and Odyssey, but also in scientific texts from agriculture and medicine, Greek writers gave detailed descriptions of wine, varieties, ways how to grow grapevines, beneficial effects of wine on human health and other information about the importance of vines and wine (Democritus in the 5<sup>th</sup> century BC or Theophrastus in the 4<sup>th</sup> century BC).

The Romans continued to improve viticulture and winemaking process. Many Roman writers, such as Cato the Elder, Varron, Virgil, Pliny the Elder or Columella left valuable descriptions of grapevine. With the expansion of Roman empire, the cultivation of the vine quickly spread over vast expanses, especially in Gaul. From book *De Re Rustica* by the Roman writer Columella, it can be seen that viticulture was well developed in antiquity, and many

of the production methods known by the ancient Romans are still used today. The popularity of growing vines spread throughout the Roman colonies, especially in the Balkans. In the writings of Roman historians, it is said that "the army of Marcus Aurelius camped in the valley of the Dobroljubačka river and fortified themselves with wine from the extremely rich vineyard of the county (today's Aleksandrovac).

The decline of the Roman Empire led to the decline and stagnation of viticulture. Frequent attacks by barbarians, and then the establishment of feudal rule, stopped the era of progress, so from then on, vineyards could only be found in the vicinity of castles or monasteries. As in Europe, by the end of the 3<sup>rd</sup> century, viticulture had reached the northernmost borders of our country. Great migrations of people and wars had an impact on viticulture stagnation in the Balkan peninsula. On the other hand, the spread of Christianity and using of wine in religion contributed to development of viticulture.

## MATERIALS AND METHODS

In paper were analyzed historical writings and papers by a large number of authors. Part of the analyzed text and different papers comes from the monastery archives, while one part of the analyzed papers is preserved in state libraries in the country and abroad.

## RESULTS AND DISCUSSION

Medieval viticulture among the Serbs had a significant expansion, especially during the Nemanjić dynasty, but during

the Turkish conquests and rule (end of the 14<sup>th</sup> century to the middle of the 19<sup>th</sup> century), viticulture was in stagnation, especially in the cultivation of wine varieties and wine production. Many vineyards with wine varieties destroyed under prohibition on the consumption of wine (alcohol) prescribed by Islam. It is a period in which various old autochthonous varieties were irretrievably lost, as well as those that were brought from other countries and for which it took several centuries to acclimatize and in various random and deliberate selections to single out biotypes that could be grown in the Balkans. Probably because of their combined properties, they avoided the losing of autochthonous varieties of Serbia such as Prokupac, Smederevka, Plovdina, Tamjanika (they can be used both as varieties for table use and as varieties for wine making). In that period, the planting of table varieties was also encouraged, so it is considered that a large number of varieties were introduced from Asia (Minor) to the Balkan peninsula such as Afuz-ali, Chauš, Sultanija (Sultanina), Medna, Ćilibarka and others.

In Europe, the period from the 17<sup>th</sup> to the 19<sup>th</sup> century was period of scientific and industrial revolution, better traffic communication, which greatly influenced the development of viticulture and wine market development. New grapevine varieties are introduced, intensive work is done on hybridization, more intensive cultivation methods are applied with greater use of different equipment, planting distance are changed, and more modern leanings are used. The appearance of American diseases and pests is considered a turning point in the development of viticulture, which was at its peak in many parts of Europe in the middle of the 19<sup>th</sup> century. The development of viticulture was

hampered by the appearance and spread of fungal diseases that were transferred from America - powdery mildew in 1845 (*Erysiphe necator*, *Uncinula necator*), downy mildew in 1878 (*Plasmopara viticola*), and especially by the transfer of the dangerous phylloxera pest in 1864 (*Dactulospharia vitifoliae*, *Phylloxera vastatrix*), which in 30-40 years destroyed vineyards with European-Asian varieties, which until that time were grown on their own roots.

After liberation from the Otoman empire, Serbian viticulture is developing again. With the arrangement of the principality and then the kingdom of Serbia, in the overall development of Serbia under the Obrenovići dynasty, a significant contribution was made by establishing of new vineyards. Miloš's agrarian program said that the land belongs to the one who cultivates it. There was mass immigration and occupation of land and the formation of a free family peasant farm. Apart from these, large estates were quickly formed, the owners of which were elders in the new government, and later, through the accumulation of original and green capital, a new, domestic bourgeoisie. The expansion of viticulture and planting of new vineyards close to Kragujevac, Aranđelovac, Smederevo, Negotin, Kruševac, Kožetin (Aleksandrovac) has started. From the publication "La Serbie Economique et Commerciale" by Rene Mije, it can be seen that the Serbian viticulture of that era (from 1885-1900) was very similar to the viticulture of Hungary and Dalmatia. In addition to the Danube regions that he mentions in his report, he mentions the area around the Kopaonik mountain that separates southern Serbia from the Novo-Pazarski sandžak, describing endless vineyards "that endlessly cover the slopes and the

mountain foothills...". He mentions Negotin, Požarevac, Smederevo, Kruševac, Niš and Šumadija as a special region as wine-growing and winemaking centers with around 98,326 ha under vineyards. It emphasizes and describes the wines produced from these regions, whereby the importance of white wines and their quality is linked to Požarevac and Smederevo, and the red wines to Negotin, Kruševac, Niš and Šumadija. The most common varieties of this era are Prokupac, Začinak, Bagrina, Kavčina, Tamjanika, Smederevka, Slankamenka crvena, Ružica (Kevedinka), Limberger, Portugizac, Zelenika, Vranac, Grašac (Italian or Rhine Riesling).

However, the development of viticulture in Serbia is stopped again by phylloxera presence. The territory of Serbia was affected by phylloxera starting in 1881, and by 1920 it had presence on Metohija. The epidemic was officially declared in 1882. In order to restore damaged vineyards, vine nurseries were formed (Smederevo 1882, Bukovo near Negotin 1886, Jagodina 1889, Aleksandrovac, 1891) where the production of rootstock cuttings and grafting of European vine varieties had started. Since then, for the first time, varieties such as Traminac, Chardonnay, Pinot blanc, Pinot noir, Gamay black were introduced into Serbian viticulture.

During the 19<sup>th</sup> century, were made significant efforts in the construction of cellars for the storage and care of wine, the locally so-called. "pimnice", "pivnice" or "poljane". The buildings were built in the settlements or in the vineyards from stone, logs or hewn structures with buried cellars with thick walls in order to preserve the temperature suitable for wine keeping. At the end of the 19<sup>th</sup> century, Serbian wines participated on Bordeaux exhibition in (1882) - 28 exhibitors with 58 wines (from Krajina 31, Smederevo 9, Niš 5, Župa and

Levač 4, Požarevac 2, Jelička 2, and 1 from Gročka, Jagodina, Venčac and Pocerina). It was recorded that 19 wines were awarded.

The beginning of the 20<sup>th</sup> century was marked by the change of royal dynasties, so after ascending to the Serbian throne, King Petar I Karađorđević (since 1903) began to form an endowment estate in Oplenac. In the same years, the Venčac vineyard cooperative was founded in the village of Banja near Arandjelovac, and after next cooperatives was in Jovac (1908) and Smederevo (1909). During the Balkans and the 1<sup>st</sup> World War, viticulture was in stagnation in all countries, due to a lack of manpower, means of protection, etc. At the time of the Austro-Hungarian occupation, Serbian vineyards were partly neglected and partly ruined, so only after the liberation was the restoration of the plantations begun.

The interest that King Petar I showed for viticulture and winemaking resulted in the creation of a kind of estate that contributed to development of viticulture and winemaking on territory of the newly created Kingdom of Serbia, i.e. later the Kingdom of SHS and the Kingdom of Yugoslavia. King Petar, and then his son King Alexander, intensively participated in increasing of new plantations, procuring planting material from nurseries in Smederevo and cuttings from France (1925). Marković N. et al. (2003) state that by 1935, the total area under vineyards was 37.78,31 ha, of which 4/5 were under wine and 1/5 under table varieties. The following wine varieties were grown: Prokupac, Skadarka, Žilavka, Plovdina, Riesling, Shasla red, Shasla white, Semyon, Sauvignon blanc, Pinot noir, Blatina, Chardonnay, Gamay black, Malaga, Smederevka. Of the table varieties, the most common were Muscat

Hamburg, Shasle and Drenak, and from 1935, table interspecies hybrids ("American vine"). With the establishment of a cellar in Oplenac (1931), the production of Riesling, Žilavka, Oplenka, Plemenka, Malaga, Smederevka, Semyon-Sauvignon blanc, Pinot noir, Gamay black, Shasla, Prokupac, Skadarka and Hhad started again. Also, the production of brandies such as komovica, šljivovica prepečenica, soft šljivovica, klekovača, klekovača extra, cognac novi, liqueurs, topolac (vermouth) was started.

According to the aforementioned characteristics, the king's estate had an experimental-production, as well as a reproductive-educational character. Namely, Oplenac was a nursery of vines of noble varieties, especially those introduced and popular in the viticulture of France, Germany, Italy and other developed viticultural countries of Europe. Between the two world wars, the authorities insisted on the formation of fruit and vine nurseries, which were the carriers of the development of these agricultural branches in the entire kingdom. Also, it was insisted on the continuation of the association system in the so-called "cooperatives", which began with the formation during the time of the Obrenović government (remained to this day as the basis of association in agriculture), and which ensured a new type of association of grape and wine producers and their joint appearance on the domestic and foreign markets. This is how the Knjaževačko wine-farming cooperative was formed (1927), the Negotin vineyard cooperative (1929), etc..The vineyards of this period were mainly characterized by a small distance between the vines, which allowed manual cultivation or the use of cattle carts. The period between the two wars represented a real renaissance of Serbian viticulture and winemaking,

bearing in mind the expansion of vineyard in all wine-growing regions of the time on an area of over 150.000 ha and the construction of numerous smaller and larger wineries with the production of better quality wines thanks to new technological concepts from French and German experts.

During the 2<sup>nd</sup> World War, Serbian vineyards suffered significant damage due to the bad conditions and cultivation in appropriate way.

After the 2<sup>nd</sup> World War, viticulture in Serbia had several stages. The first stage covers period from 1945-1954 and is characterized by an extensive production. The vineyards are still planted by old system with close planting. However, the first VSP planting system are also being planted with an inter-row distance of 2 m. This stage also represents transition from an extensive to a more intensive way of grapevine growing. The second stage, from 1954-1959, is characterized with an inter-row distance of 2–2.5 m and mechanization using. The third stage, from 1959-1970, is characterized with vineyards with an inter-row distance of 2.5 to 4 m. It is the period of planting of intensive vineyards (Avramov L., 1971). This tendency is also connected with more efficient application of mechanization, lower consumption of workers, reduction of production costs, introduction of new varieties, new rootstocks, etc. In the period from the 2<sup>nd</sup> World War until the 70s of the 20<sup>th</sup> century, in accordance with the socio-political system, there was a state and individual (private) sector of grape production. In the 1970s, 106,000 ha belonged to the individual sector, and 10,500 ha to the state sector. The varieties in vineyards of individual (private) sector mainly belonged to groups of varieties for quality and table wines (Limberger,

Prokupac, Začinak, Smederevka, Šasla, Kreaca, Furmint, Ezerjo, Plovdina, Crvena Ružica, Bela Ružica, Slankamenka). A small number of private producers had varieties in their plantations for making of top quality wines.

On the territory of Serbia, were formed large wineries such as "Narodno vinarstvo i podrumarstvo - NAVIP", "Župski Rubin - Kruševac", "Godomin", "Prokupac", "Krajina vino Negotin", "Kosovo vino" and others. In these state wineries, the varieties are mainly used to making high-quality (top) colored and white wines. Vineyards were planted for intensive grape production with varieties such as Pinot noir, Cabernet Franc, Merlot, Gamay Black, Italian Riesling, Rhine Riesling, Semyon, Sauvignon, Traminer, Pinot gris, Muscat Otonel, etc. From the table varieties, the most common were: Julski muscat, Kardinal, Kraljica vinograda, Šasla, Muscat hamburg, Afuz-ali and others. The average percentage ratio of this varieties is: varieties for high-quality wines - 10%, varieties for quality wines - 10%, varieties for ordinary wines - 70%, table varieties - 10%. At that time, Yugoslavia followed a policy of quantity and not quality, and thus became the fifth exporter of wine in the world.

In the individual sector, grape growing technology was mostly extensive with a low trunk formed. On the state farms, a high of trunk was adapted to the growing method. Most often, various cordons were represented, where it was possible to carry out a higher yields. In Serbia, 90% of planting material production (from the total production in SFRY) is of enviable quality and production (about 20 million grafts per year). Most of the produced planting material was exported abroad - the USSR, Romania, Hungary, Bulgaria, the countries of the Arab world, but also the countries of

Western Europe.

In the 80s and 90s of the last century, the stagnation of viticulture and the vineyard area reduction were started. In particular, the stagnation was reflected in the private sector, with the population migration from the countryside to the cities, abandonment of vineyards, growing other plants which are more profitable (growing raspberries, blackberries...). In state sector as well, due to the hyperproduction of grapes, the development of the brewing industry, various companies reorganizations etc., there is a noticeable decrease in the area under vines. Statistics show that from 116.000 ha in 1970, the area under vines has decreased to around 60.000 ha. The disintegration of the SFRY, the wars that followed, sanctions and the international isolation of Serbia, and especially the bombing by NATO and the consequences of the bombing, led to the complete destruction of viticulture as a minor agricultural branch at that time. It is estimated that only about 20.000 ha under vine survived and could be maintained at the beginning of the XXI century. With the change of government, most of the former state companies in Serbia were privatized. Some of those companies kept grape production, while others turned to other types of production. In traditionally wine-growing areas, some areas under vines remained undere same level. The survival of small and large wineries depended on the import of grapes from the surrounding wine-growing countries - mainly North Macedonia, Greece, less Bulgaria.

For the last twenty years, have been made efforts to restore Serbian viticulture. With a more modern approach, it started with the selection of newer clones of varieties mainly for producing of top quality wines, newer methods of planting (mechanized with satellite and laser

guidance), more modern tractors and machines, big density planting intervals, etc. The most common varieties used in new vineyards are: Sauvignon blanc, Chardonnay, Pinot blanc, Cabernet Sauvignon, Merlot, Pinot noir, Cabernet Franc,... . Some varieties were less present such as Syrah (Shiraz, Syrah), Muscat otonel, Muscat petit grain, Marselan (Marselan), Tempranillo, Viogner, Semillon, Pinot gris, Traminac. Table varieties such as Matilda, Prima, Danlas, Ora, Michele Palieri, Victoria, Black Magic and others were also introduced. Autochthonous varieties such as Prokupac, Tamjanika, Bagrina, Smederevka, Crna Tamjanika, Seduša, Skadarka occupy a special place in the new vineyards.... One part in the new vineyards belongs to newly created wine varieties such as Morava, Sila, Petra, Župljanka, Probus, Neoplanta, and table varieties: Krajinski bojadiser, Smederevski muscat, Gročanka, Carmen and others. With the formation of smaller and medium-capacity wineries (from 100,000 to 500,000 bottles per year), the situation of the viticulture and wine sector has changed significantly through the increasing of areas under vines and the improvement of wine quality. Today there are around 360 registered wineries in Serbia.

## CONCLUSION

The period of viticulture development in Serbia from the 19<sup>th</sup> century until today has gone through phases of increasing and decreasing according to economic development, socio-political arrangements and scientific and technological development in the economic branches of viticulture and winemaking industries. From extensive plantations under vines and archaic varieties grown during the 19<sup>th</sup> and first decades of the 20<sup>th</sup> century, we moved

to a slightly more intensive way of growing vines and expanding the areas under this plant between the two world wars. This development period is also characterized by the introduction of varieties with the "*occidentalis*" prefix, which significantly changed the varietal composition and thereby improved the quality of wine for the producers. As a result of such practice, various awards have been won at major world fairs and exhibitions.

The period after the 2<sup>nd</sup> World War include the period from 1945-1954. Years with extensive production methods. The vineyards are still raised in the old way with small distance between plants. However, the first vineyards with trellis method are also being planted with an inter-row distance of 2 m. This stage also represents the transition from an extensive to a more intensive way of growing vines. The second stage, from 1954-1959, is characterized by the planting of vineyards with an inter-row distance of 2–2.5 m, with mechanization using. The third stage, from 1959-1970, is characterized by vineyards with an inter-row distance of 2.5 to 4 m. It is the period of planting intensive vineyards. This tendency is also connected with the more efficient use of mechanization, lower consumption of worker, reduction of production costs, introduction of new assortment, new rootstocks, etc. In the 80s and 90s of the last century, the stagnation of viticulture and the reduction of the area under vines began. In particular, the stagnation was reflected in the private sector, with the migration of the population from the countryside to the cities, the abandonment of vineyards, and the replacement of more profitable crops.

For the last twenty years, efforts have been made to restore Serbian viticulture. With a more modern approach, it started

with the selection of new clones of varieties mainly for obtaining top quality wines, new planting methods (mechanized with satellite and laser guidance), more modern tractors and machines, close planting intervals, etc. Today there are around 360 registered wineries in Serbia.

## ACKNOWLEDGEMENTS

This work was carried out with the support between the Faculty of Agriculture in Belgrade and the Ministry of Education, Science and Technological Development of the Republic of Serbia, contract registration number: 451-03-68/2022-14/200116.

## REFERENCES

Avramov, L. (1991). *Viticulture*. Belgrade.  
Avramov, L., Žunić, D. (2001). *Posebno vinogradarstvo*. Belgrade.  
Blagojević, M. (2004). *Zemljoradnja u srednjovekovnoj Srbiji*. Belgrade.  
Burić, D. (1972). *Viticulture I-II*, Novi Sad, Serbia.  
Winkler, A. J. (1974). *General viticulture*, Berkley – Los Angeles, USA.  
Galet, P. (1976). *Precis de Viticulture*, Montpellier, France.  
Годельман, Я. М. (1990). *Экология молдавского виноградарства*, Кишинев.  
*Добротољубље, I, II, III, IV, V*, 2009 Hilandar Monastery, Athos.  
Dragaš, M. (1961). *Viticulture*. Belgrade.  
Group of authors (1986-1987). *Енциклопедия виноградарства, I, II, III*. Кишинев.  
Jacquemin, G., Alliot, H. (1903). *La Vinification Moderne – oul' Art de faireetco server le Vin*. I, Viticulture, Paris.  
Karadžić, V. (2015). *Опис земље, народа и државе*, Ниш.  
Ковачевић, М. (2016). *Света царска српска лавра Хиландар на Светој*

*Гори Атонској, СЦСЛ Хиландар – Београд*.  
Kuljančić, I. (2007). *Viticulture*. Novi Sad, Serbia.  
Marković, N. (2012). *Технологија гајења винове лозе*, Београд.  
Marković, N. (2019). Из историје светогорског виноградарства, Десета казивања о Светој Гори, Друштво пријатеља Свете Горе Атонске, Задужбина светог манастира Хиландар. pp. 195-228, Београд.  
Marković, N., Pržić, Z., Rakonjac, V., Todić, S., Ranković-Vasić, Z., Matijašević, S., Bešlić, Z. (2017): Ampelographic characterization of *Vitis* cv "Prokupac" clones by multivariate analysis. Romanian Biotechnological Letters, Vol. 22(5): 12868-12875.  
Marković, N., Pržić, Z. (2018): Clonal selection of Prokupac grape variety in Serbia-current results. The 47<sup>th</sup> Conference of the European Society for New Methods in Agriculture-ESNA, procideengs, papers print in Annals of the University of Craiova - Agriculture, Montanology, Cadastre Series, 48(1):146-151.  
Мержаниан, А. С. (1967). *Виноградарство*, Москва.  
Nakalamić, A., Marković, N. (2009). *General viticulture*. Belgrade.  
Негруль, А. (1968). *Виноградарство и виноделие*, Москва.  
Niketić, M. (1935). *Viticulture*. Belgrade.  
Острогорски, Г. (1959). *Историја Византије*, Belgrade.  
Pržić, Z., Marković, N. (2019): Agrobiological and technological characteristics of some grapevine varieties and clones grown in Serbia. The 15th annual meeting "Durable agriculture – agriculture of the future: advanced methods for a sustainable agriculture, silviculture, cadastre and

- food science". 7th-8th November 2019, Craiova, Romania Anals of the University of Craiova – Agriculture, Montanology, Cadastre Series, Book of proceedings Vol. XLIX/2019:229-237.
- Radivojević, D., Marković, N. (2015). *Pomiculture and Viticulture*. Belgrade.
- Riberau-Gayon, J., Peynaud, E. (1971). *Sciences et techniques de la vigne*, Paris.
- Статистика виноградарства у краљевини Србији за 1889. годину*, Државна штампарија краљевине Србије, Belgrade.
- Stojanović, M. (1957). *Viticulture*. Belgrade.
- Ćorović, V. (2001). *Istorija Srba*. Belgrade.
- Fregoni, M. (2005). *Viticultura di Qualita*. Verona, Italy.