

## Conference Paper

# The Institute of Viticulture and Winemaking "Magarach" – to the Viticulture of the Chechen Republic

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## Abstract

In the second half of the last century, the budget-forming industry of the agroindustrial complex of the Checheno-Ingush Republic - viticulture, had great success: in some years, gross grape output reached 100 thousand tons; the total area of vineyards reached 30 thousand hectares; wide sections of the rural population were provided with work in 54 wine-growing farms of 7 administrative districts. Along with the leading role of the state, science, represented by the leading scientific institutions of the country, also provided invaluable assistance in the development of this industry. Among them the former All-Soviet National Research Institute Viticulture and Winemaking "Magarach" (now Federal State Institution of Science "Russian National Research Institute Viticulture and Winemaking "Magarach" RAS") took a worthy place. The article provides material that reveals the role of this institute in solving a number of production issues and problems that arose before the industry in certain periods of time. It is shown that thanks to the close cooperation of scientists and production workers, against the background of a unified state policy, effective solutions were achieved in one or another direction of its development. In particular, it concerns the improvement of the grape assortment, the solution of the phylloxera problem, the production of environmentally friendly products, etc. It is concluded that at present, for the sustainable development of viticulture of the Republic, it is necessary to renew ties with scientists from the Magarach Institute of Viticulture and Winemaking, and in general to strengthen further links between science and production.

**Keywords:** grape varieties, phylloxera, open-earth cultivation, vaccination, sustainability.

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## 1. Introduction

By the mid-80s. XX in the wine-making industry of the Checheno-Ingush Republic achieved great success in its development: in some years, gross grape output reached 100 thousand tons; the total area of vineyards reached 30 thousand hectares; wide sections of the rural population were employed. Science has made a contribution to this process, represented by leading scientific institutions of the country, including the former All-Soviet National Research Institute Viticulture and Winemaking "Magarach"

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(now Federal State Institution of Science "Russian National Research Institute Viticulture and Winemaking "Magarach" RAS").

Considering that the integration of science with production brings positive results, mutually complementing each other, the purpose of this work was: to show with concrete examples about the role of the Institute of Viticulture and Winemaking "Magarach" in solving the problematic issues of viticulture of the former Checheno-Ingush Autonomous Soviet Socialist Republic.

## 2. Methods and Materials

Studies have been carried out by selecting literary sources on a given topic, studying and analyzing them.

## 3. Results

In November 2019, Federal State Institution of Science "Russian National Research Institute Viticulture and Winemaking "Magarach" RAS" (abbreviated as IVAW "Magarach") marked the 190th anniversary of its foundation. On this long historical journey, the institute had its ups and downs; heyday and wilt due to both objective and subjective reasons. Until the infamous anti-alcohol decree by Gorbachev, M.S. and the Dissolution of the Soviet Union, the institute was "All-Soviet" and spread its influence on the development of sectoral science and production in almost all regions of the country's viticulture, including the Checheno-Ingush Republic (now the "Chechen Republic") [1, 2, 8].

The country bought abroad tartaric lime (TL) and grape seed oil, used for strategic purposes.

General Directorate of the Wine Industry *Rosglavvino* instructed the institute to study these issues on the basis of the *Naurisky* winery. During 1970--75 Researchers at the institute (Razuvayev, Belyaev, Ogai) carried out contractual themes, which resulted in the development of an extractor for winemaking -- *B2-VPE*, which was recommended for introduction in wineries of the USSR

At the Chervlensky winery of the Checheningushvino association, in 1972--74, an automated installation for processing wines in the stream (Makarov A.S.) was tested. This gave positive results (acceleration of the processing process up to 9 days, protection from the turbidity of the wine and reduction of the loss of wine materials by 2 times). On the basis of these results, the Ministry of Food Industry of the USSR, represented

by Rosglavvino, also recommended this installation for implementation at the USSR Winemaking enterprises.

In the late 70s, the territory of the republic was in the zone of partial infection with phylloxera. The efforts of scientists and practitioners were aimed at maximally preserving the life of the own-owned vineyards. For this purpose, it was recommended to use isabelous varieties of grapes, and curing infected pest vineyards [7]. However, the plantings of the Isabel varieties have become chlorinated, and the manual has superimposed it to be locked up and used.

There was a question how to deal with phylloxera in the future. The whole world solved this problem by switching to a grafted culture [2, 13--15]. However, the republic belonged to the area of sheltered viticulture, which complicated the solution of the problem.

IVAW "Magarach" came to the rescue. It was during this period that extensive production tests began, conducted by scientists of the institute (Asriev, Chichinadze, Yakushin) to study the effect of a carbon disulfide emulsion, which was introduced into the soil at a depth of root grape propagation by a special fumigator developed by this institute. Positive results were obtained and recommendations for its use were developed [3].

Soon, this method of "healing" of own-vineyards in vineyards infected with phylloxera was widespread. However, later, due to the complexity of production, transportation, the introduction of a carbon disulfide emulsion, and other reasons, this method (like many others) was curtailed.

In the "Druzhba" farm of the Gudermes district, a new formulation of the Magarach Institute was tested, which was named "Magarach-Ilcher" (Ilyin, Chergizov). Despite the obvious benefits, the shaping was not widespread due to the leash that created all sorts of interferences. However, the idea, in consequence, was embodied in one-sided long-sleeve formations (Huseynov), according to which bushes began to be formed on all the vineyards of the republic.

At all times, scientists and practitioners have paid particular attention to improving the grape assortment, both in our country [4--6, 9--12] and abroad [13--20]. The importance of this issue for the Chechen Republic, which is related to the region of sheltered viticulture, was the laboriousness of the most sheltered culture compared to the shelter.

In order to reduce the cost of caring for plantings of grapes, certain work was carried out on the introduction of standard bushes. Winter-hardy grape varieties were introduced from Russian National Research Institute Viticulture and Winemaking named after Potapenko Ya.I. -- Saperavi Northern, Early Purple, Vydvizhenets, Stepnyak and

others. Production tests have shown that these varieties are severely damaged by frost in the winter. It was found that the cause is the presence of Amur grapes in the genes of these varieties, which during the January and February thaw characteristic of this zone, provokes the early way of the plant out from the quiescence, and therefore decreases the resistance of the eyes and tissues to low temperatures.

In addition, these varieties did not possess resistance to phylloxera and were strongly oppressed by the pest. Therefore, their further distribution ceased. Similarly, the tests and varieties of the Armenian selection (Akhtanak, Nrneni, Nerkarat, Burmunk, Megrabuyr, etc.) did not pass. As for the isabel varieties, which not only withstand harsh winter conditions, but also to phylloxera, their low resistance to the content of active forms of lime in the soil, against the background of low quality berries for winemaking, was, as noted above, the reason for the futility of future use. IVAW "Magarach" came to the rescue again. There were obtained valuable varieties and breeding forms that have group resistance to both frost and phylloxera.

Against this background, the production and state farm association "Checheningushvino" concluded an economic agreement with The Institute of Viticulture and Winemaking "Magarach" on a number of topical issues. In particular, thanks to the initiative of the outstanding scientist-breeder Pavel Y. Golodriga and his students -- Leonid P. Troshin and Maria A. Kostik, with the support of the republic by experts (Zarmaev A.A., Yatskova V.M.), a new era has begun in the republic in sorting out high-grade varieties and breeding forms with group resistance (to frost, phylloxera, diseases and pests) of the Institute's selection.

The study of the grape varieties of the IVAW "Magarach" selection allowed us to single out the varieties *Podarok Magarach*, *Danko*, *Rkatsiteli Magarach*, *Spartan Magarach*, for cultivation under uncovered standard crops, and the variety *Aurora Magarach* for semi-burst.

No less important was the phylloxera problem. Grafted vineyards in the conditions of ukryvnoy culture became damaged.

In this regard, interest has increased in grape varieties tolerant to phylloxera, allowing them to preserve their own-rooted culture in conditions of continuous phylloxera infection. At the same time, this circumstance began to dominate over the desire to lead the open-earth cultivation of grapes.

Thanks to the work of Professor P.Ya. Golodriga, the "Magarach" Institute has long been concerned with the problem of breeding resistant varieties, including not only the phylloxera, but also the other stress factors -- biotic and abiotic. The use of such

varieties complied with the principles of adaptive viticulture, the scientific foundations of which we developed.

Our production variety testing in a number of wine-growing farms showed that the grape varieties of the "Magarach" Institute, in particular, meet this requirement: *Avrora*, *Danko*, *Antey Magaracha*, *Pervenets Magaracha*, *Podarok Magaracha*, *Rkatsiteli Magaracha*, *Spartanets*.

With their own root crops, on cohesive soils, these varieties made it possible to produce, depending on the variety, 110--168 c/ha, which was 54--112 c/ha higher than the control variety *Rkatsiteli*, with higher quality indicators.

The study of grape varieties selected by the Institute "Magarach" for resistance to a number of diseases confirmed their advantage. It has been established that in the conditions of the Chechen Republic, high resistance to mildew is manifested in the following varieties: *Spartanets*, *Podarok Magaracha*, *Pervenets Magarach*; to anthracnose - *Danko*, *Pervenets Magaracha*, *Podarok Magaracha*, *Rkatsiteli Magaracha*, a seedling moth -- *Avrora*, *Podarok Magaracha*, *Pervenets Magaracha*, *Spartanets*. The level of profitability of these varieties turned out to be 1.6--2.2 times higher compared to the control variety *Rkatsiteli* due to the reduction of the cost of cultivation on the one hand, and the increase in crop yields on the other.

One of the most important links in the successful cultivation of grapes is an established grape nursery base. Since the beginning of the 80s, the management of the State Committee of the Wine Industry "Goskomvinprom", has become increasingly strenuous to insist on the introduction of a grafted culture in the republic, and with it, and on establishing a base for the production of grafted planting material. Given the lack of experience in this matter, "Chekheningushvino" turned to IAW "Magarach" for help. A relevant agreement was concluded between the parties on assistance in setting up production of planted planting material.

The Institute took an active part in organizing work in this direction. In advanced farms (*Kalianovskiy*, *Naurskiy*, *Soviet Russia*, *Victory*, etc.), under the guidance of the scientists of "Magarach" (Tereshchenko, Dranovskiy, Perfil'yev, Troshin and others), work on the reorganization and adaptation of existing facilities and facilities for the production of vaccinations, stratification and hardening began. At the same time, in 8 farms, they began to select plots for laying 10--15 hectares of queen trees of rootstocks.

Thanks to the scientists of the Institute "Magarach" work moved "off the ground". The training of specialists of the republic began in the subtleties of the production of vaccinations and grafted planting material of grapes, on regular courses Under the vaccination workshops began to adapt the premises in the farms, previously had a

different purpose. In the same year, for the first time in the republic, 100 thousand vaccinations were made at the Kalinovskiy agricultural farm. However, the yield of seedlings was very low and amounted to only 4 %. However, a start was made. Also for the first time, ten hectares of the Vinsovkhoz laid 100 hectares of queen stock rootstock variety Kober 5BB (10 hectares each).

A line for the bandaging of vaccinations, a new way of preparing vaccinations for stratification, developed by the director of "Magarach" Dzheneiev S.Yu. in two wineries (*Naursky* and *Victory*). Producers and specialists of the republic began to acquire skills and experience in the production of grafted saplings and the cultivation of grafted vineyards.

The last order of the Goskomvinprom RSFSR number 218 from 11. 09. 1985 remained on paper. According to this order for 1986--1990, it was necessary to lay 8 thousand hectares of grafted vineyards, build and reconstruct vaccination workshops with a capacity of 9 million vaccinations per season and produce 6 million vaccinations.

However, Mikhail Gorbachev's anti-alcohol decree issued in May 1985 and the subsequent processes of "Perestroika" the country's economy interrupted the dynamic development of the wine-growing and wine-making industry not only in the Chechen Republic, but also in the country.

## 4. Conclusion

For the sustainable development of the wine industry, it is necessary to establish a close link between science and production, including the Ministry of Agriculture of the Chechen Republic and IVAW "Magarach".

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