NATIONAL INTELLECTUAL PROPERTY CENTER OF GEORGIA
SAKPATENTI

Appellations of Origin of Georgian Wine

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SPECIAL EDITION

NATIONAL INTELLECTUAL PROPERTY CENTER OF GEORGIA
SAKPATENTI

Appellations of Origin of Georgian Wine

TBILISI
2010

GEORGIA


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PREFACE

In Georgia, a country with rich culture of wine-growing and wine-making, the tradition of using the geographical name of the place of origin as the appellation of a wine has a long history. Although the territory of Georgia is not large, the number of these appellations is nevertheless significant. Each of them is distinguished by special characteristics, high quality and reputation, which is influenced by the unique environmental conditions of Georgia.

After the entry into force of the legal framework governing the protection of appellations of origin of wines, 18 appellations of origin of Georgian wines have been registered at National Intellectual Property Center of Georgia "Sakpatenti". The Law of Georgia "On Appellations of Origin and Geographical Indications of Goods" defines the concept of appellation of origin and geographical indication and stipulates:

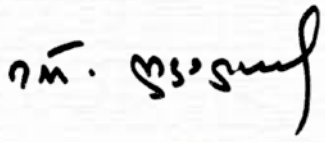
1. *An appellation of origin is a modern or historical name of a geographical place, region or, in exceptional cases, a name of a country (hereinafter "geographical area"), used to designate the goods:*
   - *(a) originating within the given geographical area;*
   - *(b) the specific quality and features of which are essentially or exclusively due to a particular geographical environment and human factors;*
   - *(c) production, processing and preparation of which take place within the geographical area.*
2. *Geographical indication is the name or any other sign, which indicates a geographical area and is used to designate the goods:*
   - *(a) originating in that geographical area;*
   - *(b) specific quality, reputation, or other characteristics of which are attributable to that geographical area;*
   - *(c) production or processing or preparation of which takes place in the geographical area.*

The illicit use of Georgian geographical indications frequently takes place in Eastern European countries. Consumers, misled as a result of illegal actions of counterfeiters, purchase low-quality and imitated products instead of the goods having special quality and features. In addition, producers suffer considerable damages due to the ruined reputation of their goods. Therefore, it is of utmost importance for Georgia to conclude bilateral agreements on protection of geographical indications with other countries.

The Agreement between the European Union and Georgia on the Protection of Geographical Indications of Agricultural Products and Foodstuffs has been initiated. It is envisaged to enter into force in 2011. The Agreement allows use of geographical indications only to those entrepreneurs who produce agricultural and other related products in the designated territories of the EU and Georgia. On the basis of the Agreement, parties refuse to register trademarks that are granted a status of geographical indication according to the Agreement. As provided by the Agreement, Georgian side will continue working towards extending the legal protection to the number of other geographical indications.

In order to take lawful measures directed at remedying the irregularities it is recommended to inform Sakpatenti about the identified cases of illicit use of Georgian geographical indications.

Irakli Ghvaladze
SAKPATENTI CHAIRMAN



Tbilisi, September, 2010

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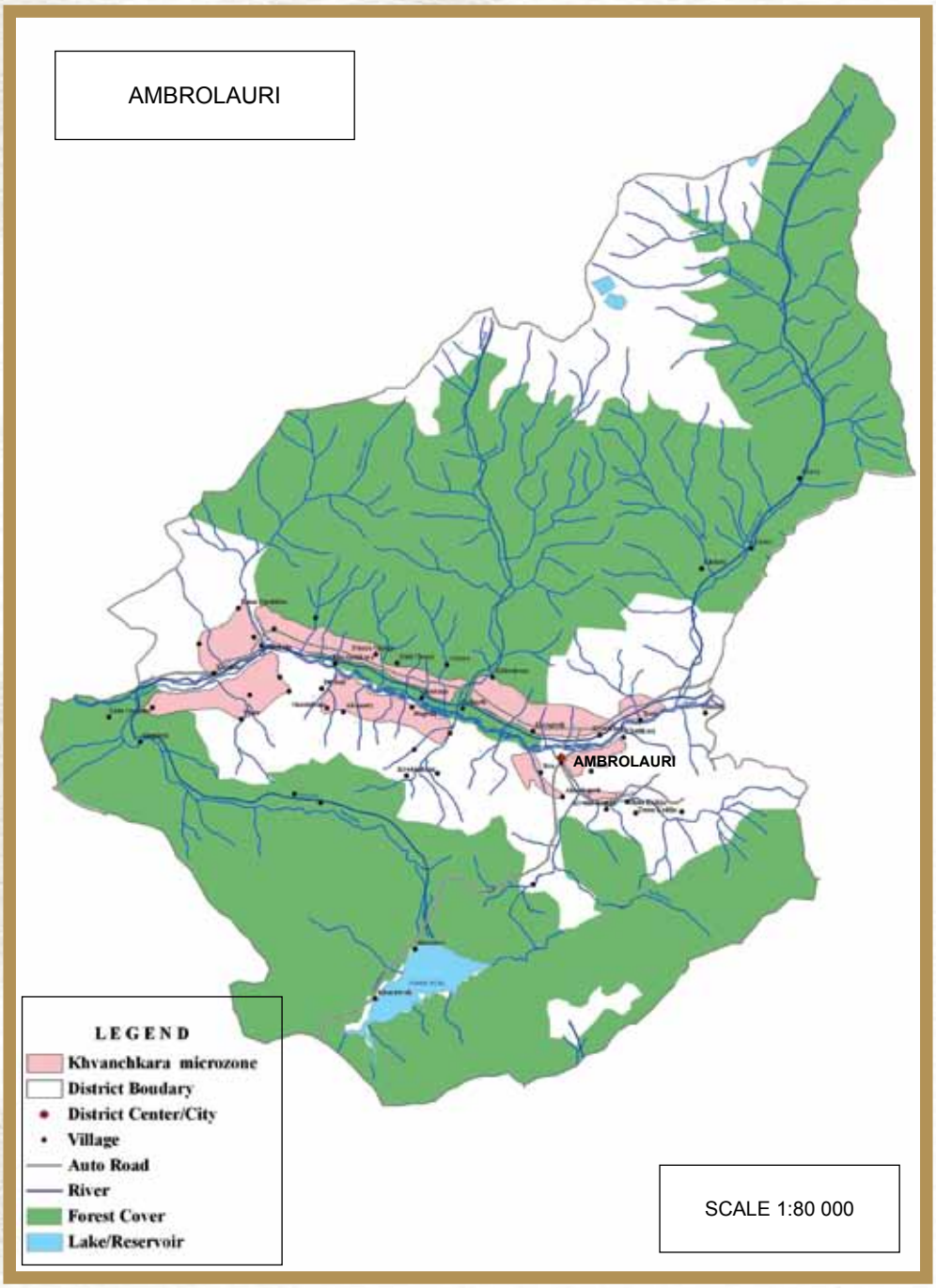
REG. №1 (14.07.2005)


AMBROLAURI
AMBROLAURI
LEGEND
Khvanchkara microzone
District Boudary
District Center/City
Village
Auto Road
River
Forest Cover
Lake/Reservoir
SCALE 1:80 000

Appellation of Origin of "Khvanchkara" Wine

GEOGRAPHICAL LOCATION

The micro-zone of Khvanchkara is located in Racha, administrative Region of Ambrolauri, on the Southern slopes of Lechkhumi Ridge, on the sloped between the coordinates of the Northern latitude of 42°30' and the Eastern longitude of 43°00'. Industrial vineyards are mainly located at 450-750 m above the sea level. The micro-zone spreads along the latitudinal gorge on the right bank of the river Rioni, along 35-40 km, in the pit protected by high ridges. The vineyards are spread on the left bank of the river Rioni, on the northern slope of Racha Ridge.

The micro-zone of the wine Khvanchkara includes the villages located in near the village of Khvanchkara: Tsesi, Kvatskhuti, Sadmeli, Gviara, Bostana, Didi Chorjo, Patara Chorjo, Meore Tola, Pirveli Tola, Chrebalo, Chkvishi, Zhoshkha, Kvishari, Gvardia, Bareuli, Gadishi, Baji, Bugeuli, Saketsia, Jvarisa, Itsa, Krikhi, Akhalsopeli, Gori, Khimshi, Abanoeti. In some years, bulk wine of "Khvanchkara" may be produced in the villages of Tsageri Region – Alpana and Orbeli.

CLIMATE

The weather in the micro-zone of Khvanchkara is formed by the atmospheric processes developed in subtropical and moderate latitudes and moving from the West to the East. The climate here is quite damp, with relatively dry hot summer and moderately cold winter.

Production of originally semi-sweet wine Khvanchkara is possible due to the principal agro-climatic indicators developed on the foothills of the Southern inclination of latitudinal direction: solar energy, amount of heat, moderate tension of summer temperature and moderate humidification of the site.

Average annual air temperature is 12,2-10,8°C, with 21-22°C in July and August, the hottest months of the year, and 0 – -1°C in the coldest month of January. The average of annual absolute minimums is -14 – -16°C, and the average of annual absolute maximums is -36-37°C. Extreme temperatures are -27°C and +40°C.

The annual duration of sunshine is 1900-2000 hours, with over 1400 hours during the vegetation period. The total radiation is quite high and amounts to 120-130 kcal/cm^2 a year.

According to the general cloudiness, the number of clear days, in comparison with other Western Georgian vine-growing regions, is considerably high what together with other factors has a significant influence on the grape quality.

The first autumn night frosts start in the first decade of November, and the last night frosts in spring end in the first decade of April (5.IV-7.IV). The period with no frost lasts for over 215 days. Once in every 10 years, the late night frosts may last until the end of April endangering the early blossomed vine buds.

Buds of Aleksandrouli and Mujuretuli blossome in the middle of April (15.

IV), flowere in the first decade of June, and the grape ripens from the end of the second decade of August.

The grape is technically ripe at the end of September (from 25.IX), and for gaining naturally semi-sweet bulk wine the grape is harvested in the second half of October what needs the sum of active heat of over 3500°C.

In the micro-zone of Khvanchkara, at the height of 450-650 m, the sum of active temperatures (Σt >10°) varies within the limits of 3750-3350°C. At the height of 600 m, the bulk wine of Khvanchkara may be produced once in two years (50%). In other years, dry table vintage wine is produce. The areas at the height of 500 m the sae bulk wine is produced 6 times and 8 times at the height of up to 400 m (75%).

In the zones located above 600 m of height, the bulk wine Khvanchkara may be produced in less cases, and namely, at the height of 650-700 m, it is produced once in every 10 years, and bulk wine for quality table wine is produced in other years.

Following the analysis of the differences (sugar content and acidity) of qualitative characteristics of Aleksandrouli and Mujuretuli, the sugar-content of Aleksandrouli is 0,8-1,3% (i.e. ≈ 1%) less an the general acidity is 0,9 gr/dm^3 (i.e. ≈ 1 g/dm^3) more than the same indicators of Mujuretuli.

Annual sum of atmospheric precipitations in the micro-zone is 1050-1100 mm. The distribution of precipitations in various months is almost equal. The amount of precipitations during the vegetation period is 640-660 mm. On the background of moderate humidification of the warm period of the year, in some years, evaporation excess makes the time period from the moment of flowering ends up to the moment start of ripening dry.

The annual number of days with hail during the vegetation period is 1-2. May and June have most days with hail (0,6-0,8 days each).

Average annual relative air humidity is 75-76%. Air imbibition is the least (68-70%) the second half of summer and is the most (81-84%) in winter. The snow cover appears in the middle of winter and melts until the second half of March. Average height of the snow cover is 15-20 cm.

Rumba winds of Eastern (39%) and Western (37%) directions prevail along the Rioni gorge. Because the gorge is closed, the wind speed is not high. In some micro-districts (Ambrolauri), the wind speed is amplified by the winds of mountains and gorges. As a result, the speed of winds in Ambrolauri and other river-side plains is significantly increases reaching 2,0-2,5 m/sec. The wind becomes relatively stronger during the period of spring and summer (2,5-3,1 m/sec).

SOILS

The vineyards and areas designated as vineyards to produce the bulk wine Khvanchkara are mainly located on the right side of the river Rioni, on the territories of Kvemo Racha and Ambrolauri.

The soil specialists of the Scientific-Research Institute of horticulture, vine-growing and wine-making of Georgia, in the months of June and July of 2005, carried out field and cameral works of soils in the above-listed villages.

Soil analyses were also conducted at the agro-chemical laboratory of the same

Institute.

The study was carried out on both sides of the river Rioni, at the altitude of 450-750 m above the sea level and the following soil types were identified: three varieties of humic-calcareous, one variety of black soil, one variety of dealluvial-proalluvial soil and one variety of alluvial soil – total six varieties.

The soil of the first variety (humic-calcareous, of great thickness, heavy loamy and light clay) is characterized by the following soil sections: village of Khvanchkara, plot Satsavi, 510 m above the sea level and beside the plot Fermis Gverdit (Beside the farm), 750 m above sea level, section №23; village of Sadmeli, plot Kovelebi, 750 m above the sea level, section №14 and plot Sulmukha, 540 m above the sea level, section №16; village I Tola, plot Bereuli, 640 m above the sea level, section №20; village Chkvishi, plot Kavrushi, 615 m above the sea level, section №34 and plot Surguladzis Kari, 595 m above the sea level, section №36.

The soil of second variety (humus-calcareous, of great thickness, skeletal, average clay and heavy loamy soil) is characterized by: village Kvaskhuti, plot Gurgvala, 620 m above the sea level, section №7; village Saketsia, plot At Jvarisi turning, 575 m above the sea level, section №40; village Bugeuli, plot Maedani, 720 m above the sea level, section №43; village Abanoeti, plot Kapianeuli, 680 m above the sea level, section №46; village Gori, plot Muruzaulebi, 655 m above the sea level, section №42.

The soil of third variety (humus-calcareous, of average thickness, average and light clay) is characterized by: village Chrebalo, plot Kavrushi, 750 m above the sea level, section №32.

The soil of the fourth variety is characterized by: village Tsesi, plot Gverda, 640 m above the sea level, section №1; village Bostana, plot Napudzvari, 700 m above the sea level, section №28; village Chorjo, plot Karieti, 695 m above the sea level, section №30; village Baji, plot Khvarakeuli, 500 m above the sea level, section №39; village Ina, plot Getsadzeebis Venakhi (The Getsadzes' vineyard), 640 m above the sea level, section №49.

The soil of the fifth variety (dealluvial-proalluvial, of great thickness, skeletal here and there, light clay) is characterized by: village Bugeuli, plot Chala (Groove), 540 m above the sea level, section №18; village Khimshi, plot Didkana, 575 m above the sea level, section №10; village Dzirageuli, plot Jishta Gamocdis Nakveti (Species examination plot), 540 m above the sea level, section №12; village Gori, plot Muruzaulebi, 655 m above the sea level, section №42.

The soil of the sixth variety (alluvial, of great thickness, weakly skeletal and stony here and there, loamy) is spread in the village of Tsesi, plot Kotes Chala (Kote's groove), 550 m above the sea level, section №4.

For gaining the bulk wine Khvanchkara, according to soil-climatic and relief factors, the territories of Khvanchkara, Didi and Patara Chorjo, Bostana, Gviara, Sadmeli, Zirageuli, Kvatskhuti, I and II Tola on the right bank of the river Rioni, territory of Chrebalo in Kavruli and the territory of the village of Bugeuli on the left bank of the river Rioni (at 750 m above sea level) are special locations.

The existing vineyards with mixed plantations of Aleksandrouli, Mujuretuli, Tsulukidze Tetra, Saperavi, Dzvelshavi, Tsolikouri and other vine species now covers 900 hectares, with 90-100 hectares to be planted in perspective.

In case proper agro-technical and fertilization measures are undertaken the given soils are capable of producing high-quality production.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the wine of appellation "Khvanchkara", the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF ALEKSANDROULI

Growing area: Up to 450-750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,25 x 1,5 m
Height of stem: 60-80 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-8 buds; 70-80 thousand buds per hectare
Harvest: 6-6,5 tons per hectare.

SPECIES OF MUJURETULI

Plot of planting: 2,0 x 1,5 m; 2,25 x 1,5 m
Height of stem: 60-80 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-8 buds; 70-80 thousand buds per hectare
Harvest: 6,5-7 tons per hectare.

SOIL CULTIVATION

In dry land – anti-erosive measures to be undertaken on the slopes of average and great inclination: minimal and zero soil cultivation; grass-lawn system, soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, anthracnose.
Pests: Ticks, the Western grape warm, mealybug.
Pest and disease control measures: Proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF ALEKSANDROULI AND MUJURETULI

ALEKSANDROULI

Georgian red vine species giving high-quality product, of an average ripening period. It ripens at the end of September. The bunch weighs 90-100 gr.

The vine is of average growth. The harvest is 6-6,5 tons per hectare. The sugar-content of the grape reaches 260 gr/dm^3.

It is less resistant to fungous diseases. It is particularly vulnerable to powdery mildew.

MUJURETULI

Georgian red vine species, of later than average ripening period. It ripens in the middle of October. The vine is of average grow, with the harvest of 6-8 tons per hectare. Average weight of the bunch is 60-90 gr. The sugar-content is 250 gr/dm^3, and the acidity is 6-7 g/dm^3. It is less resistant to fungous diseases.

WINE KHVANCHKARA

Controlled premium-quality, red naturally semi-sweet wine of appellation of origin. It is produced with the vine species of Aleksandrouli and Mujuretuli.

Wine Khvanchkara is characterized with dark ruby colour; it has harmonious, velvet, elaborate taste with pleasant sweetness, fruit tones and species-specific aroma.

Chemical properties of the wine Khvanchkara should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass sugar concentration of no more than 30-50 gr/dm^3

Titrated acidity – 5-7 gr/dm^3

Volatile acids of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE KHVANCHKARA

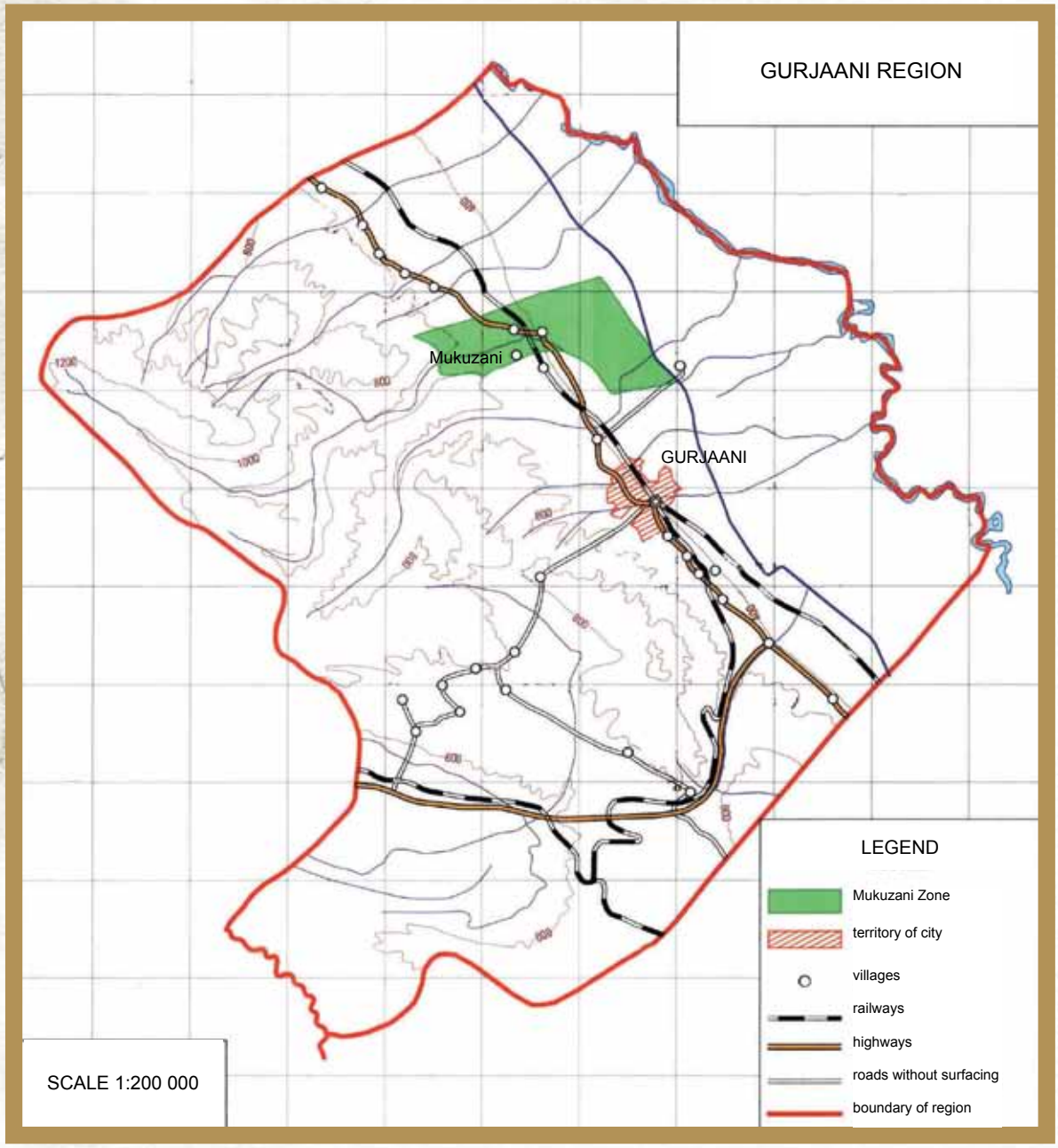
The area for the raw material of the specific zone of wine Khvanchkara is approximately 903 ha, with the species of Aleksandrouli and Mujuretuli occupying 40%, or 360 ha.

The produced harvest in the micro-zone will be 2520 tons on average. In case of output of 65 decalitres of 1 ton 163 000 decalitres of bulk wine may be produced.

Special geographical location of the micro-zone of Khvanchkara in the pit, the microclimate developed on the slopes inclined to the river Rioni, skeletal soils rich in humic-quartz and limestone, good capability of heat absorption and cooling, originality of the species of Aleksandrouli and Mujuretuli and original technology make for peculiar properties of wine Khvanchkara.

Mukuzani

REG. №2 (30.08.2005)


GURJAANI REGION
Mukuzani
GURJAANI
LEGEND
Mukuzani Zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Mukuzani" Wine

GEOGRAPHICAL LOCATION

Micro-zone of Mukuzani is located in Inner Kakheti, the Eastern Georgia, on the right bank of the latitudinal gorge of the river Alazani of Gurjaani Region, on the North-eastern slope of Tsiv-Gombori Ridge, with the coordinates of the Northern latitude of 41°48' and the Eastern longitude of 45°44', at 350-750 m above sea level. The raw material base includes the whole territories of Dedoplis Zvari, Papris Mindvrebi, Damarchine, Nadarbazevi, village of Zegaani, Mukuzani, and a part of Chumlaki, Velistsikhe and Vazisubani. The relief of the area is represented by slightly inclined slopes, plains and aprons.

CLIMATE

The weather in the micro-zone is formed by atmospheric processes developed in subtropical and moderate latitudes and displaced from the West to the East. The processes taking place under the influence of the relief of the location are also of great significance. Those processes mainly include the cold air masses blowing from high peaks of the Caucasioni glaciers of Kakheti. The climate is moderately damp here, with hot summer and moderately cold winter.

The horizon on the area selected for vineyards is well-extended from the East to the West. During the periods of formation (June, July and first half of August) and ripening of the grape seeds in the micro-zone, the sun altitude from the horizon for Mukuzani latitude is 70-60°, and 50-40° what creates an efficient radiation regime for the vine on the slopes slightly inclined North-eastwards.

During the periods of formation and ripening of the grape seeds in the micro-zone, the clearness of the dome of the sky is 16 and 8 days, respectively. The number of cloudy days during the periods when the lower tiers are cloudy is at most 30 and 15 days.

The annual duration of sunshine in vine-growing and wine-making micro-zone of Mukuzani is 2150-2200 hours, with 1600 hours during the vegetation period. Total solar radiation in the micro-zone of Mukuzani is no more than 130 kcal/cm^2, and it is 95-100 kcal/cm^2 during the vegetation period. Sum of direct annual radiation is 75 kcal/cm^2, and the dissipated radiation is 54 kcal/cm^2.

In the micro-zone, the average annual temperature at the surface of humus-calcareous soil is 15°C, in the warmest months (July-August) it is 30°C and it is 0-3°C in winter months. The average maximum in the warmest months is 53°C, and the average minimum in the coldest months is -5°C.

Following the analysis of temperature isopleths of the depth of the soil, at the depth of 5-50 cm, a stable transition of temperature above 10°C takes place in the first decade of April, and at higher depths of 50-100 cm, it does not take place until the middle of April.

Activation of the root system starts in the middle of May when temperature in the soil layer of 10-120 cm depth rises over 15°C. From the middle of June until the end of September, or for over three months, the temperature in the soil layers of the depth of 70 cm is over 20°C, and the temperature of soil at the depth of about 40 cm reaches 24°C from the middle of July to the end of August.

In the micro-zone the average annual air temperature is 12,5°C. The warmest months are July and August, with their average temperature of 23,6°C; the average temperature of the

coldest month (January) is +1,1°C. Following the many-year data, the average of the annual absolute minimums of air temperature is -10 – -11°C, and the average of the annual absolute maximums is 35°C. Extreme temperatures are -23°C and +38°C.

The buds of Saperavi blossom in the middle of April, and flower at the end of May. The grape ripens in the second half of August. The technical ripening of grape takes place at the end of September. This needs active heat of 3500°C and more, which in Mukuzani micro-zone accumulates at the altitude of about 700 m.

The sum of active temperatures (Σt>10°) at the altitude of 350-750 m in Mukuzani vine-growing micro-zone is 4120-3440°C. The premium-quality table bulk wine of an European type will be produced from Saperavi (with sugar content of >21% and titrated acidity of 6,0-7,5 gr/dm^3) at the amount of heat of 4000°C. This amount of heat is accumulated in the micro-zone only at the height of 420 m (50%). Such a product may be produced from the areas at 500 m height once in every four years (25%).

The probability of the years with the premium-quality production at the height of 600 m is no more than 5% (five times in every 100 years), and the probability of producing good-quality product is 25% (once in every 4 years). The areas above 600 m produce relatively inferior wine proper for local use only.

The areas located at the heights of 350-450 meters can produce naturally semi-sweet bulk wine of Saperavi five times in every 10 years and once in every 4 years, respectively.

Annual sum of atmospheric precipitations in Mukuzani micro-zone is 870 mm, with 645 mm in the vegetation period. The amount of precipitations during the fruit formation period (VI-VII-VIII) is 253 mm. The sum of moisture deficit in the ground-edged air layer is 765 mm (Gurjaani). The mentioned indicators mean that the moisture-content in the given micro-zone is not sufficient (0,33) for a vine, and therefore, during the given period, vine needs irrigation (w=0,4 x 765 – 253 = 306 – 253 = +53 = 530 m^3/ha, i.e. 560 m^3/ha) water is needed per hectare. The period of grape ripening is moderately humid (0,59) and the vine needs no irrigation.

Average relative humidity of air is 71%. Air imbibition is the least in July and equals to 63% and in August equalling to 60%. This indicator is relatively higher at the end of autumn (78%) and in winter (76-75%).

Snow cover appears in the last decade of December (from 25.XII) and melts in the middle of March. In 74% of years, snow cover is not stable. The number of snowy days in winter is 26.

The annual number of days with hail is 2,1 on average. The months of May (0,7 days) and June (0,5 days) have most days with hail.

The average of the annual absolute minimums of the air temperature is -9 – -11°C. Once in every 10 years, minimum temperature of -15°C with little duration is expected what will only slightly damage the vine buds (<30%).

Rumba winds of Western (32%) and South-western (23%) directions prevail in the micro-zone. The number of days without wind is about 21% per annum. At night, before the sunrise, the cold air masses flowing down the high tops of the Caucasioni Mountains intensify the danger of winter frosts and spring night frosts. Generally, the micro-zone belongs to the third group of wind adverse activity. Average annual wind speed is 1,4 m/sec. Wind speed in different months is almost the same. The number of days with strong wind is only 4 per annum. In the best instance, two-row windbreaks are recommended.

The first autumn night frosts usually start at the end of November (27.XI). Once in every 10 years, the first frosts may take place earlier, from November (26.X) what does not endanger vine. The last frosts usually end in March (24.III). Once in every 10 years, the

frosts may end in the middle of April. In such a case, if buds blossom earlier than usual (at the end of March or at the beginning of April) as it happened in spring of 2004, the night frosts are very dangerous. The period without frost lasts over 230 days.

SOIL

In June and July of 2005, the soil specialists from the Scientific-research Institute of horticulture, vine-growing and wine-making, of Georgia aiming at studying the soil cover of the micro-zone, conducted field and cameral works to the soils on the above-mentioned territories. Analytical works of soils were conducted at the agro-chemical laboratory of the same Institute.

There are different types and varieties spread on the studied territory:

1. Brown, weakly skeletal, clay and loamy soil of great thickness;
2. Dark brown(old alluvial), clay of great thickness;
3. Dark brown, weakly skeletal, average and light clay of average thickness;
4. Rendzina-brown, weakly skeletal, light clay and heavy loamy soil of great thickness;
5. Rendzina-brown, weakly skeletal, clay and loamy soil of average thicknes;
6. Brown forest, weakly skeletal and stony, heavy loamy soil of great thickness.

Brown soils of great and average thickness are spread on most of the territory. Depth of profile in the soils of great thickness is from 80-100 cm to 110-130 cm, and the same indicator in the soils of average thickness is from 60-70 cm to 70-80 cm. The thickness of humus-containing active layer in the soils of great thickness is from 50-60 cm to 75-85 cm and from 30-40 cm to 40-50 cm in the soils of average thickness. The texture of the soils is loamy and light lumpy in the lower layers. Roots, organic remains, limestone pebbles are met in the soil profile. The content of calcium carbonates increase from up downwards and amounts to 24% in the lower layers. The lower layers of some sections (Rendzina brown) contain calcium carbonates in extremely great amounts of up to 64%.

The content of humus is little in every soil. The contents of hydrolysis nitrogen, soluble phosphorus and exchange potassium are mostly low. The reaction of soil area (pH) is average alkaline.

The studied soil cover is spread on the inclined forms of the relief and the soils are developed on high-calcareous rocks. All the mentioned factors, together with the exposition, illumination and climatic conditions allow producing high-quality bulk wine Mukuzani.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of appellation Mukuzani, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF SAPERAVI

Growing area: Up to 350-600 m above sea level

Plot of planting: 2,5 x 1,5 m; 2,0 x 1,5 m; 3,0 x 1,5 m

Height of stem: 70-90 cm

Form of pruning: Free and Georgian two-sided trellis

Norm of loading per 1 sq. m.: 8-10 buds; 80-100 thousand buds per hectare

Harvest: 7-8 tons per hectare

Urgent agricultural measure: Sorting of high-yielding tillers in accordance with the established agricultural regulations to gain regulated harvest. Tearing off the tiller tips 2 or 3 days before flowering.

SOIL CULTIVATION

Autumn and Spring ploughs of soil. Minimum soils cultivation. Moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching). The last vegetation irrigation in the irrigation area should be ended one month before the vintage.

In dry land – preservation of soil surface free of weeds and in a loose state; minimal and zero soil cultivation; soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, anthracnose, rots.

Pests: Ticks, the Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF SAPERAVI

Saperavi, by its economic designation is red-grape wine species. It produces invaluable material for almost every type of wine. The vine is stronger than average grow. The average harvest per hectare is 7-8 tons. The weight of a bunch is 140–145 gr. on average. Sugar content of the ripe grape reaches 260 gr/dm^3, with the acidity of 7,5–8,5 gr/dm^3. The bunch weighs 140-145 gr. on average. It is characterized by fall of flowers. It is not sensitive to fungus diseases.

WINE MUKUZANI

Mukuzani – Controlled high-quality, red dry wine of appellation of origin. It is characterized by pomegranate colour, with full, harmonious, velvet and elaborate taste, well-defined species-specific aroma and race, high-extractability.

Chemical properties of the wine Mukuzani should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Mass concentration of sugars of no more than 3 gr/dm^3

Titrated acidity – 5,0-7,5 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 160 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE MUKUZANI

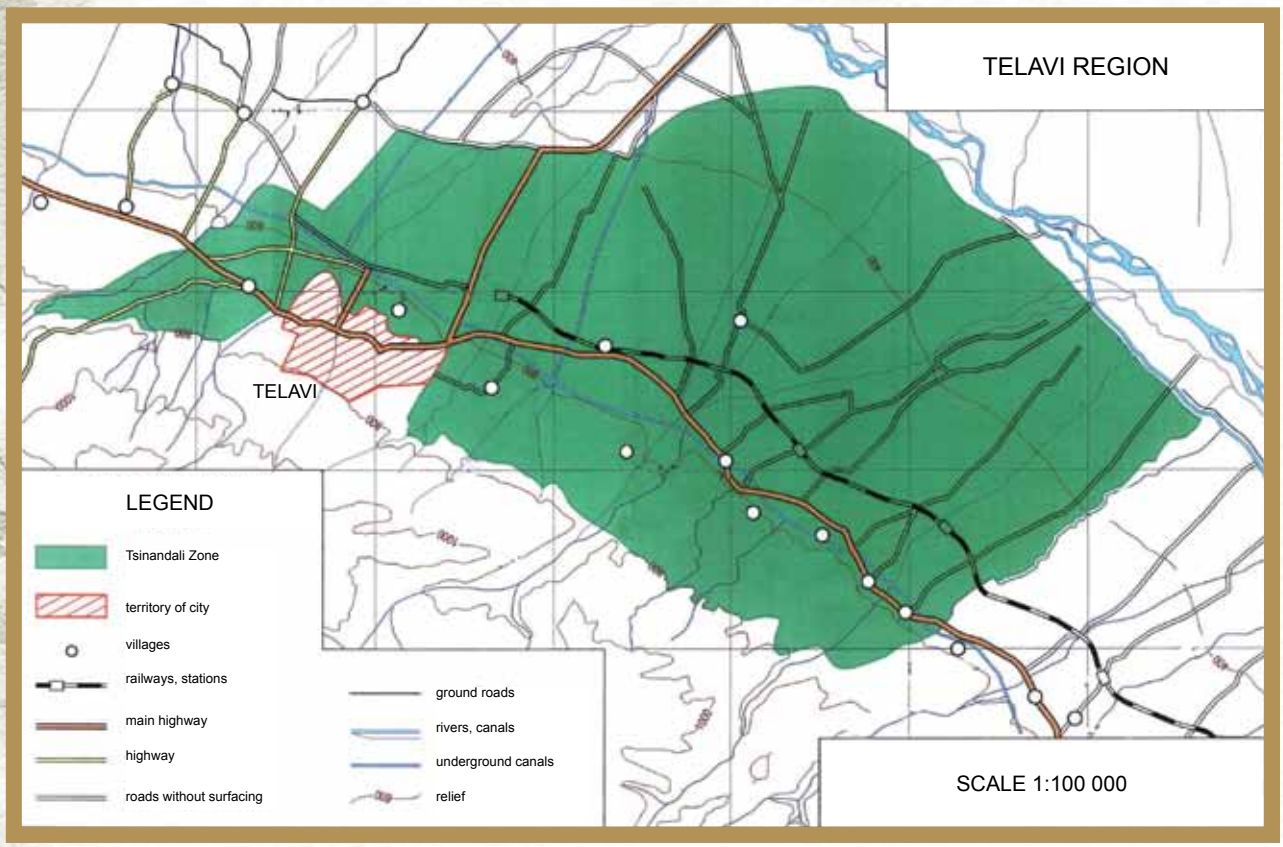
The areas for raw material in the micro-zone of the wine Mukuzani is approximately 246 ha.

The expected volume of conditional harvest is approximately 1600 tons. At the output of 65 decalitres out of 1 ton, 104 000 decalitres of bulk wine may be produced.

The geographical exposition of the micro-zone of Mukuzani, the North-eastern inclination of Tsiv-Gombori Ridge, microclimate developed trough cold air masses descending the peaks covered with the Caucasioni glaciers, calcareous and loessial soil clays, skeletal-alluvial deposits, ecological plasticity of the species Saperavi make for peculiar values of wine Mukuzani.

Tsinandali

REG. №3 (30.08.2005)


TELAVI REGION
TELAVI
LEGEND
Tsinandali Zone
territory of city
villages
railways, stations
main highway
highway
roads without surfacing
ground roads
rivers, canals
underground canals
relief
SCALE 1:100 000

Appellation of Origin of "Tsinandali" Wine

GEOGRAPHICAL LOCATION

The micro-zone of wine Tsinandali is located on the right bank of the river Alazani, in the administrative region of Telavi, with the coordinates of the Northern latitude of 41°54' and the Eastern longitude of 45°35'. The territory of Tsinandali covers the extensions of woody slopes of the Northern-Eastern inclinations of Tsiv-Gombori mountains on the one hand, and foothills and Alazani plain, on the other hand. Industrial vineyards are mainly located at 300-750 m above sea level.

The micro-zone of wine Tsinandali includes the following villages: Akura, Vanta, Busheti, Kvemo Khodasheni, Tsinandali, Kisiskhevi, Kondoli, Nasamkhrali, Shalauri, Kurdgelauri, Vardisubani.

CLIMATE

The climate is moderately humid with hot summer and moderately cold winter. The annual duration of sunshine is more than 2300 hours. The sum of the solar direct radiation on perpendicular surface is 130 kcal/cm^2, and that on the surface horizontal to the sunrays is 76 kcal/cm^2. During the warm period, this indicator is 92 and 60 kcal/cm^2, respectively. Dissipated radiation per annum is 54 kcal/cm^2, and the same in the vegetation period is 40 kcal/cm^2. The annual value of total radiation is 130 kcal/cm^2, and 100 kcal/cm^2 in the warm period.

The average annual air temperature is quite high reaching 12,4°C. The warmest month are July and August, with their average temperature of 23,2°C; the average temperature of the coldest month (January) is +0,9°. Average of the annual absolute minimums is -10°C, and the average of the annual absolute maximums is 35°C. Extreme temperatures are -23°C and +38°C.

In most part of the region a stable transition of the air temperature above 10°C is in the first decade of the month of April (8.IV) and the temperature falls below 10°C in the first days of the month of November (from 3.XI). The duration of the vegetation period is 208 days. Total of active temperatures ($\Sigma t>10°$) is 3800°C at the height of 550 m.

The annual number of clear days (0-2 points), according to the general and lower tier cloudiness, is 52 and 82. During the vegetation period, this indicator according to the mentioned levels of cloudiness equals to 36 and 55 days, respectively.

The annual indicator of the cloudy days (8-10 points) is 122 and 95, according to the general and lower tier cloudiness, is 122 and 95, respectively, and that during the vegetation period is 61 and 45, respectively.

The annual sum of atmospheric precipitations is 845 mm, with 644 mm during the vegetation period. Maximum out of annual precipitation is fixed in May (157 mm),

and minimum is fixed in January (28 mm).

The vine buds (of Rkatsiteli, Saperavi, Cabernet) start blossoming in the middle of April ripening from the middle of August. Grape should be harvested at the end of September if high-quality vintage wine of European quality is to be produced.

Total of active temperatures in Tsinandali micro-zone (at the altitude of 300-750 m) varies within the limits of 4100-3500°C. High-quality bulk table wine of an European type may be produced from the vine species growing here in 75-35% (from the land plots with the altitude of 300-450 m), or sever or four times in every 10 years. Production of good quality is gained in the given areas almost every year.

At the altitude of 500-550 m, the high-quality bulk wine is produced twice in 10 years (20%) whereas the product of good quality may be gained 5 times in 10 years (50%). The product of good quality may be gained from the plots at the altitudeof 600-650 m twice in 10 years (20%).

Days with hail in Tsinandali are frequent (2,3 days per annum, on average). Most frequently it hails in May and June (0,7 and 0,8). It may hail 9 times in the years with extremely high proportion of hail.

Average relative air humidity is 70%. The air imbibition is the least in August (60%), and is the greatest in November (77%).

Rumba winds of the Western (35%) and the Eastern (23%) directions prevail in the micro-zone. The average annual wind speed is 1,7 m/sec. The number of days with strong winds in the year is not high (10 days).

According to multi-year data, the average of the annual absolute minimums of the air temperature is -10 – -11°C. Once in every 10 years, minimum temperature of -15°C with little duration is expected what will only slightly damage the vine buds (<30%).

SOIL

In June and July of 2005, the specialists of soils from the Scientific-Research Institute of horticulture, vine-making and wine-making, aiming at studying the soil cover in the micro-zone, performed field and cameral soil works in the study area. The analytical works of the soils were conducted at the agro-chemical laboratory of the same Institute.

The following types of soils were identified on the study territory:

1. Brown forest, of great thickness, average and strongly skeletal, heavy loamy;
2. Brown, of great thickness average, weakly skeletal here and there, clay and loamy;
3. Brown, of average thickness average, weakly skeletal, heavy loamy;
4. Brown meadow, of great thickness, heavy loamy and clay;
5. Brown meadow, of great thickness, weakly and average skeletal, loamy;
6. Dealluvial-proalluvial, of great thickness, light and heavy loamy;
7. Dealluvial-proalluvial, of great thickness, weakly skeletal, loamy;
8. Alluvial, of great thickness, heavy loamy;
9. Alluvial, of great thickness, strongly skeletal, loamy.

The soil of the first variety is characterized by the model soils in the villages of Vanta, Akuri (plot Sites of ancient settlements), Kisiskhevi (plot of Above the channel).

The soil of the second variety is characterized by the model soils in the villages of Busheti (plot At the White Bridge, below the railway, Shalauri (plot Below the highway), Vachnadziani (plot Khramitsebi).

The soil of the third variety is characterized by the model soils in the village of Shalauri (plot Sites of great asp).

The soil of the fourth variety is characterized by the model soils in the villages of Tsinandali (plot Teliani), Kvemo Khodasheni (plot Naparekhlebi), Kurdgelauri (plot Beganapshebi).

The soil of the fifth variety is characterized by the model soils in the village of Khodasheni (plot Great vineyards).

The soils of the sixth and seventh varieties are spread in the transition zone of the above-listed villages into Alazani plain.

The soils of the eighth and ninth varieties are located directly at the limit of the Alazani terrace.

Brown soils spread in the upper part of the micro-zone are characterized by average and deep profiles (by their varieties). Alluvial, alluvial-proalluvial and dealluvial-proalluvial soils are characterized by deeper profile and various levels of skeletal texture. Thickness of the soil profile in the upper part, where there are brown soils spread, is 70-100 cm, and the thickness of the humus-containing active layer is 30-50 cm. In the lower part of the zone, where there are alluvial, alluvial-proalluvial and dealluvial-proalluvial soils spread, the profile is deeper exceeding 100-150 cm, with the thickness of the humus-containing active layer of 40-50 cm.

According to texture, the soils are mainly average and heavy loamy, with light clay soils spread along short sections. The content of humus is little amounting to 1,0-2,5%. The content of hydrolysis nitrogen, soluble phosphorus and exchange potassium is low. The soils contain calcium carbonates in little or average amounts, within the limits of 2,5-16,0%. The reaction of soil area (pH) is average alkaline.

The soils spread in the micro-zone with their exposition (the Northern-eastern and the Eastern mainly), content of calcium carbonates and the level of skeletal texture combined with the climatic conditions create beneficial conditions for producing bulk wine Tsinandali.

The main vine species growing here are Rkatsiteli, Saperavi and Kakhuri Mtsvane.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine Tsinandali, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 300-600 m above sea level

Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m; 3,0 x 1,5 m

Height of stem: 70-100 cm

Form of pruning: Free and Georgian two-sided trellis

Norm of loading per 1 sq. m.: 8-10 buds, with 80-100 thousands buds per hectare

Harvest: 9-10 tons per hectare.

SPECIES OF KAKHURI MTSVANE

Plot of planting: 2,5 x 1,5 m; 2,0 x 1,5 m; 3,0 x 1,5 m

Height of stem: 70-100 cm

Form of pruning: Free and Georgian two-sided trellis

Norm of loading per 1 sq. m.: 8-10 buds, with 80-100 thousand buds per hectare;

Harvest: 6-7 tons per hectare

Urgent agricultural measure: Rationing of the buds and yielding tillers remained after pruning under the established agricultural regulations, to gain regulated harvest.

SOIL CULTIVATION

Autumn and spring ploughs of soil, minimum soil cultivation – on the background of periodic use of herbicides, moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching), in the irrigation land – ending the last vegetation irrigation one month before the vintage.

In dry land – preserving the soil surface in weed-free and loose state. Soil mulching with organic mass and synthetic means as it appears possible.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, anthracnose, rots.

Pests: Ticks, the Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

Additional agricultural measures: additional treating measures against powdery mildew.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF RKATSITELI AND KAKHURU MTSVANE

RKATSITELI

Wine species of white grape. It is spread in Georgia and beyond its borders due to its wide ecological plasticity and universal economic-technological properties. The species is of average or late period. It is characterized with abundant harvest (average weight of a bunch is about 160-250 gr.). Average harvest is 9-10 tons per hectare.

Sugar content of the ripe grape in the given micro-zone reaches 240 gr/dm^3, with the acidity of 7,8 gr/dm^3. In order to produce bulk wine Tsinandali, the grape is harvested when the sugar concentration reaches 20-21% in it.

KAKHURI MTSVANE

White vine species for wine-making. The vine is of average grow and of average ripening period.

The average weight of the bunch is 172 gr. and the average harvest is 7-8 tons per hectare. The species accumulates sugar in great quantities (200-220 gr/dm^3) preserving normal rate of acidity (6,0-7,8 gr/dm^3). The peculiarity of the species is particular sensitivity to powdery mildew.

WINE TSINANDALI

Wine Tsinandali is controlled high-quality dry white wine of appellation of origin. It is made with the grape of species Rkatsiteli. 15% of the species of Kakhuri Mtsvane is acceptable to use.

Wine Tsinandali is characterized with light straw color, taste harmonicity, with full, well-developed and elaborate race and species-specific aroma.

Chemical characteristics of the wine Gurjaani should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Mass concentration of sugars of no more than 3 gr/dm^3

Titrated acidity – 5,5-7,5 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE TSINANDALI

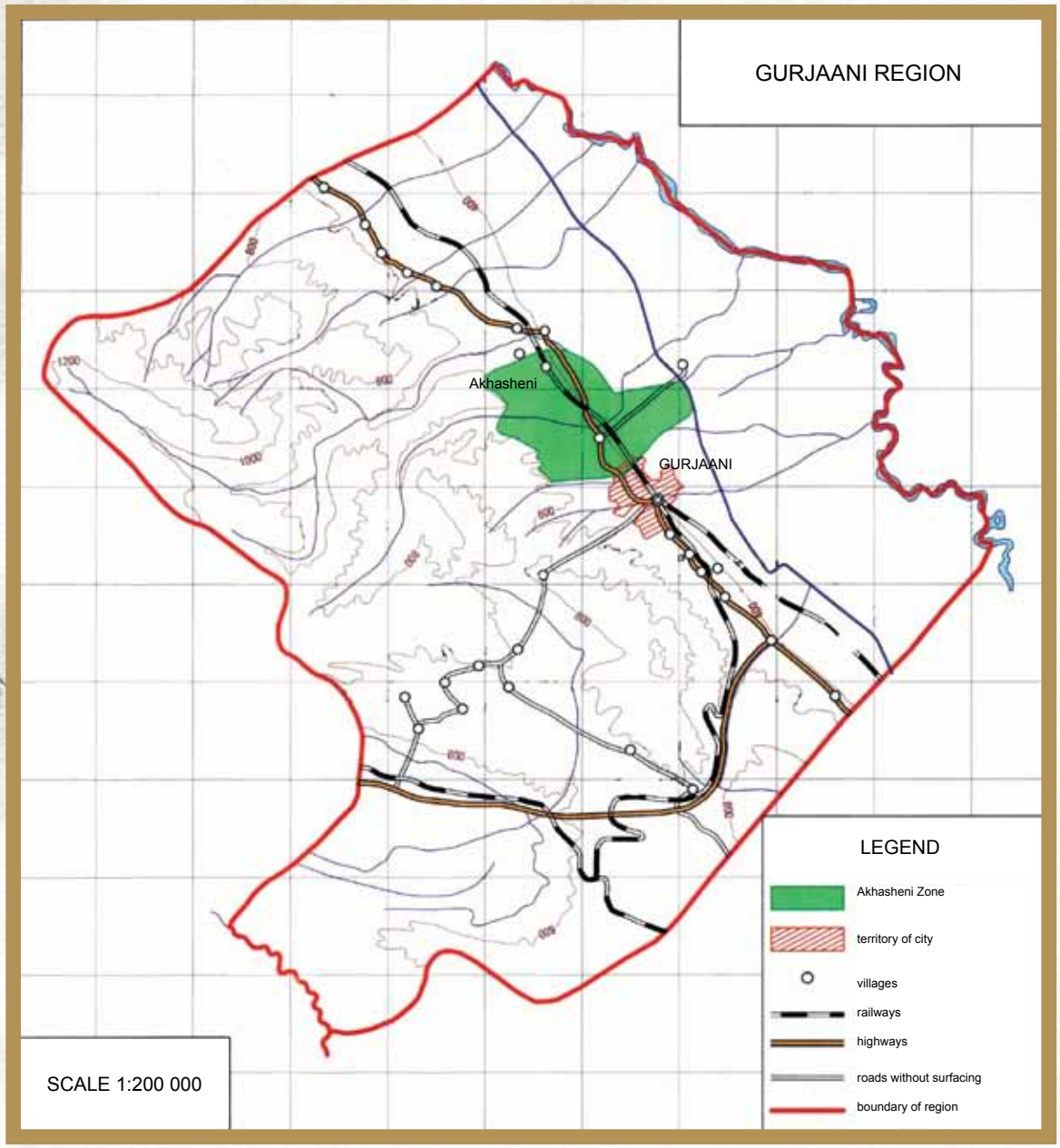
The area for raw material of the wine Tsinandali is 653 ha.

4571 tons of harvest is possible to produce in the micro-zone. At the output of 65 decalitres out of 1 ton, 297 000 decalitres of bulk wine may be produced.

The particular exposition of Tsinandali micro-zone, the microclimate developed on the North-eastern slope of Tsiv-Gombori Ridge, calcareous, alluvial-proalluvial and dealluvial loamy and detritus soils, and harmonization of the species of Rkatsiteli and Kakhuri Mtsvane make for the high value of the wine Tsinandali.

Akhasheni

REG. №4 (30.08.2005)


GURJAANI REGION
Akhasheni
GURJAANI
LEGEND
Akhasheni Zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Akhasheni" Wine

GEOGRAPHICAL LOCATION

Akhasheni is located in Inner Kakheti, in the middle stream of the river Alazani, with the coordinates of the Northern latitude of 41°48' and eastern longitude of 45°44', between the Chermiskhevi and Papriskhevi, the right tributaries of the Alazani of latitudinal direction. Distance from the settlement area of Akhasheni to the river Alazani North-eastwards is 9,5 km, and the distance to the crest of Tsiv-Gombori Ridge, South-westwards, the opposite direction is 14,5 km. In respect of location of vine-making, the territory of Akhasheni includes the continuation of forest-edge slopes of Tsiv-Gombori Ridge and the second terrace of Alazani plain. The vineyards in the micro-zone are located on the areas at 350-700 m above sea level and include middle and upper parts of the villages of Akhasheni and Chumlaki, and the massif of Papris Mindvrebi. The main area of the territory are slightly inclined aprons with a wavy surface the South-westwards, the North-eastwards and the Eastwards. The aprons transfer into plains the North-eastwards and border the first terrace of the Alazani along Chermiskhevi and Papriskhevi.

CLIMATE

The weather in the micro-zone is formed by atmospheric processes developed in subtropical and moderate latitudes and displaced from West to East. Climate is moderately damp here, with hot summer and moderately cold winter. The direction of the gorge of the river Alazani plays a significant role. Cold air masses blowing from high peaks of Kakheti mounts covered with the Caucasioni glaciers move from the North-West to South-East, to the foothills of the North-Western slope of Tsiv-Gombori and to the plain areas.

The sun altitude from the horizon for Akhasheni latitude during the formation of grape seeds is 70-60°C, and 50-40°C during the grape ripening period what creates an efficient radiation regime for the vine on the slightly inclined (2-3°C) slopes the North-Eastwards.

During the periods of formation (second half of June, July and first half of August) and ripening of the grape seeds (from the second half of August to the end of September) in the micro-zone, the clearness of the dome of the sky is 6 and 8 days, respectively. The number of cloudy days during the mentioned periods is at most 3 and 1, respectively.

The annual duration of sunshine in Akhasheni micro-zone is 2150-2200 hours, with 1600 hours during the vegetation period. Total solar radiation in the micro-zone of Akhasheni, on the right side of the river Alazani is more than on its left side caused by less cloudiness of the dome of the sky. The annual sum of radiation in Akhasheni zone is 130 kcal/cm^2, and 95-100 kcal/cm^2 during the vegetation period.

Direct annual radiation on the horizontal surface is 75 kcal/cm^2, and the dissipated radiation is 54 kcal/cm^2.

Following the analysis of depth temperature isopleths of alluvial-calcareous soil, at the depth of 5-50 cm, a stable transition of temperature above 10°C takes place in the first decade of April, and at higher depths of 50-100 cm, it does not take place until the middle of April.

Activation of the root system starts in the middle of May when temperature in the soil layer of 10-120 cm depth rises over 15°C. From the middle of June until the end of September, or for over three months, the temperature in the soil layers of the depth of 5-70 cm is over 20°C, and the temperature of soil at the depth of about 40 cm reaches 24°C from the middle of July to the end of August.

In the micro-zone the average annual air temperature is 12,5°C. The warmest months are July and August, with their average temperatures of 23,7°C and 23,5°C; the average temperature of the coldest month (January) is +1,1°C. Following the many-year data, the average of the annual absolute minimums of air temperature is -10 – -11°C, and the average of the annual absolute maximums is 35°C. Extreme temperatures are -23°C and +38°C.

The first autumn night frosts usually start at the end of November (27.XI). Once in every 10 years, the first frosts may take place earlier, from 26.X what does not endanger vine. The last frosts usually end on March (24.III.) Once in every 10 years, the frosts may end in the middle of April. In such a case, if buds blossom earlier than usual (at the end of March or at the beginning of April) as it happened in spring of 2004, the night frosts are very dangerous.

The active heat accumulated at the altitude of 450 m in Akhasheni micro-zone is 3950°C, and 3700°C - at the altitude of 620 m. A stable transition of air temperature above 10°C at the height of 450 m takes place on April (5.IV.) and the fall of temperature below 10°C takes place from November (4.XI.).

Annual sum of atmospheric precipitations in Akhasheni micro-zone is 860 mm, with 637 mm in the vegetation period. The amount of precipitations during the fruit formation period is 250 mm. The sum of moisture deficit in the ground-edged air layer is 765 mm (Gurjaani). The mentioned indicators mean that the moisture-content in the given micro-zone is not sufficient (0,39) for a vine, and therefore, during the given period, vine needs irrigation: W = 0,4 x 765 – 250 = 306 – 250 = 56 = 560 m^3, i.e. 560 m^3 water is needed per hectare. The period of grape ripening is moderately humid and the vine needs no irrigation.

Average relative humidity of air is 71%. Air imbibition is the least in July and equals to 63% and in August equalling to 60%. This indicator is relatively higher at the end of autumn (78%) and in winter (76-75%).

The recurrence of the days with hail during the warm period of the year at the North-western districts (Tsinandali, Telavi) of the right bank of the river Alazani is relatively sharply reduced. The average annual number of the days with hail is 1,6-2,1. May is the month with the most frequent hail (0,7 days) and June with 0,5 days with hail.

The buds of Saperavi blossom in the middle of April and flower in May. The

grape ripens in the second half of August. The technical ripening of grape takes place at the end of September. In order to gain a raw material of good quality (with sugar content of >21% and acidity of 6,0-7,5 gr/dm^3) for European-type table wine 3800°C of active heat is necessary, which in Akhasheni micro-zone accumulates at the altitude of 550 m (50%).

The premium-quality Akhasheni bulk wine from the areas at the height of 450-500 m can be gained 3-4 times in ten years. The number of the period the same material can be gained is less at lesser altitudes.

The amount of heat (>4100°C) necessary for gaining naturally semi-sweet bulk wine (with sugar content of >26%) is accumulated at the height of 350 m (50%) on average. For this purpose, the grape should be harvested in the first half of October. At the height of 400 m, where the average amount of heat is approximately 4000°C, naturally semi-sweet bulk wine can be produced once in every 10 years, and also once in every 10 years at the height of 500 m.

The snow cover appears in the last decade of December (from 25.XII) and melts from the middle of March. In 74% of years, the snow cover is not stable. The number of snowy days in winter is 26.

The average of the annual absolute minimums of the air temperature is -10 – -11°C. Once in every 10 years, minimum temperature of -15°C with little duration is expected what will only slightly damage the vine buds (up to 30%).

Winds of the Western (32%) and the South-western (23%) directions prevail in the micro-zone. The number of days without wind is about 21% per annum. At night, before the sunrise, the cold air masses flowing down the high tops of the Caucasioni Mountains intensify the danger of winter frosts and spring night frosts. Generally, the micro-zone belongs to the third group of wind adverse activity. Average annual wind speed is 1,4 m/sec. The wind speed in different months is almost the same. The number of days with strong wind is only 4 per annum. In the best instance, two-row windbreaks are recommended.

SOIL

Following the results of the studies, there are two varieties of Rendzina-brown soils, two varieties of alluvial and one variety of dealluvial soil distinguished in the micro-zone:

1. Rendzina-brown loamy soil of great thickness;
2. Rendzina-brown clay and heavy loamy soil of great thickness, weakly skeletal here and there;
3. Alluvial-calcareous loamy soil of great thickness;
4. Alluvial-calcareous loamy soil of great thickness, skeletal;
5. Dealluvial calcareous loamy soil of great thickness.

The first two varieties of soils are spread in the extreme South-Western part of the micro-zone, on the North-Eastern slopes of Tsiv-Gombori mountains, and namely, in the massif of Papari Fields on the territory of Akhasheni and in the South-Western part of Chumlaki territory. The 3-rd and 4-th soil varieties are spreads in the central

and the Northern-eastern parts of the mentioned villages, on the second terrace of the river Alazani, along the rivers Chermiskhevi and Papriskhevi, on the plain forms of inclined relief. The 5-th variety of soils are mainly spread in the central part of the micro-zone, at the foot of the southern slopes of Tsiv-Gombori mountains and are slightly inclined aprons by their relief.

Thickness of profile of the first soil variety is 70-90 cm, and that of the humus-containing active layer is 50-60 cm. Thickness of the profile of the second soil variety is 60-90 cm, with the humus-containing active layer of 40-50 cm thick. They are characterized by skeletal texture here and there. Both soil varieties spread on high-calcareous loamy-limestone deposits. The soils of 3-th, 4-th and 5-th varieties have deep profiles of over 1,5 m, with the thickness of humus-containing active layer of 50-60 cm. They are developed on loamy-limestone and loamy-sandy deposits Humus-containing layer of the first two varieties of soils is dark brown, and the soils themselves are of blackish brown colour. They are light brown in the transition layer, with straw tint and of light straw colour with whitish tint in the lower layer. The soils of the 3-rd, 4-th and 5-th varieties are of light brown colour with less differentiated colours in the profiles. The soil of the 4-th variety is characterized by skeletal texture.

According to the data of laboratory analysis, the soils of the first two varieties are of clay and heavy loamy texture, and the soils of the 3-rd, 4-th and 5-th varieties are loamy soils. According to the content of humus in the soils of the 1-st and 2-nd varieties, it is average in the active layer amounting to 3,5%, and decreasing in the lower layers. The same indicator in the 3-rd, 4-th and 5-th varieties of soils is relatively less varying between 1,5-3,0% in the active layer, decreasing in lower layers. The soils are poor in hydrolysis nitrogen, soluble phosphorus and exchange potassium. The content of carbonates in the first and second varieties of soil is average in the upper layers, reaching extremely high amounts in the lower layers of 40-50%. The same indicator in the 3-rd, 4-th and 5-th varieties of soils is mainly average. The reaction of soil area (pH) is average and mostly within the limits of 7,5-8,6.

Following the conducted studies, the agricultural characteristics of the soils spread on the territory of the micro-zone enable to produce high-quality bulk wine “Akhasheni”.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of appellation Akhasheni, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF SAPERAVI

Growing area: Up to 350-700 m above sea level
Plot of planting: 3,0 x 1,5 m; 2,5 x 1,5 m; 2,5 x 1,25 m
Height of stem: 60-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds; 80-100 thousand buds per hectare
Harvest: 7-8 tons per hectare.

SOIL CULTIVATION

The vegetation irrigation in the irrigation area should be ended one month before the vintage autumn and spring ploughs of soil. Minimum soils cultivation. Moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching).

In dry land – on the slopes of average inclinations carrying out anti-erosion measures with minimal and zero soil cultivation; soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rots.

Pests: Ticks, Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

Urgent measure: Rationing high-yielding tillers in accordance with the established agricultural regulations.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF SAPERAVI

Saperavi, by its economic designation is red-grape wine species. In the given micro-zone it produces invaluable material for semi-sweet bulk wine.

The vine is stronger than average grow. The harvest per hectare to gain the conditional production varies between 7-8 tons. Sugar content of the ripe grape reaches 260 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3. The bunch on average weighs 140-145 gr. It is characterized by fall of flowers, against which the tips of tillers should be torn off 2 or 3 days before flowering. It is not sensitive to fungus diseases.

WINE AKHASHENI

Akhasheni – Controlled high-quality, red naturally semi-sweet wine of appellation of origin. It is characterized by dark ruby color, with species-specific taste, harmonious, elaborate, full, piquant, pleasant sweetness, fruit tones and species-specific aroma.

Chemical characteristics of the wine "Akhasheni" should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars of no more than 30-50 gr/dm^3

Titrated acidity – 5,0-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE AKHASHENI

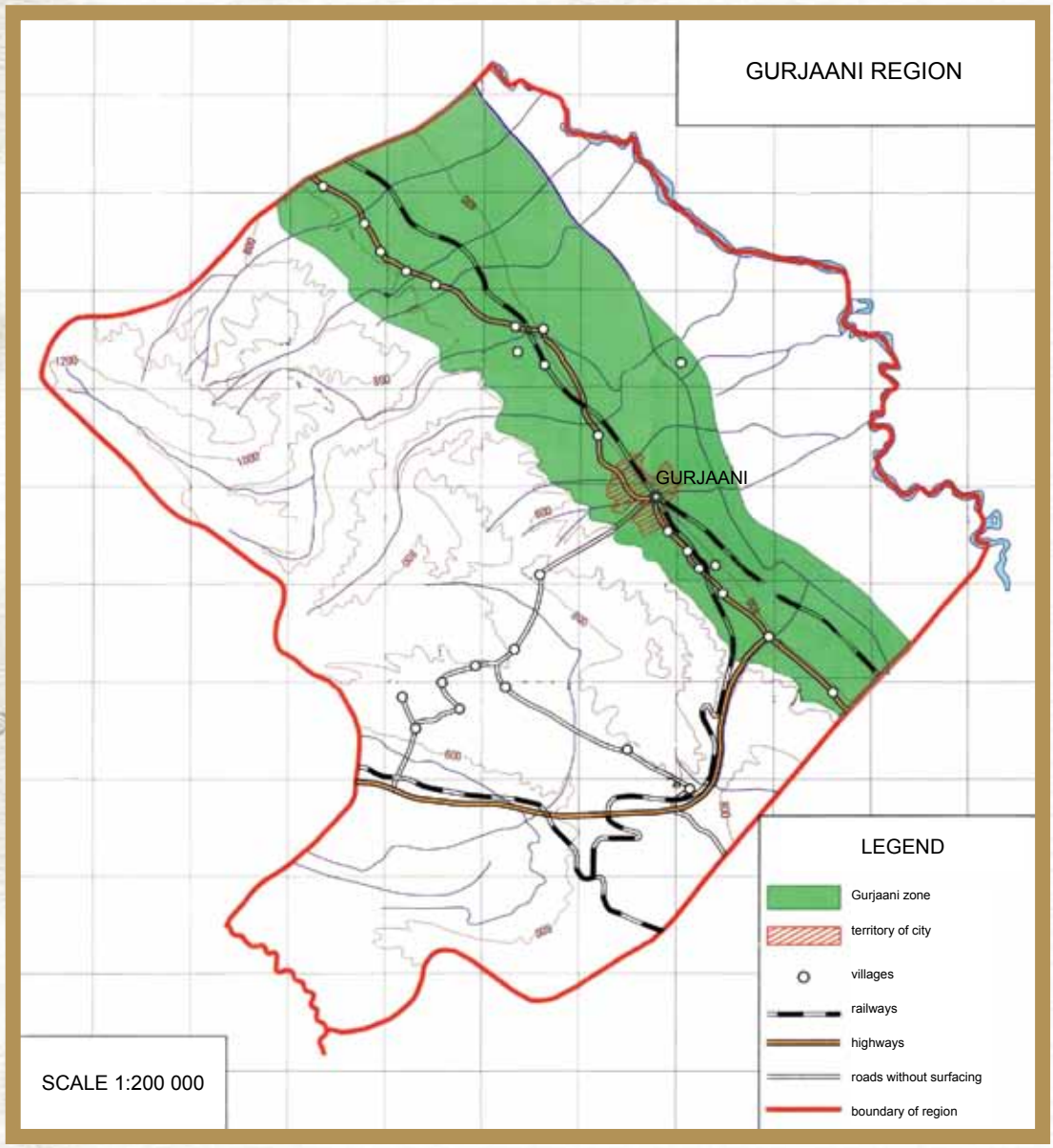
The areas for raw material of the wine Akhasheni are approximately 112 ha.

Approximately 728 tons of harvest is possible to produce in the micro-zone. At the output of 65 decalitres out of 1 ton, 47 000 decalitres of bulk wine may be produced.

The location of Akhasheni micro-zone, the microclimate of forest-edged slopes of Tsiv-Gombori mountains, calcareous and loessial, loamy-clay and alluvial-dealluvial soils and high indicator of sugar content of the vine species of Saperavi make for peculiar values of wine Akhasheni.

Gurjaani

REG. №5 (30.08.2005)


GURJAANI REGION
GURJAANI
LEGEND
Gurjaani zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Gurjaani" Wine

GEOGRAPHICAL LOCATION

The micro-zone is located in the middle stream of the river Alazani, on its right side with the coordinates of the Northern latitude of 41°45' and the Eastern longitude of 45°48'. The territory of the micro-zone includes foothills adjacent to the woody slopes of the Northern-eastern inclination of Tsiv-Gombori Ridge and Alazani Lowland from the populated area the North-eastwards. Distance to the river Alazani along a straight line is 10 km. and the distance to the crest area of Tsiv-Gombori Ridge South-Westwards is 17 km. The altitude of the extreme points of micro-zones varies within the limits of 250-1000 m above sea level. The micro-zone includes the villages of Inner Kakheti – Bakurtsikhe, Kolagi, Vejini, Dzirkoka, Chandara, village of Gurjaani, district zone of the city of Gurjaani, part of the territories of Kotekhi, Chumlaki, Shashiani and Vachnadziani, beginning from the second terrace of Alazani plain and spreading on the Northern-eastern slopes of Tsiv-Gombori mountains.

CLIMATE

The weather in the micro-zone is mainly formed by the atmospheric processes developed in subtropical and moderate latitudes and displaced from East and West The climate here is moderately humid, with hot summer and moderately cold winter.

The average annual duration of sunshine is 2150-2200 hours, and 1550-1600 hours during the vegetation period. The annual sum of solar radiation in the micro-zone on the horizontal surface is 71 kcal/cm^2. The dissipated radiation of 49 kcal/cm^2, with 35 kcal/cm^2 in the vegetation period. The annual indicator of the summary radiation is 120 kcal/cm^2, and that in the warm period is 90 kcal/cm^2.

Average annual air temperature is quite high equalling to 12,4°C. The warmest months are July and August with the equal average air temperature of 23,6°C. The average air temperature of the coldest month (January) is +0,9°C.

Average of the annual absolute minimums of air temperature is -10°C, and the average of the annual absolute maximums of air temperature is +35°C. Extreme temperatures are -22°C and +38°C.

A stable transition of the air temperature above 10°C in most of the region takes place on the first decade of April (5.IV), and falling of temperature below the mentioned point takes place in the first days of November (3.XI). So, the duration of the vegetation period is 211 days. The sum of active temperature during the given period is up to 3930°C.

The annual number of clear days (0-2 points) in Gurjaani micro-zone, according to general and lower cloudiness is 51 and 132, respectively. During the vegetation period, this indicator, according to the above-mentioned indicators of cloudiness, equals to 36 and 79 days, respectively.

Annual number of cloudy days (8-10 points) according to general and lower cloudiness is 113 and 59, respectively, and the same is during the vegetation period is 54 and 26, respectively.

During 85 days from the beginning of summer, average daily air temperature in the micro-zone is higher than 20°C. During this period, for 34 days in June – July (10.VII-13.VIII) the average air temperature is 23°C and over.

The first autumn night frosts start in the third decade of November (25.XI). Once in every 10 years, early frosts may take place at the end of October (30.X) that is not dangerous for the vine. The last night frosts on average end of March (24.III.). Once in every 10 years the spring frost may last until the middle of April.

Average annual sum of atmospheric precipitations in the micro-zone is 804 mm, with 578 mm in the vegetation period. Maximum annual precipitations (124 mm) fall in May, and the minimum precipitations (32 mm) fall in January. The precipitations fall as snow in the last days of December disappearing before the middle of March. In the given period, a snow cover of 6-7 cm of average decade height is preserved for 25 days.

Average relative humidity of air is 72%. Air imbibition is the greatest in November (80%) and is the least in August (64%).

The annual number of the days with hail is 1,7 on average. May and June are the months with most frequent hails (0,6-0,4 days). In exceptional years, it may hail 6 times a year.

Following the analysis of temperature isopleths of alluvial-calcareous soils, in the layers of 5-50 cm depth a stable transition of average temperature above 10°C takes place in the first decade of April, and at greater depths (50-100 cm) it takes place in the middle of April.

Activation of the root system starts in the middle of May when temperature in the soil layer of 10-120 cm depth rises over 15°C. From the middle of June until the end of September, or for over three months, the temperature in the soil layers of the depth of 5-70 cm is over 20°C.

Winds of the South-Western (33%) and Western (18%) directions prevail in the micro-zone. They are rarely changed for Eastern (12%) winds. Average annual wind speed is 1,7 m/sec. Maximum wind speed (1,9 m/sec) during the year is expected in March and the least wind speed (1,5 m/sec) is expected in December.

For production of European and Kakhetian wines the recommended vine species are Rkatsiteli, Kakhuri Mtsvane and Saperavi. Buds of these species start open from the middle of April, they start flowering at the end of May, the grape is ripened in the second half of August, the grape is technically ripened (with 19-21% of sugar content and 6,5-7,5 gr/dm^3 titrate acidity) in the last days of September. Gaining of the high-quality raw material for table wines of a European type needs 4000°C heat, which in Gurjani micro-zone is accumulated on average (50%) at about 420 m altitude.

The premium-quality bulk wine from the areas located at the height of 450-500 m can be gained four or three times in every ten years and the bulk wine of good quality may be gained seven or five times in every ten years; the best-quality product

at the height of 550 m may be gained once in every 4 years (25%), and we can gain good-quality product five times in every 4 years. At the height of 600 m, we can gain premium-quality product once in every 10 years, and the product of good quality – once in every four years.

The necessary amount of heat (>4100°) to gain naturally semi-sweet bulk wine (with the sugar content >26%) is on average (50%) accumulated here at about 360 m height. Grape should be harvested in the first half of October. At the altitude of 400 m, such bulk wine is produced once in every 4 years, and at the height of 500 m, it is gained once in every 10 years.

According to multi-year data, the average of annual absolute minimums of air temperature is -10°C. Once in every 10 years, the minimum temperature is expected to fall to -15°C causing only slight damage to the vine buds (<30%).

SOILS

According to the available studies there are 4 types of brown soils, 4 types of brown meadow soils, 5 types of alluvial soils and 2 types of dealluvial soils distinguished in the micro-zone:

1. Dark brown clay soil of great thickness;
2. Dark brown weak skeletal clay soil of great thickness;
3. Rendzina brown, of great thickness, clay;
4. Brown, of great thickness, skeletal, loamy;
5. Brown meadow, of great thickness, clay;
6. Brown meadow, of great thickness, loamy;
7. Brown meadow, of great thickness, weakly skeletal, loamy;
8. Brown meadow, of great thickness, silt from the depth of 110-120 cm, with ground water standing from the depth of 140-150 cm, heavy clay;
9. Alluvial calcareous, of great thickness, clay;
10. Alluvial calcareous, of great thickness, loamy;
11. Alluvial calcareous, weakly skeletal, loamy;
12. Alluvial calcareous, of great thickness, average skeletal and stony loamy;
13. Alluvial calcareous, of great thickness, periodically with excess moisture, with the ground water standing from the depth of 120-140 cm, clay;
14. Dealluvial calcareous, of great thickness, loamy;
15. Dealluvial calcareous, of great thickness, weakly skeletal and stony, loamy.

The first three varieties of the above-mentioned soils are spread in the upper belt of the micro-zone, on the North-Eastern slopes of Tsiv-Gomobori mountains and on slightly inclined slopes. The soils of the fourth and fifth varieties are mostly spread in the middle belt of the mentioned slopes and slightly inclined slopes and plains. The soils of the fifth, sixth, seventh and eighth varieties are spread on foots of the above-mentioned slopes, bordering directly Alazani plain and are also spread on the plain relief. The soils of the mentioned varieties are slightly inclined North-Eastwards and the South-eastwards. The soils of the ninth and thirteenth varieties are spread in the upper part of Alazani plain, bordering the foot of the Northern-eastern slopes of

Tsiv-Gombori mountains, along the irrigation channel of lower Alazani. The soils of the fourteenth and fifteenth varieties, which are talus, are mainly spread on foots of the above-mentioned slopes, on slightly inclined aprons.

The first three soils varieties, which are spread on the most upper belt of the micro-zone, are characterized by great thickness of profile of 70-100 cm, with the thickness of the humus-containing active layer of 45-60 cm. By texture, the soils are clay. The soil of the second variety is characterized by skeletal texture. The soils of all three varieties have high content of carbonates in the lower layers. This is particularly true with the soil of the third variety. The mentioned soils are spread on loess clays and calcareous sediments. In the upper humus-containing active layer, it is characterized by dark brown colour, with straw-whitish colour in the lower layers. The soil of the fourth variety, which is mainly spread in the middle zone of the micro-zone, is characterized by average and weak skeletal texture, with great thickness of profile (80-120 cm). The thickness of the humus-containing active layer is 50-60 cm. The soil is loamy by texture. Its colour is brown, with straw colour in lower layers. It is calcareous along the whole profile. The soils of the fifth and eighth varieties, spread in the lower belt of the micro-zone, have brown and dark-brown blackish colour. They are characterized by great thickness of profile (100-150 cm) and great thickness of humus-containing layer (60-70 cm). By texture, the soils of the 5-th and 8-th varieties belong to the group of clay soils, and those of the 6-th and 7-th varieties belong to the group of loamy soils. The soil of the 7-th variety is characterized by weakly skeletal texture, and the soil of the 8-th variety is distinguished for more excess of moisture being silt from the depth of 100-120 cm, with the ground water standing at the depth of 140 cm. The soils of the 9-th and 13-th varieties are mainly spread in the Southern-western part of the Alazani plain and along the tributaries of the Alazani. These soils are characterized by great thickness of their profiles (100-150 cm) and with the thickness of the humus-containing active layer of 50-70 cm. They have brown and taupe colour. By mechanical texture, the soils of the 9-th and 13-th varieties are clays, and those of the 10-th and 12-th varieties are loamy. The soil of the 11-th variety is characterized by weakly skeletal structure, and that of the 12-th variety has average skeletal and stony texture. The soil of the 13-th variety is characterized by periodically excess of moisture and ground water standing from the depth of 120-140 cm. The soils of the 14-th and 15-th varieties, which are mainly spread at foots of the Northern-eastern slopes of Tsiv-Gomobori mountains, are characterized by a great thickness of profile (70-120 cm). The thickness of humus-containing active layer is 40-50 cm. Their colour is brown and according to texture, they belong to loamy soils. They are calcareous along the whole profile. The soil of the 15-th variety is characterized by skeletal and weak stony texture what creates best conditions to produce high-quality wines. The soils of the 1-st, 2-nd, 3-rd, 5-th, 8-th, 9-th and 13-th varieties belong to clay soils, and the rest of the soils of the 4-th, 6-th, 7-th, 10-th, 11-th, 12-th, 14-th and 15-th varieties belong to the loamy group of soils. The content of humus in the trenching layer of the soil varies mainly within the limits of 1,5-4,5%, and 3,5-5,5% in the soils of the first three varieties, decreasing in lower layers. The soils are mostly poor in soluble phosphorus (1,5-2,5 mg in 100 gr of soil). In some cases, phosphorus

is spread as a trace only. The content of exchange potassium is mainly low and varies within the limits of 3,5-25,0 mg in 100 gr. of soil. The content of calcium carbonates is mainly average. This indicator is quite high with the first three types of soils reaching 40-60%. The reaction of soil area is mainly average or weak alkaline and pH indicator is within the limits of 7,5-8,3.

Following the accomplished studies, the characteristics of the soils spread in the micro-zone are one of the determinants for producing the wines "Gurjaani".

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce Gurjaani bulk wine, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 320-750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m; 3,0 x 1,5 m
Height of stem: 70-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds, with 80-100 thousand buds per hectare
Harvest: 9-10 tons per hectare.

SPECIES OF KAKHURI MTSVANE

Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m; 3,0 x 1,5 m
Height of stem: 60-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds, with 80-100 thousand buds per hectare
Harvest: 6-7 tons per hectare.

SOIL CULTIVATION

In the irrigation land – ending the last vegetation irrigation one month before the vintage.

Autumn and spring ploughs of soil.

Moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching).

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rot.

Pests: Ticks, the Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF RKATSITELI AND KAKHURU MTSVANE

RKATSITELI

Wine species of white grape. It is distinguished by high economic-technological properties, resistance in various conditions and high dignity of production. The species is of average late or late period. It is characterized with abundant harvest (average weight of a bunch is about 160-250 gr.). Average harvest is 9-10 tons per hectare.

Sugar content of the ripe grape reaches 240 gr/dm^3, with the acidity of 7,8 gr/dm^3.

KAKHURI MTSVANE

Georgian white wine species. The wine is of average grow and of average ripening period.

Its bunches are of average size with the average weight of 172 gr. and the average harvest is 6-7 tons per hectare. The species accumulates sugar in great quantities (220 gr/dm^3) preserving normal rate of acidity (6,0-7,8 gr/dm^3).

WINE GURJAANI

Wine Gurjaani is controlled high-quality dry white wine of appellation of origin. It is made with the grape of species Rkatsiteli. 15% of the species of Kakhuri Mtsvane is acceptable to use.

Wine Gurjaani is characterized with light straw color, taste harmonicity, full species-specific aroma, and well-developed race.

Chemical characteristics of the wine Gurjaani should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Mass concentration of sugars of no more than 3 gr/dm^3

Titrated acidity – 5,5-7,5 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

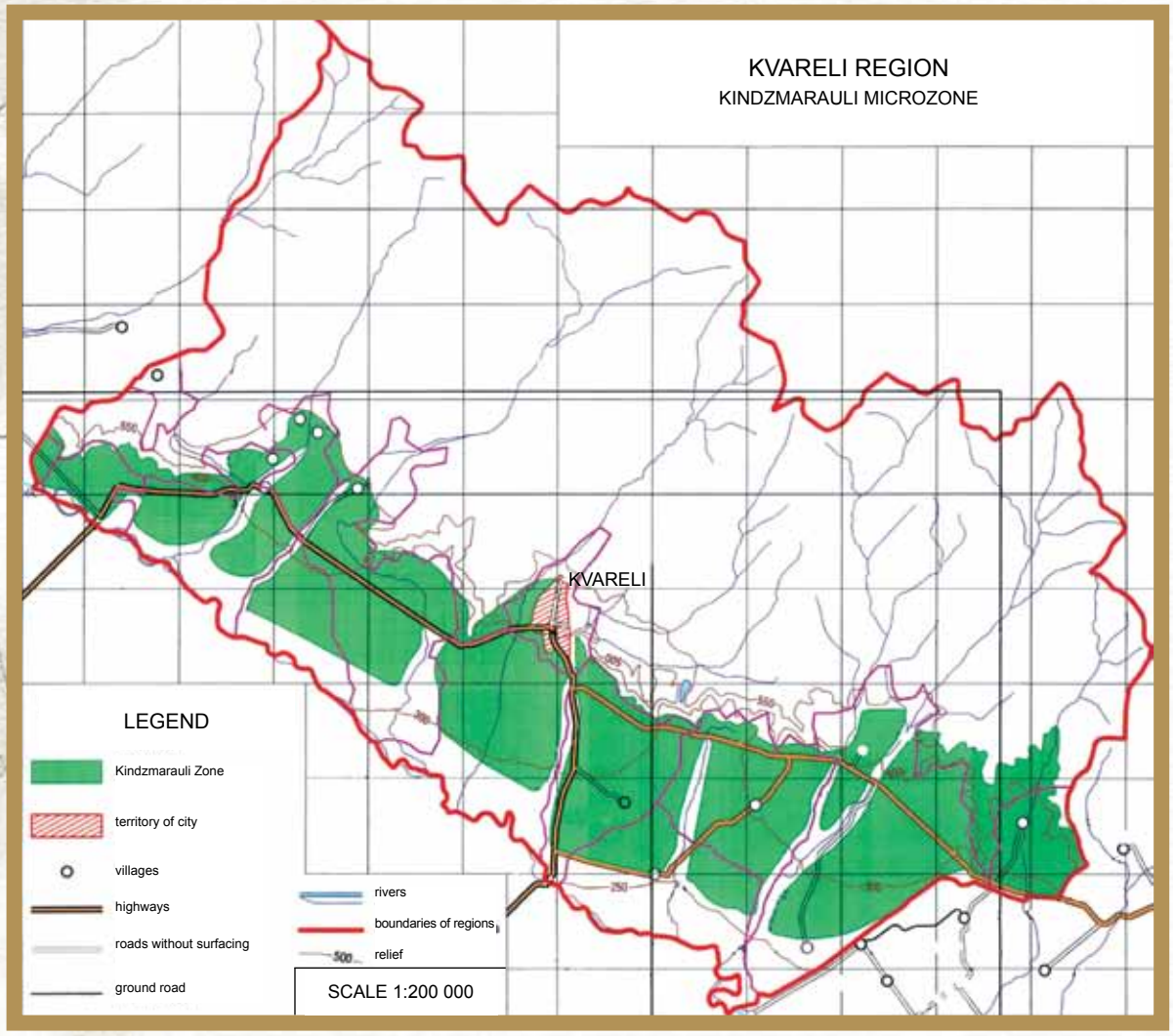
AVAILABLE AREAS FOR RAW MATERIALS OF WINE GURJAANI

The area for raw material of the wine Gurjaani is 1151,5 ha. 8636 tons of conditional grape harvest is possible to produce in the micro-zone. At the output of 65 decalitres out of 1 ton, 561 000 decalitres of bulk wine may be produced.

The location of Gurjaani micro-zone, the microclimate developed on the slope of Tsiv-Gombori Ridge, brown, brown meadow, alluvial and dealluvial soils and originality of the species of Rkatsiteli and Kakhuri Mtsvane make for the peculiar features of the wine Gurjaani.

Kindzmarauli

REG. №787 (30.03.2006)


KVARELI REGION
KINDZMARAULI MICROZONE
KVARELI
LEGEND
Kindzmarauli Zone
territory of city
villages
highways
roads without surfacing
ground road
rivers
boundaries of regions
relief
SCALE 1:200 000

Appellation of Origin of "Kindzmarauli" Wine

GEOGRAPHICAL LOCATION

The micro-zone of wine Kindzmarauli is located in the Eastern Georgia, in Inner Kakheti, in the administrative region of Kvareli, on the the Southern slope of Caucasioni fork, with the coordinates of the Northern latitude of 41°30' and the Eastern longitude of 45°50'. Industrial vineyards are mainly located at 250-550 m above seal level, on the left side of the river Alazani (Gagmamkhari (The other bank of the river)). The plain foots are occupied by Alazani plain, which is elevated northwards, transmits into the foothills and borders the foots of Caucasioni.

The territory to produce the bulk wine of Kindzmarauli includes a part of Inner Kakheti, the left second terrace of the river Alazani, and the right and left banks of the Duruji, Bursa, Chelta, Intsoba, Avaniskhevi and Shorokhevi, the rivers flowing into the Alazani. No North, the territory borders the foot of the Southern slopes of Caucasioni. The Western part of the mentioned territory, beginning from the right side of the river Duruji, in relief is more a plain with slightly wavy surface inclined to the South-westwards, with the rest of the territory being a plain inclined southwards in the East. The mentioned zone is located at 250-550 m above sea level and includes the administrative territories of Kindzmarauli and Kvareli, and the following parts of the villages in the West: middle and upper parts of Shilda, Eniseli, Sabue, Almata, Gremi and Shakriani, located on the second terrace of the river Alazani. In the East, the zone includes the principal territories of the villages of Patmasuri, Sanavardo, Kuchatani, Tsitskaant Seri, Chantlis Kure, Zinobiani, Akhalsopeli, Tkhilis Tskaro, Mtis Dziri and Chikaani and partly, the territories of the villages of Gavazi and Baglojiani, up to the first terrace of the Alazani. The total area of the mentioned micro-zone is about 2400 ha.

CLIMATE

The weather in Kindzmarauli micro-zone is mainly formed the air masses developed in subtropical and moderate latitudes moving from the West to the East under the influence of high-mountainous system. Because the gorge is open South-eastwards and is closed the North-westwards and the Southwards, the winds of North-western and South-eastern direction along the gorge prevail here. Due to specifically closed gorge, the wind speed is not high. The climate is moderately humid with long warm summer and moderately cold winter.

The available vineyards and areas for vineyards are mainly located on the Southern slopes inclined at 2-3°. During the period of formation and ripening of the grape bunches, the height of the Sun's for Kindzmarauli latitude is 60-70° and 40-50°, respectively. The annual duration of sunshine is 2050 hours.

During the period of formation and ripening of the bunches of grape, the

cloudiness of 8-10 points of the dome of the sky is 20 and 18 days successively, and the number of clear days (0-2 points) with cloudiness is 15 and 16.

Besides, in the gorges of latitudinal direction, such principal agro-climatic factors formed on the foothills of the Southern inclination, as energy of sunrays, amount of heat, moderate summer temperature, sufficient moisture of the location allow producing high-quality product of Saperavi.

On the surface of slates of blackish colour drifted by the river Duruji, the temperature is higher during the day. During the afternoon hours, the temperature is 3-5°C more than that of the surface of alluvial-non-calcareous soils of the adjacent forest.

The soil of blackish colour has less ability to reflect the solar rays energy distributed on its surface (15%). As a result of more absorbed energy, the soil temperature increases. 20% of the vines planted on these soils have the ability to reflect sunrays.

In the micro-zone of Kindzmarauli, average annual air temperature is 12,5°C. The warmest months are July and August, with their average temperature of 23,6°C; the average temperature of the coldest month is +1,0°C. Following the multi-year data, the average of the annual absolute minimums of air temperature is -10 – -11°C, and the average of the annual absolute maximums is 35°C. Extreme temperatures are -23°C and +38°C. In spring, a stable transition of the average daily air temperature over 10°C takes place in April (5.IV) and in autumn, the temperature falls below 10°C in November (4.XI). Thus, the warm period lasts 212 days. The buds of Saperavi start blossoming in the middle of April (from 15.IV). They flower at the end of May, and the grape starts ripening in the second half of August (from 20.VIII). The grape is technically ripened at the end of September. In order to gain naturally semi-sweet bulk wine, the grape should be harvested in the middle of October.

In the micro-zone of Kindzmarauli, the first autumn night frosts start from November (21.XI). Once in every 10 years, the first frosts may start earlier, at the end of October. The last night frosts in spring on average end from March (26.III). Once in every 10 years, the last frosts may last until the middle of April. Duration of frost-free period in the zone is 239 days.

In the micro-zone of Kindzmarauli at 350-550 m above sea level, total active temperatures (>10°C) is 4100-3700°C. In order to gain naturally semi-sweet bulk wine (>26% and 6,8gr/dm^3), Saperavi on the plots at the height of 350 m will be produced five times in 10 years (50%); at the height of 400 m, the same indicator will be three or four times in every 10 years (35%), and at the height of 450 m, it is once in every 10 year (10%).

As for high-quality table wine of an European type, it can be produced from the grape on the land plots at the height of 350 m 7-8 times in 10 years (75%), at the height of 400 m, this indicator is 5 times in 10 years (50%), at the height of 450 m, it is once in every 4 years (24%), and at the height of 500 m, it is once in every 10 years (10%). In other years, good-quality natural vintage bulk wine will be gained.

The annual sum of atmospheric precipitations in the micro-zone of Kindzmarauli is 1070 mm, with 800 mm during the vegetation period.

Average relative air humidity is 72%. The air imbibition is the least in summer months (June, July and August) (66-64%), and is relatively high at the end of autumn and at the beginning of winter (80%).

The snow cover appears in the last decade of December (25.XII) and melts in the middle of March. The number of snowy days in winter is not more than 21. The snow cover in the micro-zone is unstable (87%).

The average annual number of days with hail is 2.1 It most often hails in May (0,9 days). The number of days with hail in the months of April, June and July does not exceed 0,3 in each month.

Average of the annual absolute minimums of air temperature is -10 – -11°C. Once in every 10 years the minimum temperature may fall to -15° what causes slight damage to the vine fruit buds (30%).

The winds blowing from Western (23%) and South-eastern (17%) directions prevail in the micro-zone. The proportion of days without wind in the year is 31%. The wind speed is accelerated here by the winds of mountains and gorges. At night, before the sunrise, the cold air masses blowing down the Caucasioni high mountains intensify the danger of winter frosts and spring night frosts. This micro-zone of Alazani gorge belongs to the regions of the III group of wind activity.

SOIL

According to the conducted studies in 2005, there have been indicated two types of alluvial soils, with nine varieties and two types of dealluvial soils with five varieties identified in the micro-zone:

1. Alluvial, non-calcareous, loamy soils of great thickness;
2. Alluvial, non-calcareous, weakly skeletal, loamy soils of great thickness;
3. Alluvial, non-calcareous, average skeletal, average and weak loamy soils of great thickness;
4. Alluvial, non-calcareous, strongly skeletal loamy soil of great thickness;
5. Alluvial, weakly calcareous loamy soil of great thickness;
6. Alluvial, weakly calcareous, weakly skeletal loamy soil of great thickness;
7. Alluvial, weakly calcareous, average skeletal loamy soil of great thickness;
8. Alluvial, non-calcareous, loamy and clay of great thickness with excess moisture and bogged soil;
9. Alluvial, weakly calcareous, loamy and clay with excess moisture and bogged soil;
10. Dealluvial non-calcareous loamy soil of great thickness;
11. Dealluvial, non-calcareous, weakly skeletal loamy soil of great thickness;
12. Dealluvial, weakly calcareous, clay soil of great thickness;
13. Dealluvial weakly calcareous, weakly skeletal, loamy and clay soil of great thickness;
14. Dealluvial, weakly calcareous, with excess moisture, clay soil of great thickness.

The first ten varieties of soils among the above-listed ones are spread on the second terrace of the river Alazani and are mainly characterized by the forms of plain relief. The 11-th, 12-th, 13-th and 14-th varieties of dealluvial soils are spread on foots of the Southern slopes of the Caucasioni and directly border the Southern slopes, located at 400-500 m above sea level. By relief, these areas are slightly inclined aprons to southwards and south-westwards.

The first-tenth varieties of alluvial soils are characterized by great thickness and differ with the degree of skeletal texture, content of carbonates, degree of excess moisture and bogging. The first seven varieties of soils out of the mentioned types are characterized by great thickness of profile of 1-1,5 m, and the thickness of humus-containing active layer is 50-70 cm. The soils are mainly characterized by loamy texture, with certain inclination of clay or light loamy and sandy texture in genesis horizons in exceptional cases. Besides, the mentioned soils differ by degree of skeletal texture and stone-formation. Skeletal texture and stone-formation are more obvious on the new river terraces and at the banks. The soils of the 8-th and 9-th varieties are characterized by excess moisture and bogging, which are mainly presented as small plots in lowered spots and along the channels. By texture, these soils are mostly clay and loamy soils.

For the first nine varieties of soils, pebble-beds and loamy and pebble-beds and sandy sediments of alluvial origin are the soil-forming rocks, which are mainly made up of the detritus drifted from the Southern slope of Caucasioni, which is mostly represented by the detritus of black slate of marine origin with a great capability of heat absorption and having certain influence on the soil temperature. This, on its turn, increases the sugar content in grape and improves the product quality.

The 10-14-th varieties of soils are talus, spread on loamy and loamy-sandy-detritus sediments of dealluvial-proalluvial origin. These soils are also characterized by great thickness of profile of 80-150 cm, and with the thickness of humus-containing active layer of 50-60 cm. The given varieties of these soils also differ from one another with texture, degree of skeletal texture, content of carbonates and moisture. The 10-th and 11-th varieties of soils are non-calcareous with loamy texture. The 11-th variety is characterized by skeletal texture. It is weakly skeletal, The 12-th, 13-th and 14-th varieties of soils are weakly calcareous, with clay and loamy textures. The 13-th variety is weakly skeletal, and the 14-th variety has excess moisture.

Following the results of the analysis, the mentioned soils by texture are mainly loamy. In exceptional cases, they are characterized by slight clay texture. The content of humus in them is average amounting to 5,5-2,5% in the active layer up to the depth of 50-70 cm, decreasing to 2,5-0,5% in the lower layers. The content of hydrolysis nitrogen is little or average amounting to 9,36-2,24 mg in 100 gr. of soil. The content of soluble phosphorus is mostly low and the substance is represented as a trace only. The content of exchange potassium is also low of 17,0-2,0 mg in 100 gr. of soil. The 1-st, 2-nd, 3-rd, 4-th, 8-th, 10-th and 11-th varieties of soils do not contain calcium

carbonates at all. The content of calcium carbonates is low in the 5-th, 6-th, 7-th, 9-th, 12-th, 13-th and 14-th varieties of soils and constitutes 0,2-5,0%. The reaction of soil area (pH) is neutral and weak alkaline with pH indicator within the limits of 5,8-7,6

The soil characteristics of the mentioned micro-zone, following the conducted studies, allow using the vine species Saperavi to produce the wine Kindzmarauli.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of appellation Kindzmarauli, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF SAPERAVI

Growing area: Up to 250-550 m above sea level

Plot of planting: 3,0 x 1,5 m; 2,5 x 1,25 m; 2,5 x 1,5 m

Height of stem: 70-90 cm

Form of pruning: Free and Georgian two-sided trellis

Norm of loading per 1 sq. m.: 8-10 buds; 80-100 thousand buds per hectare.

Harvest: 7-8 tons per hectare.

SOIL CULTIVATION

Autumn and spring ploughs of soil. Minimum soil cultivation. Moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching). Ending the vegetation irrigation one month before the vintage.

In dry land – on the slopes of average and great inclinations carrying out anti-erosion measures of mulching and zero soil cultivation, with grass-lawn system; soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, anthracnose, rots.

Pests: Ticks, the Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF SAPERAVI

Saperavi is Georgian red-grape wine species giving premium-quality production. In the given micro-zone the vine ripens in the second half of September, and the vintage continues up to the first half of October. The vine is stronger than average

grow. The average harvest is 7-8 tons per hectare. Sugar content of the ripe grape reaches up to 260 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3. It is not very sensitive to fungus diseases.

WINE KINDZMARAULI

Kindzmarauli – Controlled premium-quality, red natural semi-sweet wine of appellation of origin. It is produced with the grape species Saperavi.

Wine Kindzmarauli is characterized by dark pomegranate tint; it has harmonious taste, full velvet, piquant and pleasant sweetness, with fruit tones and species-specific aroma.

Chemical characteristics of the wine Kindzmarauli should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars of no more than 30-50 gr/dm^3

Titrated acidity – 5-7 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE TSINANDALI

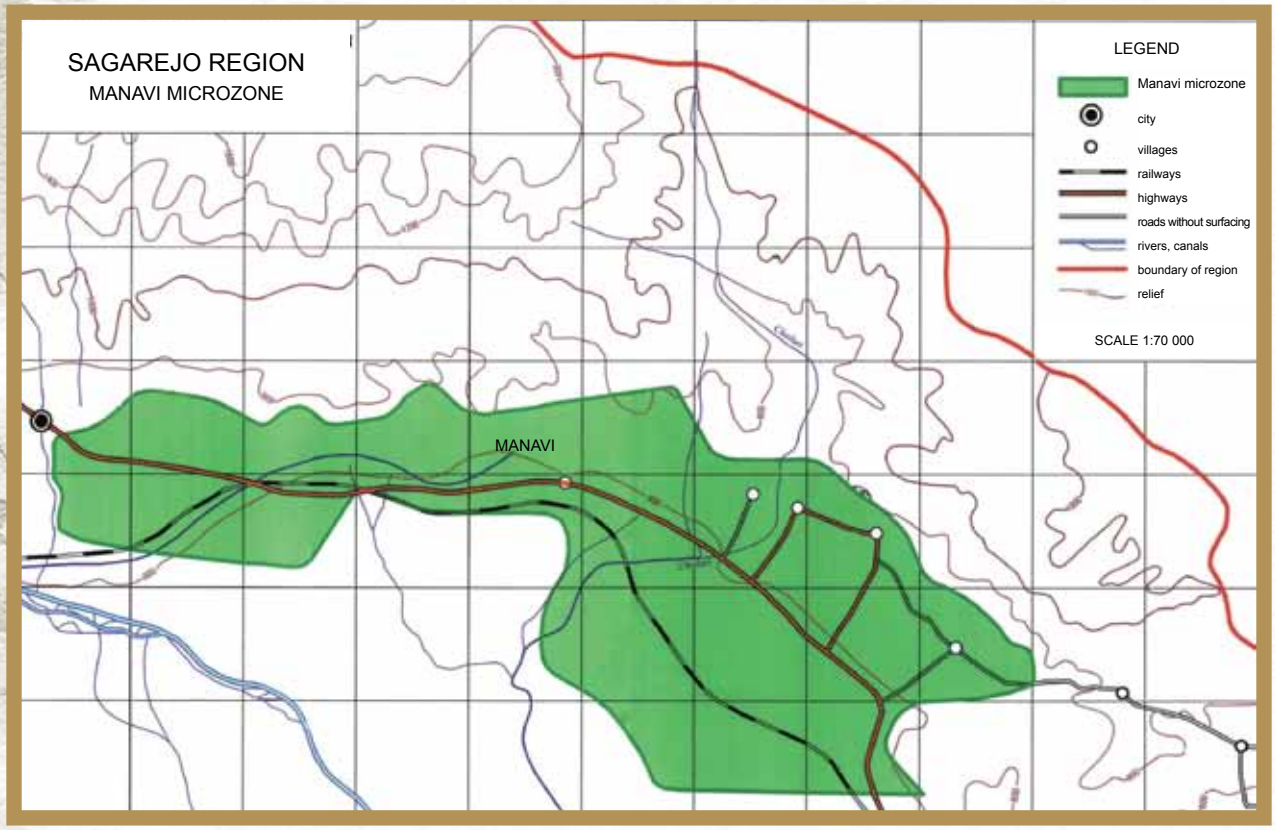
The area for raw material of the wine Tsinandali is 1633 ha, with 614 hectares of high-yielding area.

4297 tons of harvest is possible to produce in the micro-zone at present. At the output of 65 decalitres out of 1 ton, 280 000 decalitres of bulk wine may be produced.

The special location of Kindzamarauli micro-zone, the microclimate developed under the influence of foothills bordering the Caucasioni high mountains from the South, skeletal soils developed on the black slates drifted by the rivers, beneficial heat regime developed in the vineyard and unique properties of the wine species Saperavi, its ecological plasticity provide specific taste values of naturally semi-sweet wine Kindzmarauli.

Manavi

REG. №788 (21.08.2006)


SAGAREJO REGION
MANAVI MICROZONE
LEGEND
Manavi microzone
city
villages
railways
highways
roads without surfacing
rivers, canals
boundary of region
relief
SCALE 1:70 000
MANAVI

Appellation of Origin of "Manavi" Wine

GEOGRAPHICAL LOCATION

Micro-zone of Manavi is located in Outer Kakheti, administrative Region of Sagarejo, on the foothills of the Southern and adjacent slopes of Tsiv-Gombori Ridge, with the coordinates of the Northern latitude of 41°44' and the Eastern longitude of 45°27' and nearby. Industrial vineyards are mainly located at 450-800 m above sea level. Physical-geographical individuality of this part of Iori Upland is the result of its joint heightened-plain, wavy, slightly dissection relief and the location in the zone with the climate transient from Continental to Sea.

The micro-zone of the wine Manavi includes the following villages: Tokhliauri, Manavi, Burdiani, Giorgitsminda, Antoki, Mariamjvari, Didi Chailuri, Patara Chailuri, Kakabeti and Verkhviani.

CLIMATE

The climate is moderately damp here, with hot summer and moderately cold winter.

The annual duration of sunshine in vine-growing and wine-making micro-zone is 2100-2200 hours, with 1650 hours during the vegetation period. Total solar radiation is 120-130 kcal/cm^2, and the annual radiation balance is 50-52 kcal/cm^2.

In the micro-zone the average annual air temperature is 9-12°C. The warmest months are July and August, with their average temperature of 23,5-22°C, and that in Manavi, at 650 m height it is 23°C. The average temperature of the coldest month (January) varies from 0°C to 2°C, according to the above-mentioned altitudes.

The average of the annual absolute minimums of air temperature is -12 – -14°C. Once in every 10 years, the minimum temperature may drop to -17 – -19°C. Extreme temperatures are -25°C and +39°C.

A stable transition of air temperature above 10°C in most of the region takes place in the first decade of April, and the fall below 10°C takes place at the end of October. The duration of the vegetation period is 190-200 days. The sum of active temperatures from 450 to 800 m height varies between 3800°C and 3400°C. In the Micro-zone of Didi Zvari it is within the limits of 3650°C and 3450°C.

Cloudiness, according to the general level of cloudiness is 55-60%. Winter and spring are distinguished by more cloudiness (60-70%) with less cloudiness in summer (35-40%).

Annual sum of atmospheric precipitations in the micro-zone is 590-865 mm, with 400-600 mm in the vegetation period. The maximum amount of precipitations falls in May (90-130 mm), and its minimum is fixed in December (25-35 mm). Buds of Kakhuri Mtsvane and Rkatsiteli start blossoming from the second half of April (22.IV). The buds flower in the first decade of June and the grape ripens in the second half of August.

Flowering and ripening stages of Kakhuri Mtsvane take place three days earlier than in case of Rkatsiteli. In the micro-zone of Manavi, Kakhuri Mtsvane produces the best bulk wine if the grape is harvested at the end of September when the active heat is more than 3300°C. The number of such years here reaches 50%. As for other years, the good-quality wine is produced.

Average annual relative humidity of air is 69-70%. Air imbibition is the least in summer months July, August) and equals to 62-64% and is the greatest in late autumn and at the beginning of winter (76-79%).

The annual number of days with hail in the micro-zone is 0,9-2,6, according to the height above sea level. May has most days with hail (0,6-1,1 days).

On the territories designated for vineyards on the Southern foothills of Gombori Ridge and plains of the river Iori, winds of Western (25%), Eastern and South-eastern (16-17%) directions prevail in the micro-zone. Average annual wind speed is 2,2-2,6 m/sec. In the lowered zones, especially in spring the wind speed equals to 2,8-3,3 m/sec. Generally, the micro-zone belongs to the third group of wind adverse activity. The number of days with strong wind is no more than 19 per annum. Maximum speed of strong winds expected once in 20 years is 40 m/sec. Once in ten years, the wind speed may reach 36 m/sec. According to the adverse wind action, the micro-zone belongs to the I group of wind activity and therefore, the main windbreaks should be planted 200-250 m away.

SOILS

There were field morphological and laboratory studies of soils conducted, which envisaged the study of the soil profile from the surface including the mother rock, by morphological sings and physical-chemical properties by laboratory studies. For this purpose, the sections at different points of the micro-zone were made, according to the types and varieties of soils.

Based on the study, there are brown soils with sub-types and varieties and alluvial-proalluvial soils distinguished in the micro-zone, which can be classified as follows:

I. BROWN SOILS:

1. Dark brown (of Chernozem type) calcareous, of great thickness, with little humus, clay and heavy loamy soils developed on loessial clays;
2. Dark brown (of Chernozem type) calcareous, of great thickness, with deep layers of humus, weakly skeletal and stony here and there, clay and heavy loamy, developed on loessial clays and loamy conglomerates;
3. Dark brown (of Chernozem type) calcareous, of average thickness, with little humus, clay and heavy loamy, weakly skeletal and stony, developed on leossial clays and loamy conglomerates;
4. Ordinary brown, calcareous, of great thickness, with average and little content of humus, clay and heavy loamy, weakly skeletal and stony here and there, developed on loessial clays and loamy conglomerates.

II. MEADOW ALLUVIAL SOILS:

5. Brown meadow (old alluvial-dealluvial) calcareous, of great thickness, with average and little humus-content, heavy loamy and light clay, developed on alluvial-proalluvial deposits;

6. Brown meadow (old alluvial) calcareous, of great thickness, with little humus, clay and heavy loamy, developed on alluvial deposits.

III. ALLUVIAL-PROALLUVIAL SOILS:

7. Alluvial-proalluvial, calcareous, of great thickness, with average humus content, strongly skeletal and stony, loamy soil developed on alluvial-proalluvial deposits.

Dark brown (Chernozem type) soils, characterized by a great thickness of profile (varieties 1 and 2) are mainly spread in the upper part of the territories of Chailuri, Kakabeti, Verkhviani, Kandauri, Badiauri and Shibliani, between the village settlement and Tbilisi-Kakheti railway. Thickness of profile of these soils is 0,8-1,2 m, and the thickness of humus-containing active layer is 35-50 cm. Dark brown (Chernozem type) soil of average thickness (variety 3) is spread on the territories of Manavi (plot Zeiani) and Badiauri (plot Fermebtan). Thickness of profile of these soils is 50-70 cm, and the thickness of the humus-containing active layer is 35-40 cm. The soils of the first three varieties in the upper accumulation layer (A) are dark brown with blackish tint, brown or light brown in the transient layer (B) and of straw colour in the lower layers with whitish tint due to high content of carbonates or variegated with limestone pebbles.

Accumulation of carbonates in this layer is seen as light micelle. The soil structure in the accumulation layer is lumpy-cloddy; it is fine-cloddy or lumpy in the transient layer (metamorphous B) and without structure in the lower layers, is characterized by skeletal and stony texture here and there (varieties 2, 3). By structure, the soils are loose in the upper layer, dense and packed in the lower layers and are developed on the loessial clays and loamy conglomerates.

Meadow brown (old alluvial-dealluvial) soil (variety 5) is spread on the territory of the village Manavi and namely, on the plots Zvrebi and Mtsvane. Thickness of the profile of this soil is 1,5-2,0 m and the thickness of humus-containing active layer is 45-50 cm. It is characterized by brown colour in the accumulation layer (A), with light brown colour with straw tint in the lower layers. Development of genesis horizons is weakly expressed. The structure in the upper layers is cloddy-lumpy, with weakly expressed structure in the lower layers or without structure. At the depth of 80-100 cm, there is a fossil layer seen with a relatively light tint. The soil has loose structure in the upper layer and it is dense in the lower layers with heavy texture.

Meadow brown (old alluvial) calcareous of great thickness, heavy loamy and clay soils (variety 6) are mainly spread on the territory adjacent to the village Manavi, along the railway, on the lower side. Thickness of the profile of this soil is over 1,5-2,0 m and the thickness of humus-containing active layer is 50-60 cm. It is characterized by brown colour in the accumulation layer (A), with brown tint in the lower layers, with stain spots from the depth of 80-100 cm.

At the depth of 0-80 cm, the soil is characterized by cloddy and lumpy structure,

with no structure in the lower layers, or with weakly expressed structure. By texture, it is packed or loose and is characterized by clay or heavy loamy texture and humidity.

Alluvial-proalluvial soils (variety 7) are spread in the Northern part of Manavi, Tokhliauri, Chailuri and Sagarejo-Giorgitsminda, on the talus fans of Chailuri gorge, Matiantkhevi and Giorgitsminda gorge. They are characterized by great thickness of profiles and the thickness of humus-containing layer of 40-50 cm. They have fine-grain-cloddy structure in the upper layer and have no structure in the lower layers. They are loose, strongly skeletal and stony. They are developed on the stony-detritus and sandy sediments of talus fans.

The laboratory studies have established that brown and meadow brown (old alluvial-dealluvial and alluvial) soils (varieties 5 and 6) are mainly characterized by low content of humus of 3,5-1,5% in the active layer. This indicator sharply decreases in the lower layers. The exception is the soil of the second variety (plot Khodabunebi and Samkali Mitsa in the village of Kakabeti), where the content of humus even in deeper layers (100-120 cm) approximates to the upper active layer and amounts to 2,9-1,6%. The content of general nitrogen almost corresponds to that of humus and constitutes 0,238-0,070%.

The exception is the section №9 (village Kakabeti, plot Samkali Mitsa), where its content is high reaches 0,980% in the layer of the depth of 0-20 cm. Similarly, ordinary brown soils (variety 4) are an exception with the general content of nitrogen more in the lower layers (0,980-0,602% at the depth of 50-100 cm) than in the upper layers what is an irregular event.

The content of hydrolysis nitrogen in the upper layer, at the depth of 0-60 cm is 11,70-5,60 mg in 100 gr of soil what is an average indicator decreasing in the lower layers what is a regular process.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the wine of appellation Manavis Mtsvane, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF KAKHURI MTSVANE

Growing area: Up to 400–800 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m; seldom at 3,0 x 1,5 m
Height of stem: 60-100 cm
Form of pruning: Free and Georgian two-sided trellis, rarely cordons
Norm of loading per 1 sq. m.: 8-10 buds; 80-100 thousand buds per hectare
Harvest: 6-7 tons per hectare.

SPECIES OF RKATSITELI

Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m; seldom at 3,0 x 1,5 m
Height of stem: 70-100 cm
Form of pruning: Free and Georgian two-sided trellis

Norm of loading per 1 sq. m.: 8-10 buds, 80-100 thousand buds per hectare
Harvest: 9-10 tons per hectare.

SOIL CULTIVATION

In the irrigation land – soil cultivation according to the agricultural regulations with autumn and spring ploughs. Cultivation for 4 or 5 times. Moisture-preservation measures – preservation of soil surface in a loose state (cultivation, milling, mulching). The last vegetation irrigation in the irrigation area should be ended one month before the vintage

In dry land – anti-erosion measures on the slopes with average inclination: minimal and zero soil cultivation; grass-lawn system, soil mulching as it appears possible.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Particular inclination to mildew; powdery mildew, rots.
Pests: Ticks, Western grape warm, mealybug.

Pest and disease control measures: Additional measures against powdery mildew by using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF KAKHURI MTSVANE AND RKATSITELI

KAKHURI MTSVANE

Kakhuri Mtsvane – Georgian white vine species.

The vine is of average grow and of average ripening period. The average weight of its bunches is 172 gr and the average harvest is 5-8 tons per hectare. The species has great capability of accumulating sugar (200-220 gr/dm^3 with the preservation of permanent acidity of 6,0-7,8 gr/dm^3). It is sensitive to powdery mildew.

RKATSITELI

Rkatsiteli – Wine species of white grape. It is distinguished by high economic-technological properties, resistance in various conditions and high dignity of production. The species is of average or late period. It is characterized with abundant harvest (average weight of a bunch is about 160-250 gr). Average harvest is 9-10 tons per hectare.

Sugar content of the grape is 240 gr/dm^3 with the preservation of permanent acidity of 7,8 gr/dm^3.

MANAVI

Manavi – Controlled premium-quality, white dry wine of appellation of origin. The vintage to produce the wine Manavi is held when the sugar content of the grape is 190 gr/dm^3 and the titrated acidity is 5,5-7,5 gr/dm^3.

Wine Manavi is controlled premium-quality white dry wine of appellation of origin It is made of the grapes species of Kakhuri Mtsvane and 15% of Rkatsiteli may also be used.

Wine Manavi is characterized with light straw to straw colour, with greenish tint, with delicate, harmonious, gay and elaborate taste, fruit aroma and species-specific aroma and developed race.

Chemical properties of the wine Manavi should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Titrated acidity – 5-7 gr/dm^3

Volatile acids of no more than 1 gr/dm^3

Mass sugar concentration of no more than 0,3 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

Concentration of total mass of sulphuric acid of no more than 210 gr/dm^3

Concentration of free sulphuric acid of no more than 30 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AVAILABLE AREAS FOR RAW MATERIALS OF WINE

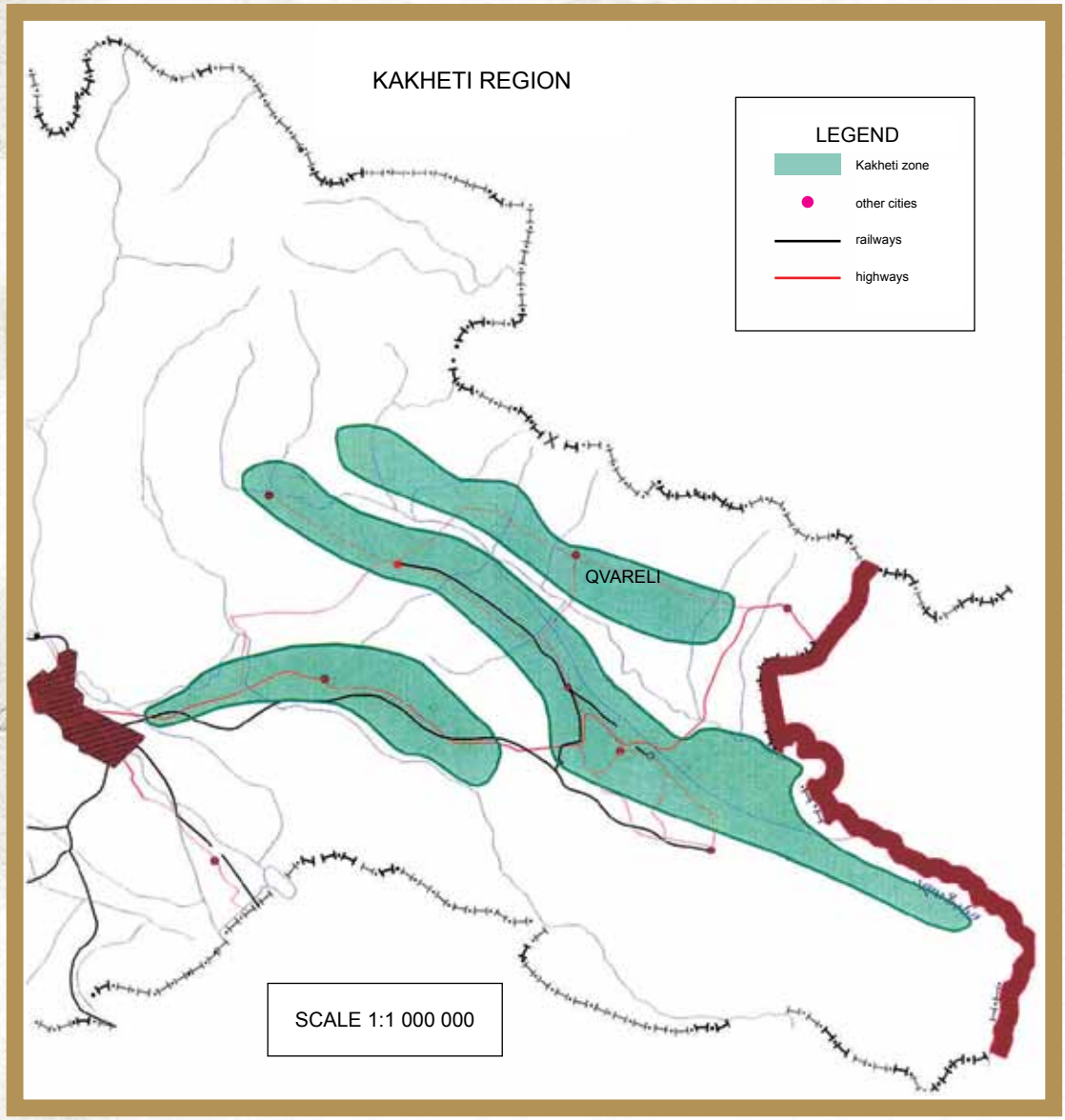
The areas for raw material in the micro-zone of the wine Manavi is approximately 346 ha.

The expected volume of conditional harvest is 2425 tons. At the output of 65 decalitres out of 1 ton, 157 000 decalitres of bulk wine may be produced.

The geographical location of the micro-zone of Manavi, elevated-plain slightly dissection relief of Iori Upland, transitional climate from subtropical to moderately humid subtropical, dark brown calcareous soils (of Chernozem type)and special features of the species Manavi make for peculiar values of wine Manavi.

Kakheti

REG. №789 (10.12.2007)


KAKHETI REGION
LEGEND
Kakheti zone
other cities
railways
highways
QVARELI
SCALE 1:1 000 000

Appellation of Origin of "Kakheti" Wine

GEOGRAPHICAL LOCATION

Kakheti is located in the South-eastern part of Georgia, in the basin of the rivers Alazani and Iori and occupies 11,300 square kilometres of area. Its coordinates are: the Northern latitude of 41-42°15' and the Eastern longitude of 45-46°30'. To the North-east, Kakheti is bordered by the main Ridge of Caucasioni, Kartli Ridge from the West and Azerbaijan from the South-east.

Tsiv-Gombori Ridge divides Kakheti into two parts, Inner Kakheti and outer Kakheti.

Inner Kakheti is a gradual slope of the above-mentioned ridges transforming into Alazani Valley – the largest valley in Georgia. Alazani Valley is located on both sides of the river Alazani and its length is about 160 km, width varies from 5 to 40 km. Its altitude above sea level is 740 m in the North-western direction, which decreases in the South-western direction to 200 m, at the border with Azerbaijan. The relief of Alazani Valley is uneven and by the erosive action of mountain rivers flowing down the main Ridge of Caucasioni the mountain slopes and their foots are quire dissection.

Outer Kakheti or Iori Upland is located between Samgori upland and Tsiv-Gombori Ridge and is directed towards the East, where the main water artery of Kakhetian water flows – the river Iori. Diversified relief of Kakheti is blends with diversified climatic conditions.

CLIMATE

Three agro-climatic zones are distinguished subtropical, warm and moderately warm. According to the indicator of climatic specificity, the region is divided into fifteen sub-regions.

Climatic conditions of Kakheti promote high-qualitative wine-making. Total annual amount of precipitations is 600-800 mm. The duration of the vegetation period is 210 days with the average temperature of 18,5°C. Hail causing significant damage to some or other region of Kakheti is mostly expected in spring and autumn. During the second half of spring long droughty periods may be seen. Winter is moderately cold and cloudy with little snow. Long frosts (-18 – -20°C), what damage the vine are rare. In general, the existence of vine culture in Kakheti is possible without burying and irrigation.

SOILS

Vine-growing in Outer Kakheti is spread at the Southern-western foot of Tsiv-Gombori mountain and in the belt located between the left and partially the right terraces of the river Iori, located at 450-700 m above sea level and including the villages of Sagarejo Region Khashmi, Patardzeuli, Ninotsminda and Sagarejo itself, Gareji, Giorgitsminda, Tokhliauri, Manavi, Chailuri, Kakabeti, Verkhviani, Dabiauri, territories

of Iormughanlo, Kandaura and Shibliani, and partially the villages of Gurjaani Region Kachreti, Jimiti, Melaani, Arashenda, Chalaubani and villages of Signagi Region - Nukriani, Zemo and Kvemo Bodbe, territories of Magaro, villages of Gardabani Region – Samgori, Varketili, Martkopi, Gamarjveba and the territory of Sartichala.

Outer Kakheti has mainly brown-soil and brownish soils spread, with their varieties. Brown meadow soils with a number of varieties also occupy a significant place. Alluvial-proalluvial and dealluvial soils with their varieties are less spread.

The above-mentioned soils differ from one another by morphological signs and physical and chemical properties. Thickness of profile of brown, brownish, brown meadow soils varies within the limits of 50-120 cm, and that of the humus-containing layer varies within the limits of 30-60 cm. The soils are mainly characterized by clay and heavy loamy soils by texture. The content of humus in the active layer of these soils mainly varies between 2-4%, gradually decreasing in the lower layers. The soils contain carbonates in small and average quantities of 2,5-25% increasing in the upper layers. The reaction of the soil area is average and weak alkaline and pH indicator is mainly within the limits of 7,3-8,2

Alluvial-proalluvial and dealluvial soils in the vine-growing zone of Outer Kakheti are spread on relatively less areas, mostly along the gorges and lower belt of the mountain slopes. Thickness of the profile of these soils exceed 1 meter, and that of active humus-containing layer is 30-50 cm. The soils are mainly characterized by loamy and heavy loamy texture, by skeletal and stony structure here and there. The average of carbonates is alkaline and pH indicator is 7,5-8,3. The content of humus in these soils varies mainly within the limits of 1,5-2,55.

The zone of Inner Kakheti includes the territories of Gurjaani, Telavi, Akhmeta, Kvareli and partially the territories of Signagi, Tsitelskaro and Lagodekhi Regions, spread on the right and left sides of the river Alazani and representing its second terrace and the foots of the North-eastern and the North-western slopes of Tsiv-Gombori mountains. The zone is located between the foots of the Southern slopes of Caucasioni Mountains and foots of the North-eastern and the North-western slopes of Tsiv-Gombori mountains, at 350-750 m above sea level.

On the right side of the Alazani, in Inner Kakheti, there are brown, brown meadow, Chernozem, brownish, alluvial-proalluvial and dealluvial soils with their varieties spread.

Thickness of profile of brown, Chernozem and brownish soils varies within the limits of 60-120 cm, and that of the humus-containing active layer varies within the limits of 30-60 cm. The soils are mainly characterized by clay and heavy loamy texture. They are characterized by skeletal and stony structure here and there, with average and little content of carbonates. The reaction of the soil area is average and weak alkaline and pH indicator is mainly within the limits of 7,2-8,2. The content of humus in the active soil layer is mainly 2,0-4,0% gradually decreasing in the lower layers.

Alluvial-proalluvial and dealluvial soils are represented on the both sides of the river Alazani. Thickness of the profile of these soils exceeds 1-1,5 meters, and that of the humus-containing active layer is within the limits of 40-60 cm. They are mainly

characterized by loamy and heavy loamy texture, with light loamy and sandy textures in some sections. The content of humus in the active soil layer is mainly 1,5-2,5% gradually decreasing in the lower layers. Alluvial-proalluvial and dealluvial soils spread on the right side of the Alazani contain carbonates mainly on average and little amounts (4,5-25,0%), and the same soils spread on the left side of the Alazani do not contain carbonates, or contain them in insignificant amounts (0,5-2%). The reaction of the soil area pH for the soils spread on the right bank of the Alazani is 7,3-8,2, and for the soils on the left bank of the Alazani is 6,2-7,0.

AGRO-TECHNOLOGICAL REGULATIONS

The following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SPECIES OF KAKHURI MTSVANE

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 6-7 tons per hectare.

SOIL CULTIVATION

Autumn and spring plough of soil.
Minimal soil cultivation.
Moisture-preservation measures – preserving the soil surface in loose state (cultivation, milling, mulching).

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations and ecological resources of the given location.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rots.
Pests: Ticks, thr Western grape warm, mealybug.
Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES

RKATSITELI

Wine species of white vine. It is distinguished for high economic-technological properties, good resistance in various conditions and high dignity of production. It is of average or later than average ripening period; a high-yielding species (average weight of the bunch is up to 160-250 gr.). The average harvest is 9-10 tons per hectare.

The sugar content in the ripe grape is 220-240 gr/dm^3, with the permanent acidity of 5-6 gr/dm^3.

KAKHURI MTSVANE

Georgian white vine species giving high-quality product.

It completely ripens at the end of September.

Its bunch is of average size with the average weight of 160-175 gr. Ripe bunch is of green-yellowish color and has a very pleasant species-specific aroma. The content of sugar in the ripe grape is 200-220 gr/dm^3, with 6-7 gr/dm^3 of acidity. Average harvest to produce high-quality wine is 7-8 tons per hectare.

WINE KAKHETI

Wine Kakheti is dry white wine of appellation of origin. It is produced with the grape of species Rkatsiteli and Mtsvane with fully stopped must.

Wine Kakheti is characterized with amber color, fruit aroma, pleasant astringency, velvety and harmonicity.

Chemical characteristics of the wine Kakheti should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-13,5

Mass concentration of sugars of no more than 4 gr/dm^3

Titrated acidity – 5-6 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 18 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

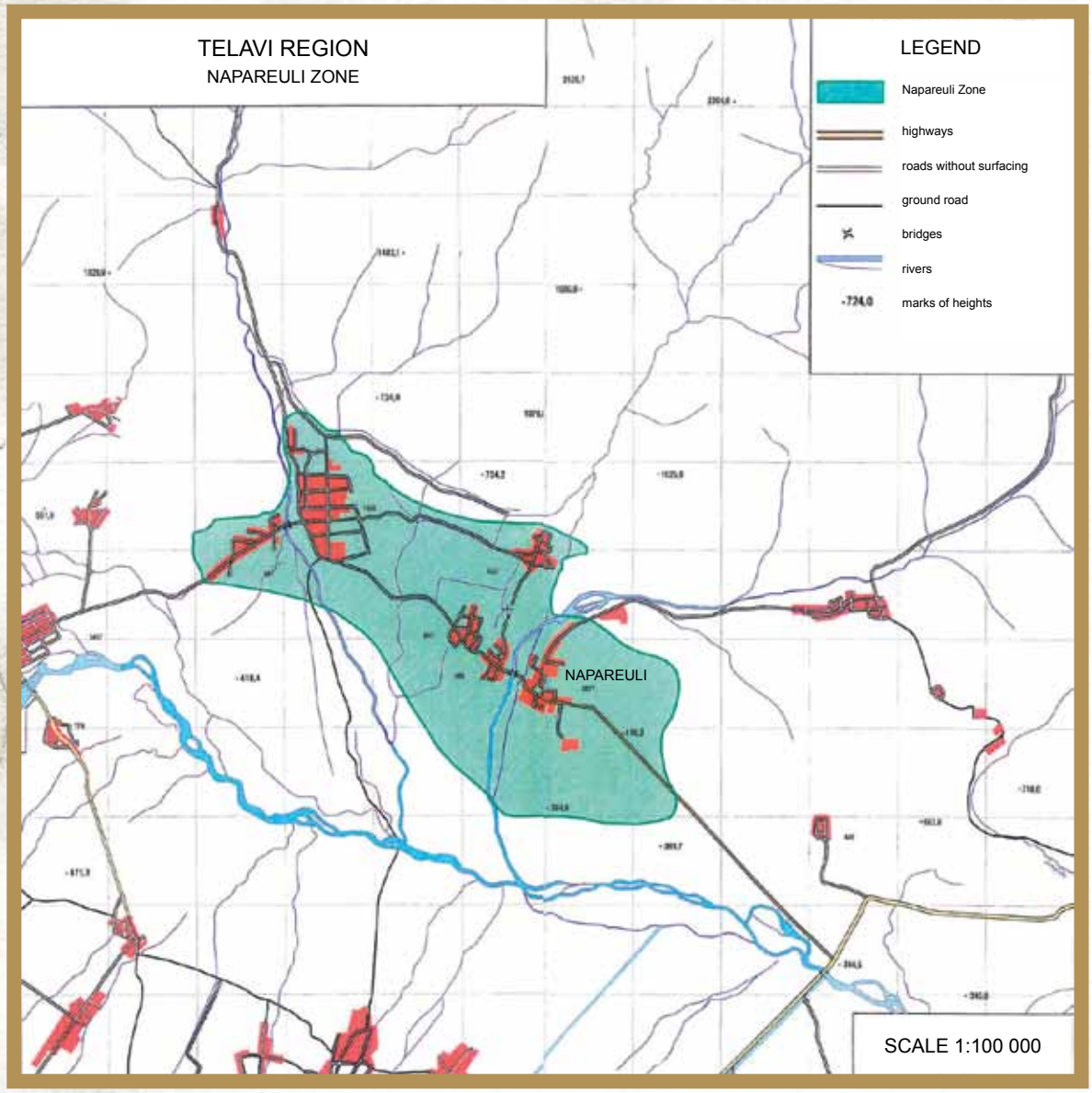
AREA OF SPECIFIC ZONES

The area of the specific zone of Kakheti is approximately 3100 sq. km.

The local ecological environment and the universality of the local indigenous species make for the originality and high quality of Kakheti wines.

Napareuli

REG. №790 (10.12.2007)


TELAVI REGION
NAPAREULI ZONE
LEGEND
Napareuli Zone
highways
roads without surfacing
ground road
bridges
rivers
marks of heights
NAPAREULI
SCALE 1:100 000

Appellation of Origin of "Napareuli" Wine

GEOGRAPHICAL LOCATION

The specific zone of Napareuli is located in the upper stream of the river Alazani, on its left bank, Kakheti region. The areas to be cultivated are located in the lower streams of the gorges of the left tributaries of the river Alazani, Stori and Didkhev-Lopota flowing from the Southern part of the Caucasioni.

The areas for vineyards are located at 400-500 m above sea level. The total width of Kakheti valley along Napareuli longitude is approximately 20 km.

The inclination of the areas for vineyards on the Southern slopes of the mountainous system of Caucasioni varies between 3 and 5°. The specific zone of Napareuli has the coordinates of the North latitude 42°03' and the East longitude 45°31'. It includes the villages of Napareuli, Saniore, Jugaani, Artana, Pshaveli and Laliskuri.

CLIMATE

The specific zone is characterized by moderately humid climate, with moderately cold winter and hot summer and double annual falling of precipitations. The peculiarity of the local climate is mainly stipulated by the relief conditions and characteristic circular processes.

On the left side of the river Alazani, as a result of great cloudiness of the dome of the sky, the annual duration of sunshine is less than that on the right bank of the river and equals to 2050 hours. This indicator during the vine vegetation period does not exceed 1500 hours. The ratio between the factual indicator of sunshine to its possible amount in summer and September is 63% on average. The principal component of heat balance of location – direct solar radiation on the surface perpendicular to the sunrays is 120-130 kcal/cm^2, and on the horizontal surface is 70-75 kcal/cm^2. The annual radiation balance is 52-54 kcal/cm^2. The number of clear days (with general cloudiness) is 48 per annum, and that on the lower stage, according to the cloudiness is 89. In summer the number of clear days, by considering the cloudiness of general and lower stages, is 16 and 23, respectively and not more than 15 and 16 days during the grape ripening period.

Average annual air temperature is 12,4°C. Average temperature of the coldest month (January) is +0,5°C, and that of the warmest months (July-August) is 23,7-23,4°C. The average of annual absolute minimums of air temperature is -13°, and the absolute minimum is -24°C. The average of annual maximums of air temperature is 36°C, and the absolute maximum reaches 39°C.

A stable transition above 10°C of air temperature takes place in April (5.IV), and the temperature fall below the mentioned point takes place in November (2.XI).

Average multi-year indicator of total active temperatures is 3920°C. In various years, total heat may vary between 3600°C (95%) and 4170°C (10%).

Average multi-year sum of atmospheric precipitations is 845 mm, with 630 mm in the vegetation period. Most precipitations fall in May (132 mm) and June (112 mm). During the grape ripening period August-Seotember, the average precipitation level is 145 mm. Hydrothermic coefficient during this period is 1,0 and 1,3. Therefore, the grape ripening period, except some cases, is provided with sufficient humidity. In August in some years, there is lack of humidity.

Most precipitations fall in spring (34%) and summer (32%), with less precipitations in autumn (22%) and winter (12%).

Average annual relative air humidity is 74%. This indicator falls to 71% in the vegetation period what is very close to the favourable norm (70%) for the vine biological phases. Humidity is the greatest by the end of autumn and at the beginning of winter (82%). It is relatively less (66-67%) in the second half of summer.

Summary indicator of active temperatures (4000°C) is expected here once in every four years (25%).

The first night frosts in autumn start on November the 11-th, on average. Once in every 10 years, the first frosts may start on October the 16-th.

The last spring night frosts end at the end of March on average. Once in every 10 years, the spring frosts may last until the middle of April.

The number of days with hail in the year is 1,6. The period from March through October is characterized with hail. Hail is most frequent in June (0,5 days) and in May (0,3 days). In the years with most hail, about 5 days with hail a year are expected here.

The average of annual absolute minimums of air temperature is -13°C. This indicator on the territories protected against the cold air masses is no more than -11, -12°C. It is -13°C in case of average minimum.

In most years (77%), the snow cover is instable. Snow cover is formed in the third decade of December and disappears at the beginning of March. Average number of snowy days is 26.

Average annual temperature on the surface of alluvial soil is 14°C. In the warmest months (July-August), the average temperature of soil surface reaches 29-28°C. In the cold month (January) it is no less than 0°C. Average maximum temperature of August is 48°C. Average minimum temperature in winter months is -4 – -6°C. In the 1-meter-deep layer of soil a stable transformation of the temperature above 10°C takes place from the 27-th of April.

On Alazani plain directed from North-west to South-east, the winds from Western (23%), Eastern and South-eastern (16-17%) directions prevail. They are sometimes changed for the winds of the Northern (17%) direction.

Average annual wind speed is 1,9 m/sec. Wind speed during the year is greater in spring and at the beginning of summer (2,1-2,4 m/sec). The winds of the least speed (1,3 m/sec) blow in December. The number of days with strong winds (≥15 m/sec) is 9 a year on average, with the maximum number of 39.

According to the above-mentioned data, the specific zone belongs to the III group of wind impact.

SOILS

In the North, the specific zone borders the foot of the Southern slope of Caucasioni, and in the South, it borders the first left terrace of the river Alazani. In respect of relief, its main area is represented by plains slightly inclined in Southern and South-western directions and by slightly inclined aprons. The main part of the mentioned territory is represented by the areas occupied with vineyards, the areas of former vineyards and arable lands. The territory spreads on the second left terrace of the river Alazani and on the right and left terraces of the rivers Lopota and Stori, the tributaries of the Alazani.

In geographic respect, the mentioned territory is structured with the deposited rocks of the Quaternary and later period, which mainly include the pebble-bed-loamy and pebble-bed-sandy sediments drifted by the river Alazani and the rivers Lopota and Stori and are soil-forming rocks.

The following varieties of alluvial and dealluvial soils are mainly spread here:

1. Alluvial-calcareous of great thickness, heavy loamy;
2. Alluvial, non-calcareous of great thickness, light clay and heavy loamy;
3. Alluvial, non-calcareous of great thickness, light and average loamy;
4. Alluvial, non-calcareous of great thickness, slightly skeletal, sandy;
5. Alluvial, non-calcareous of great thickness, strongly skeletal, sandy;
6. Dealluvial-calcareous of great thickness, heavy loamy and clay;
7. Dealluvial non-calcareous of average and great thickness, skeletal, heavy loamy;
8. Dealluvial non-calcareous, of great thickness, with the depth of up to 100 cm, skeletal, light clay and heavy loamy.

According to morphological signs, alluvial soils are brownish-greyish in colour in upper layers, with more greyish in lower layers. By structure, it is lumpy-cloddy and cloddy-granular weakly expressed in deep layers, particularly in the soils of the 4-th and 5-th varieties. By texture, the first and second varieties of soils are heavy loamy and light clay. The third variety is average and light loamy soils. The 4-th and 5-th varieties of soils are sandy soils by their texture. By structure, the first and second varieties of the soil are dense and packed soils, and the soils of the third variety are loose-like. The soils of the 4-th and 5-th varieties are characterized by loose structure. Besides, the soils of the 4-th and 5-th varieties are characterized by skeletal texture. Unlike them, the soils of the first variety is characterized by calcareous content, and the soils of the second-fifth groups are non-calcareous ones.

Dealluvial soils (varieties 6, 7 and 8) are brownish in colour, with lumpy-cloddy structure, with loose structure in the arable layer and dense in the lower layers. According to texture, the soils of the 6-th and 7-th groups are clay and heavy loamy soils, and the sixth variety is light clay and heavy loamy soil. The soil of the sixth variety are calcareous unlike those of the seventh and eighth varieties, which are non-calcareous.

In the profile of the mentioned soils the proportion of humus varies between 3,0-0,5%, and that in the active layer is 3,0-1,0%. Hydrolysis nitrogen is included in little and average quantities and varies mainly between 6,5-2,5 in 100 mg. of the active layer

of the soil. The content of exchange potassium is also low mainly in alluvial soils and constitutes 8,5-1,5 mg in 100 gr. of soil. In some cases it is expressed as a trace. The content of exchange potassium in alluvial soils is also low constituting 16,03,0 mg in 100 gr. of soil. In exceptional cases (in dealluvial soils) its content is quite high and reaches about 32,0-59,0 mg in 100 gr. of soil. Carbonates are contained in little quantities in the soils of the first and sixth varieties at 12,8-0,8%. Other varieties of soils do not contain carbonates at all. The reaction of the soil area (pH) in calcareous soils is weak and average alkaline and pH indicator equals to 7,3-8,2. Other varieties of soils are characterized by neutral or weak alkaline reaction and the indicator pH varies within the limits of 6,4-7,2. The sum of the absorbed bases (Ca+Mg) varies in wide range according to different types of soils and is within the limits of 6,05-41-21 milliequivalents in 100 gr of soil. A great proportion of the sum is absorbed calcium; as for manganese, its content is little.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the wine of Napareuli, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SPECIES OF SAPERAVI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 7-8 tons per hectare

An urgent agricultural measure: Rationing of the high-yielding tillers and tearing off their tips before the flowering phase.

SOIL CULTIVATION

Autumn and spring plough of soil. Moisture-preservation measures– preserving the soil surface in a loose state (cultivation, milling, mulching). The vegetation irrigation is to be ended one month before the vintage starts.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES RKATSITELI AND SAPERAVI

RKATSITELI

Wine species of white vine with favorable farming and technological properties. It is characterized by good resistance to various conditions and high dignity of production. The species is of average or later than average period. It is high-yielding (with an average weight of the bunch of up to 160-250 gr.). Average harvest per hectare is 9-10 tons.

The sugar content in ripen production is 220-240 gr/dm^3, with the acidity of 5-6 gr/dm^3.

SAPERAVI

Georgian color-grape wine species giving high-quality production. Wine made of Saperavi is of intense dark red color, with moderate content of alcohol and acidity, with rich and gay race and high taste properties.

The bunch is larger than average with the weight of 140-145 gr. The ripe bunch is of dark blue color, juicy and pulpy with pleasant sweet taste.

The grape ripens in the second half of September. The vine is stronger than of average grow. The harvest per hectare to gain the conditional production varies between 7-8 tons.

Sugar content of the ripe grape reaches 200–260 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3.

WINE NAPAREULI (RED)

Wine Napareuli is premium-quality controlled dry red wine of appellation of origin. It is produced with the grape of species Saperavi with fully stopped must.

Wine Napareuli is characterized with dark red color, with pure species-specific aroma, spicy, harmonious and developed race.

Chemical characteristics of the wine Napareuli should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,5-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

WINE NAPAREULI (WHITE)

Wine Napareuli is premium-quality controlled dry white wine of appellation of origin. It is produced with the grape of species Rkatsiteli with fully stopped must.

Wine Napareuli is characterized with light straw colour, with pleasant and specific

aroma and taste, developed race and tones of meadow flowers.

Chemical characteristics of the wine Napareuli should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,5-7,5 gr/dm^3

Volatile acidity of no more than 1 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

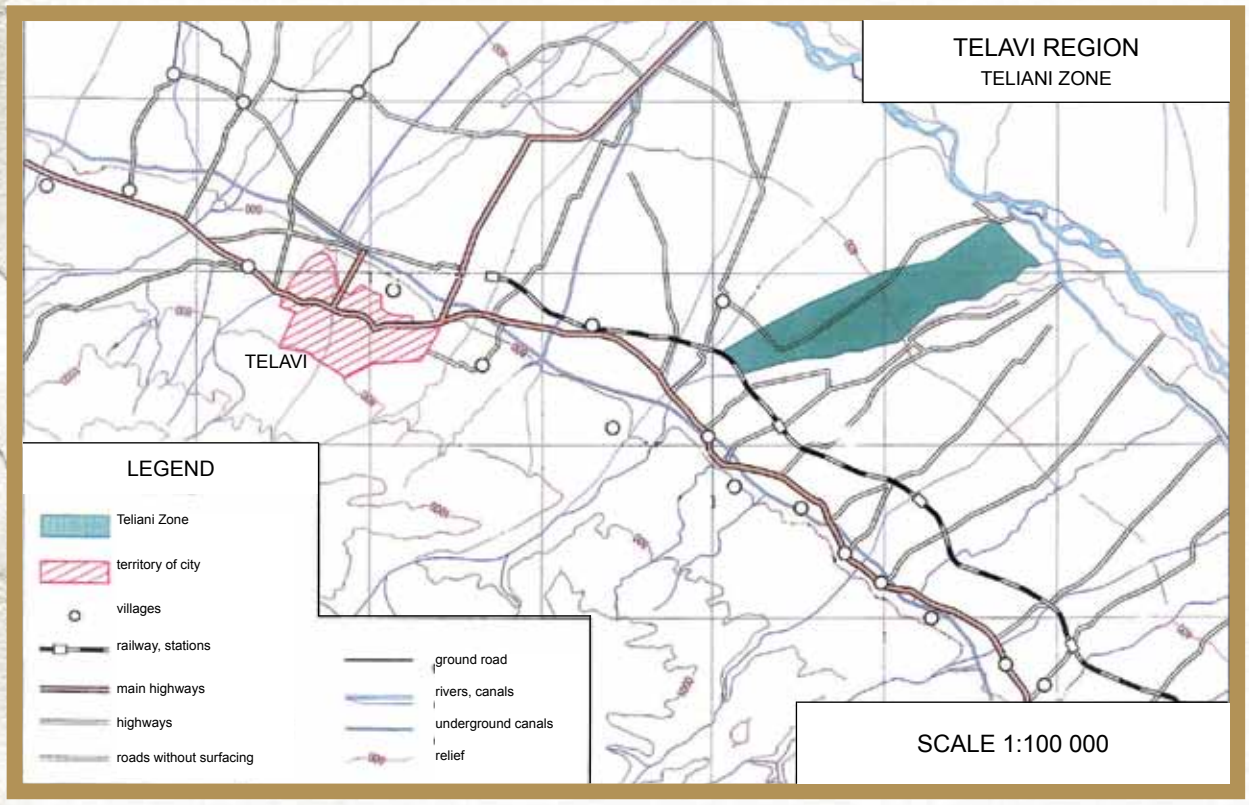
AREA OF SPECIFIC ZONES

The area of the specific zone of Napareuli is approximately 52 sq. km.

Unique properties of local species, the micro-climate formed under the influence of the gorges of the rivers Stori and Didkhev-Lopota, flowing down the Southern slopes of the Caucasioni, soil varieties and structure make for the peculiarity of the wine Napareuli.

Teliani

REG. №791 (10.12.2007)


TELAVI REGION
TELIANI ZONE
TELAVI
LEGEND
Teliani Zone
territory of city
villages
railway, stations
main highways
highways
roads without surfacing
ground road
rivers, canals
underground canals
relief
SCALE 1:100 000

Appellation of Origin of "Teliani" Wine

GEOGRAPHICAL LOCATION

The specific zone of Teliani is located in the middle stream of the river Alazani, with the coordinates of the North latitude 41°54' and the East longitude 45°35'. The areas for vineyards are spread on the North-eastern slopes of Tsiv-Gombori mountains and are located between the Kisiskhevi and Vantiskhevi, the right tributaries of the river Alazani, at 560 m above sea level.

CLIMATE

The climate of the specific zone is moderately humid, with hot summer and moderately cold winter. Annual duration of the sunshine is up to 2300 hours, with 1660 hours in the vegetation period. The direct solar radiation on the horizontal surface is 75 kcal/cm^2 per annum, the dissipated radiation is 52,4 kcal/cm^2, and the total solar radiation is 130 kcal/cm^2 per annum.

Ratio of the factual amount of sunshine with its possible amount in summer months and in September is 66% on average. The number of clear days during the grape ripening period is 17-19.

Average annual air temperature is 12,1°C. Average temperatures of the warmest months of July and August are almost the same and constitute 23,2-22,9°C, and the average temperature of the coldest month (January) is +0,9°C. Average of annual absolute minimums of air temperature is -11°C. The absolute minimum is -23°C. The average of annual absolute maximums of air temperature is +35°C, and the absolute maximum is +38°C.

The daily amplitude of air temperature is the highest (8-9,5°C) in summer months and is the lowest (4,8-5,5°C) in winter.

Total amount of heat strongly varies in different years. During the last century, in Tsinandali the sum of heat above 10°C varied from 3300°C to 4250°C. Multi-year amplitude of the sum of heat reaches 950°C.

Accumulation of total heat over 3500°C is the case in 95% of the years, i.e. almost every year.

The first autumn night frosts start on average from November (26.XI). Once in every 10 years, the first night frosts may take place at the end of October. Thus, the vine is not endangered by autumn night frosts.

The total average multi-year amount of precipitations is 845 mm., with 644 mm in the vegetation period. Maximum precipitations fall in May (157 mm) and in June (111 mm). The average total amount of precipitations during the grape-ripening period August-September (VIII-IX) is 144 mm. Out of the total amount of precipitations, most of them fall in spring (34%) and summer (31%), and a little less in autumn (23%) and winter (12%).

Average annual relative air humidity is 70%.

The number of the days with hail is great and equals to 2,3 a year on average. Most often it hails in May and June (0,7-0,8 days). In the exceptional years, characteristic with enormous amount of hail, the days with hail may amount to 9.

The Western (30%) and the Eastern (24%) winds prevail, with the winds of the Southern-western (14%), the Northern-western (11%) and the Southern-eastern (10%) directions of less frequency.

Average annual wind speed is 1,7 m/sec. During the year, the wind speed is greater in spring and summer (1,7-2,1 m/sec) and is the least in winter months (1,3-1,5 m/sec). The number of days with strong winds (≥15 m/sec) is not great on average and equals to 10.

The specific zone belongs to the III group of wind impact and 4-row windbreaks are recommended to be planted in such places.

The number of snowy days in the specific zone is 33 on average.

SOILS

The soils are represented by a variety of brown meadow (old alluvial) and alluvial soils differing from one another with the degree of skeleton-structure and texture. Brown meadow alluvial soils (old alluvial soils) are spread at the foot of the Northern-eastern slopes of Tsiv-Gombori mountains, and alluvial soils are spread on the second right terrace of the river Alazani.

There are two varieties of meadow brown (old alluvial) soil and two varieties of alluvial soils spread here:

1. Brown meadow (old alluvial) of great thickness, loamy;
2. Brown meadow (old alluvial) of great thickness, skeleton, clay;
3. Alluvial-calcareous of great thickness, loamy;
4. Alluvial-calcareous of great thickness, skeletal, loamy.

The first two varieties of the above-mentioned soils are spread in the upper belt of the micro-zone, at the foots of the North-eastern slopes of Tsiv-Gombori mountains and on slightly inclined aprons and plains, and the third and the fourth varieties are spread on the second right terrace of the river Alazani, adjacent to the foots of the North-eastern slopes of Tsiv-Gombori mountains and is a plain with a wave-like surface slightly inclined in South-eastern direction. In the above-mentioned four types of soils the thickness of profile exceeds 1-1,5 m, and the thickness of active humus-containing layer varies between 50-60 cm. According to their texture, the mentioned soils belong to the loamy group with the content of physical clay of 25-50%. In the lower layers of some sections, they are slightly inclined to light loamy or sandy soils. The content of humus in the active layer of soil is less than average equalling to 1,5-3,0%, even more decreasing in the lower layers. The content of calcium carbonate is average amounting to 5-15%. The reaction of the soil solution (pH) is mainly alkaline and the indicator of pH varies between 7,4-8,0. The soils contain hydrolysis nitrogen in little and average amounts reaching 5,0-8,5 mg in 100 gr. of soil in its chemical layer. The same indicator is even lower in the lower layer of soil. The content of soluble phosphorus in the active layer of the soil is average and amounts to 2,5-3,0 mg in

100 gr of soil, and the same indicator is even lower in the lower layers of soil. The soils are generally poor in exchange potassium constituting at most 12,0 mg in 100 gr of soil.

AGRO-TECHNICAL REGULATIONS

In order to produce the wine of Teliani, the following agro-technical regulations should be observed by considering the soil and climatic conditions.

SPECIES OF CABERNET-SAUVIGNON

Growing area: Up to 560 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Georgian two-sided, free
Norm of loading per 1 sq. m.: 7-8 buds
Harvest: 6-7 tons per hectare.

SOIL CULTIVATION

Autumn and spring plough of soil. Preserving the soil surface in a loose state (cultivation, milling, mulching). The last vegetation irrigation is to be ended one month before the vintage starts.

In dry land – preserving the soil surface in weed-free and a loose state. Soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATION

Principal diseases: Mildew, powdery mildew.

Pests: Ticks, mealybug.

Control measures: Applying contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF CABERNET-SAUVIGNON

CABERNET-SAUVIGNON

High-quality French wine species of red color vine. The red wine made with Cabernet is distinguished by special gentle taste, rich race and moderate ratio of alcohol and acidity.

It is of average or later than average ripening period.

It is of average growing. The harvest to gain conditional harvest is 6-7 tons per hectare. The sugar content in ripe production is 190-220 gr/dm^3, with the acidity of 8-9 gr/dm^3.

WINE TELIANI

Wine Teliani is premium-quality controlled dry red wine of appellation of origin. It is produced with the grape of species Cabernet-Sauvignon with fully stopped must.

Wine Teliani is characterized with dark red color, with pure species-specific aroma, spicy, harmonious and developed race.

Chemical characteristics of the wine Tibaani should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,5-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

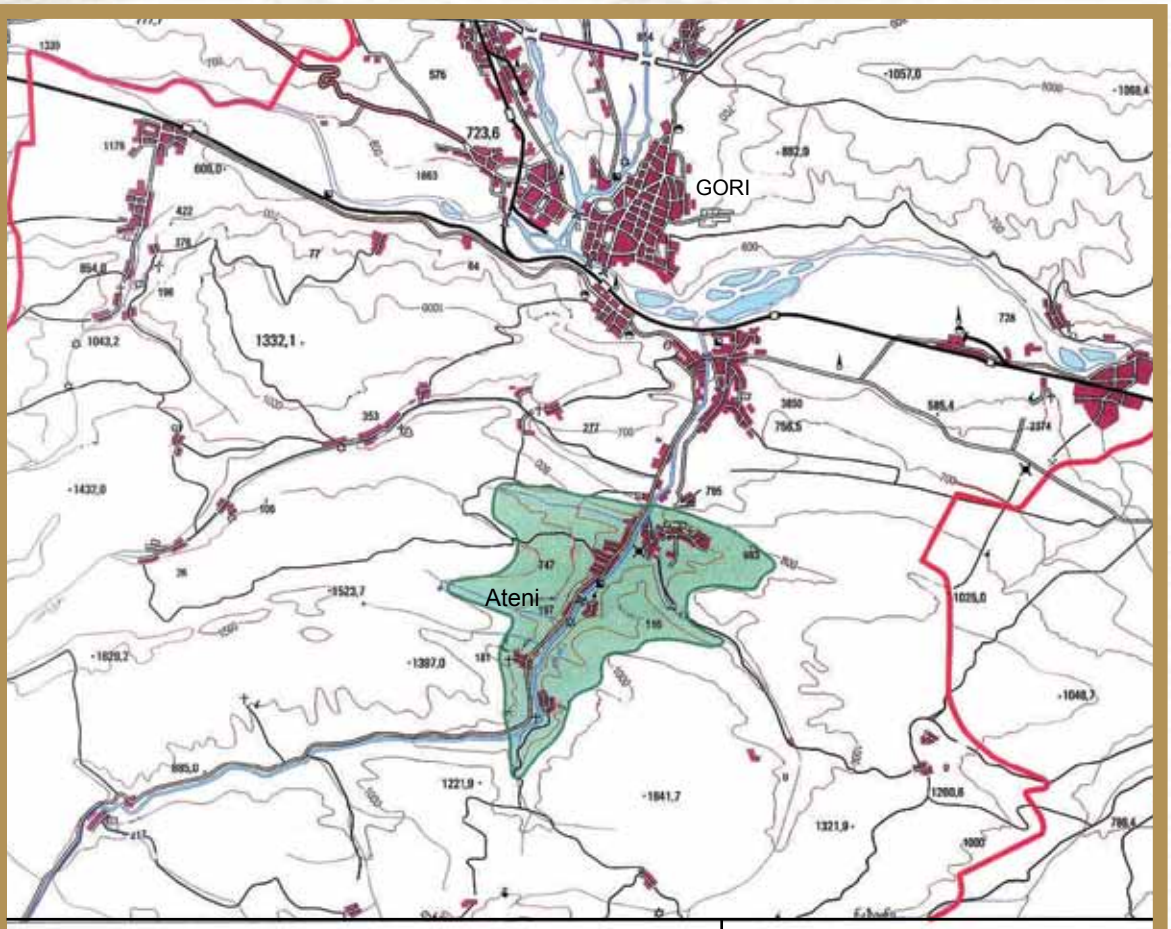
AREA OF SPECIFIC ZONES

The area of the specific zone of Teliani is approximately 10,5 sq. km.

The moderately humid climate and brown meadow and alluvial soils create favorable conditions for Cabernet-Sauvignon to grow to produce high-quality red table wine with special gentle taste, rich race and optimal ratio of alcohol and acidity.

Ateni
(Atenuri)

REG. №792 (10.12.2007)



LEGEND

Sviri Zone

railway, stations

main highways

boundary of region

rivers, canals

GORI REGION

ATENI ZONE

SCALE 1:100 000

Appellation of Origin of "Ateni" ("Atenuri") Wine

GEOGRAPHICAL LOCATION

The specific zone of Ateni is located in Shida Kartli, in the administrative district of Gori, on the foot of the North-eastern slopes of Trialeti Ridge, in the hilly zone of foothills, with the coordinates of the North latitude 42°31' and the East longitude and the Eastern longitude 42°54', on the right and left banks of the river Atenuri creating two slopes and plains of opposite (the Northern-eastern, the Southern and the South-western) inclinations, directed towards the basin of the river Atenuri.

The vineyards in the micro-zone are located at 620-750 m above sea level and include the villages of Patara Ateni, Gardateni and Didi Ateni.

CLIMATE

The specific zone belongs to moderately humid subtropical climatic zone with the moderately warm steppe climate transient to the moderately humid climate. The zone is characterized by hot summer and cold winter.

Annual duration of sunshine is 2200-2300 hours, with over 1500-1700 during the vegetation period. Average annual air temperature is 10,7°C, that of the warmest month (August) is 22,0°C and of the coldest month (January) is 1,5°C.

A stable transition of the average daily air temperature over 10°C takes place from the middle of April (16.IV), and the falling takes place at the end of October (25.IX). The duration of this period is 192 days. The total of active temperatures of 10°C approximates to 3450°C.

It has been observed that the amount of heat at about 650 meters above sea level is sufficient to gain quality product in the gorge of the river Tana protected against the winds, on the right bank of the river Mtkvari is possible in 75% of years, i.e. seven or eight times in every 10 years, and the high-quality product can be gained from the species of Chinuri and Goruli Mtsvane in 25% of years, i.e. once in every four years.

To the South from the city of Gori, in the gorge of the river Tana, as the altitude increases, the annual sum of the precipitations gradually decreases and in Ateni, at 620 m above sea level it is 560 mm. Average monthly amount of precipitations is the greatest in May (73 mm) and is the least (32 mm) in August. In the warm period of the year, at most 344 mm of precipitations falls. Hydrothermal coefficient from the middle of July up to the beginning of October (during 112 days) is less than 1. Especially droughty are July and August when vineyards need intense irrigation. In other months, the precipitations are more than the amount of moisture evaporated from the surface of soil and vegetation.

The number of days with hail is 2 in the year on average. It relatively more often hails in May (0,8 days).

In the gorge of the river Mtkvari, Gori Region, winds of Northern-western (44%)

and the South-eastern (41%) directions prevail. Winds in the gorge of the river Tana are less strong. Windings of Trialeti ridge – Satskhenisi and Tsereti ridges protect the gorge of the river Tana against the direct action of the air masses from the mentioned directions. Winds mostly blow along the gorge, with their power decreased deeper in the gorge.

The average of minimal air temperatures is relatively greater at the coastline and varies within the limits of 12-14°C. Under such conditions, the frosts of -17 – -19°C are expected once in every 10 years significantly damaging annual winter crops.

SOILS

There are mainly two types of soils spread here – brown and alluvial. Dealluvial and proalluvial soils are spread as minor spots.

Thickness of the soil profile is 0,7-1,5 m and that of the soils with active humus is 30-60 cm. According to texture, the soils are mainly attributed to heavy loamy and light clay types, with the content of physical clay of 40-70%. The content of clay is mainly increased at the expense of sediment fractions (<0,081mm) and therefore the solids are attributed to the sedimentary-muddy group. The soils contain carbonates in small quantities, with 0,2-14,0% of them in the profile. Reaction of soil area (pH) is weak and average alkaline; pH equals to 7,2-8,2. The content of humus is low or average, with 3,25-0,5% in the profile. The soils are mostly poor in hydrolysis nitrogen, with the content of maximum 6,0 mg in 100 gr of soil. In exceptional cases, its content is average reaching 7-10 mg in 100 gr of soil. Containes of soluble phosphorus in average and small quantities equalling to 6,0-1,2 mg in 100 gr of soil, are represented as a trace only in some cases. The content of exchange potassium is average or low at 46,0-9,2 mg in 100 gr of the soil trenching layer. The sum of the bases (Ca+Mg) absorbed by the soil is average to high and equals to 20,0-54,3 milliequivalents in 100 gr. of soil. The greatest proportion in this sum contains absorbed calcium with manganese being in the least quantity.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of Atenuri, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF CHINURI

Growing area: Up to 640-830 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,0 x 1,5 m
Height of stem: 90-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-10 buds
Harvest: 8-9 tons per hectare.

SPECIES OF GORULI MTSVANE

Growing area: Up to 640-830 m above sea level

Plot of planting: 2,5 x 1,5 m; 2,0 x 1,5 m
Height of stem: 90-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 8 tons per hectare.

SPECIES OF ALIGOTE

Growing area: Up to 640-850 m above sea level
Plot of planting: 2,5 x 1,5 m; 2,0 x 1,5 m
Height of stem: 90-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 8 tons per hectare.

SOIL CULTIVATION

Autumn and spring plough and cultivation of soil, finishing the vegetation irrigation one month before the vintage.

In dry land preserving the soil surface in a loose state.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew.

Pests: Western grape warm, mealybug, variegated grape moth.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES CHINURI, GORULI MTSVANE AND ALIGOTE

CHINURI

Georgian indigenous wine species of white vine giving high-quality product, which is known as species Atenuri in literary sources. According to the farming designation, it is attributed to the group of grapes used for table wines and sparkling bulk wine. It is of late ripening period, with stronger than average grow.

Average harvest amounts to 8-9 tons per hectare. The sugar content is 170-205 gr/dm^3, with the permanent acidity of 7-8 gr/dm^3. Average weight of the bunch is about 172-185 gr.

GORULI MTSVANE

Georgian white vine species giving high-quality product. It is of late ripening

period, and unlike other species, accumulates sugar in greater quantities.

The vine is stronger than average grow. Average harvest is 8 tons per hectare. Sugar content of the ripe grape reaches 216-225 gr/dm^3, with the acidity of 9,1-10,0 gr/dm^3.

ALIGOTE

French white vine species. The economic designation of the species is to make high-quality table wine and sparkling wines. It starts ripening in the first half of September. It is of average growing. The harvest is up to 8-9 tons per hectare. The average weight of the bunch is 125-130 gr.

Sugar content of the ripe grape reaches 200-210 gr/dm^3, with the acidity of 8,5-9 gr/dm^3.

WINE ATENURI

Wine Atenuri is premium-quality controlled sparkling white wine of appellation of origin. It is produced with the secondary fermentation of bulk wine produced with vine species Chinuri and Goruli Mtsvane (species Aligote is also recommended).

Wine Atenuri is characterized with straw color, harmonious taste, fruit tones and energetic play.

Chemical characteristics of the wine "Atenuri" should correspond to the following indicators:

Volumetric spirit-content, % – 11,5

Mass concentration of sugars

Very dry – no more than 3 gr/dm^3

Dry – 20-35 gr/dm^3

Semi-dry – 35-50 gr/dm^3

Semi-sweet – 50-80 gr/dm^3

Sweet – 80 gr/dm^3 and over

Titrated acidity – 6,0-7,0 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract is no less than 16 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

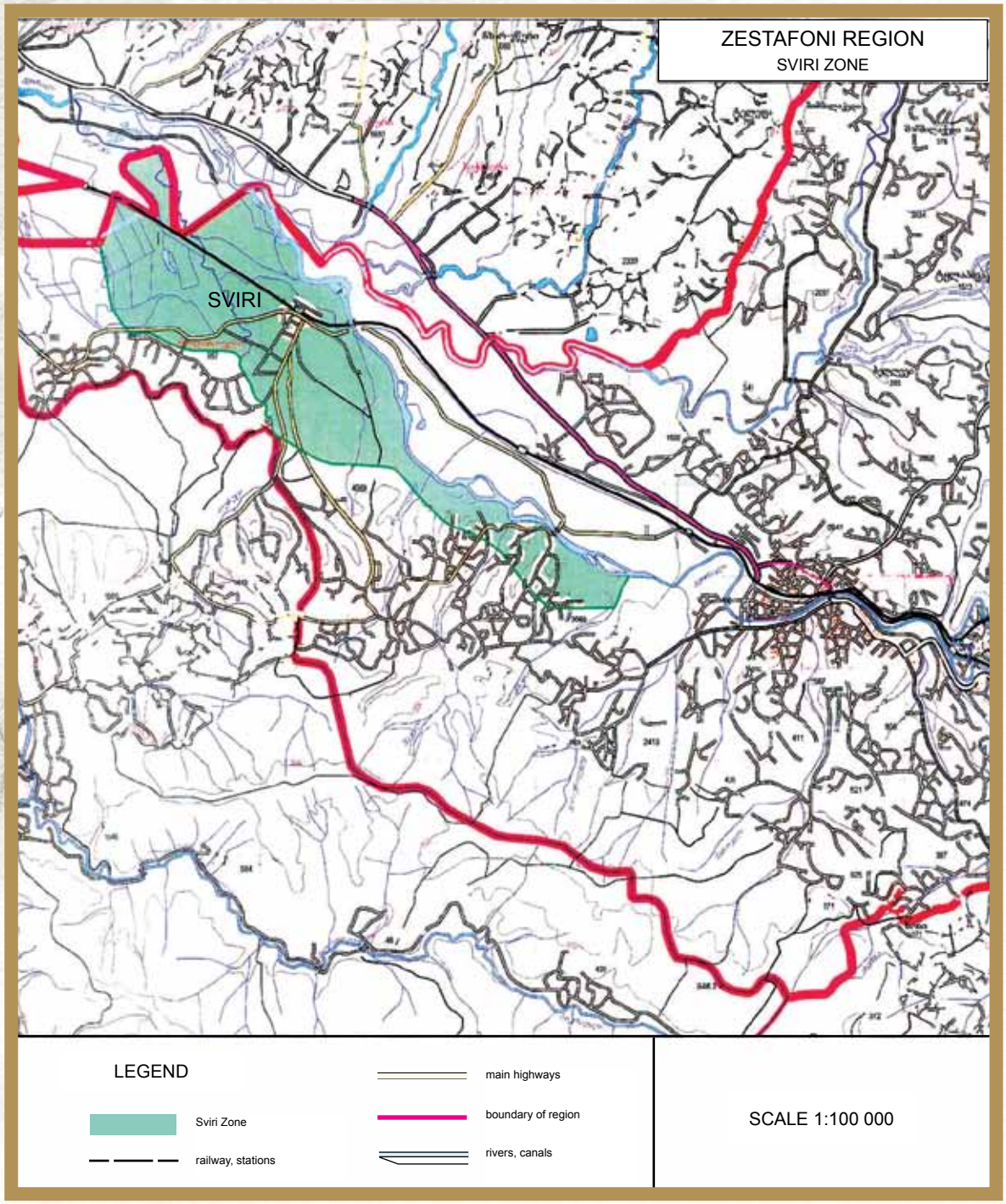
AREA OF SPECIFIC ZONES

The area of the specific zone of Atenuri is approximately 14,5 sq. km.

The complex of local historical and modern technologies of making wine in the gorge of Ateni, favorable natural-ecological conditions (influence of high mountainous system on temperature regime) and properties of indigenous species allow producing Georgian traditional sparkling wine Atenuri.

Sviri

REG. №793 (10.12.2007)


ZESTAFONI REGION
SVIRI ZONE
SVIRI
LEGEND
Sviri Zone
railway, stations
main highways
boundary of region
rivers, canals
SCALE 1:100 000

Appellation of Origin of "Sviri" Wine

GEOGRAPHICAL LOCATION

The specific zone is located on the left shoreline of the river Kvirila, the tributary of the river Rioni, with the coordinates of the North latitude 42°07' and the East longitude and the Eastern longitude 42°55', on the Northern inclinations of the Southern foothills of Middle Imereti. It includes the following villages: Pirveli Sviri, Meore Sviri, and administrative borders of Rodinauli. Absolute altitude above sea level is 220 meters.

CLIMATE

The mentioned specific zone belongs to the zone of sea humid subtropical climate and is characterized by mild, warm winter and hot summer.

The annual duration of sunshine is 2100 hours, and 1550 hours during the vegetation period. Average annual air temperature is quite high and is +14,0°C. The temperature of the warmest month (August) is +24,2°C, and that of the coldest month (January) is +4,4°C.

A stable transition of the average daily air temperature above 10°C takes place at the end of March, and the fall below 10°C takes place in the third decade of November. Thus, the duration of the period with the temperature above 10°C is 230-235 days. Total of active temperatures is over 4300°C on average.

Annual sum of atmospheric precipitations is 1500 mm, and 675 mm during the vegetation period. Average monthly amount of precipitations is the greatest in winter (175-180 mm) and is the least (71 mm) in August.

The amount of precipitations in July and August (76-71 mm) almost equals to that of their evaporation. This means that in some years the vineyards need irrigation.

Hail is expected during the whole year, however, in insignificant amount (0,7-1,0 days). It most frequently hails in May (0,3 days).

Winds of Western (36%) and Eastern (35%) directions mainly prevail. They are partially substituted by South-eastern winds (12%). Average annual wind speed is 2,2 m/sec. According to seasons, the winds are strongest in spring. The number of days with strong winds is 34.

According to the negative influence of winds, the specific zone belongs to the second group of wind activity and therefore, the main windbreaks should be planted directed from the North to the South and distanced by 250 meters. The number of rows in the main windbreaks should be 4, and that in the additional windbreaks should be 2.

In autumn, the first night frosts start after the fall of the vine leaves at the end of November (25.XI).

The average of annual absolute minimums of air temperature once in every 10 years is expected to fall to -13°C. The absolute minimum of air temperature may fall to -19° – -20°C what is a very rare event.

SOILS

The territory to produce the wine Sviri is located in the Western Georgia and namely, in the extreme the Eastern parts of Kolkheti Lowland and border directly the foot of the Northern and Southern slopes of the Caucasioni foothills. Most of the territory is of a plain relief, and its South-eastern part, which is represented in the hilly zone of the foothill, is a slightly inclined slopes and small terraces and plains directed towards North-west and West.

In the lower belt, there is a variety of alluvial and dealluvial soils spread. In the middle layer, there is a variety of bleached soils.

The above-mentioned soils differ from one another by the thickness of profiles and humus-containing layers and degree of skeletal texture.

Among the above-mentioned soils, alluvial soils are spread on the first and second terraces of the river Kvirila. The thickness of profile of these soils exceeds 1 meter, and the thickness of active humus-containing layer varies within 30-40 cm. According to texture, the second terrace presents relatively old alluvial soils, which are mainly heavy loamy and clay soils, and relatively new alluvial soils are average and light loamy soils. Some of the sections are characteristic with skeletal texture.

Dealluvial soils are represented on foots of the lower slopes of the hilly zone of the foothills comparatively in short sections forms. Thickness of profile of these soils exceeds 1 meter, and that of a humus-containing active layer varies within the limits of 40-50 cm. The soils are characterized by clay texture.

Content of humus in the active layer of alluvial and dealluvial soils is mainly 2,5-1,5%, gradually decreasing in lower layers. Hydrolysis nitrogen is for the most part contained in small quantities mainly amounting to 2,5 mg. in 100 gr. of soil. The content of phosphorus is also low not exceeding 8,0 mg. in 100 gr. of soil. The content of exchange potassium varies within great limits and mainly amounts to 5,0-4,0 mg. in 100 gr. of soil. The reaction of soil area is mainly neutral and weak alkaline, and in some cases, it is weak acid reaction. The indicator pH varies between 5,8-7,6. Some sections of soils contain carbonates in small quantities. Bleached soils are spread in the middle belt of the zone with the thickness of profile of 70-100 cm, and with the thickness of active humus-containing layer of 25-35 cm. The soils are of heavy loamy and clay texture with weak acid reaction. The content of humus in the active layer is 2,5-1,5% and gradually decreasing in the lower layers. The content of main nutrient elements (NPK) is mostly little.

Humic-calcareous and brown soils are spread in the upper part of the micro-zone, on the forms of hilly relief. The thickness of the profile of these soils is 60-100 cm, and that of the soil with active humus layer is 30-40 cm. The soils are characterized by heavy loamy and clay texture. The content of humus in the active layer is within the limits of 2-3% and gradually decreasing in the lower layers. According to the content of the main nutrient elements (NPK), these soils are mostly characterized by low indicators, reaching average values in some cases only. The reaction of soil area pH in brown soils is mostly neutral or inclined to weak acid one and pH indicator equals to 5,6-7,0. In humic-calcareous soils it is average or weak alkaline with pH of 7,3-8,0. The content of carbonate in humic-calcareous soils is mainly 2,5-16,0% reaching even greater values in some cases.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of Sviri, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF TSOLIKOURI

Growing area: Up to 170-270 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 6-7 tons per hectare.

SPECIES OF TSITSKA

Growing area: Up to 170-270 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-8 buds
Harvest: 6 tons per hectare.

SPECIES OF KRAKHUNA

Growing area: Up to 170-270 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-8 buds
Harvest: 6 tons per hectare.

SOIL CULTIVATION

Minimal and zero soil cultivation, a grass and lawn system, soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATION

Principal diseases: Mildew, powdery mildew.
Pests: Ticks, mealybug, variegated grape moth.
Control measures: Applying contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES TSOLIKOURI, TSITSKA AND KRAKHUNA

TSOLIKOURI

Indigenous wine species of white vine widely spread in the Western Georgia. It is of late ripening period, with stronger than average grow. Average harvest in the

principal regions of growing amounts to 6-7 tons per hectare. The average weight of bunch is 150-160 gr.

The sugar content in ripe grape is 200-250 gr/dm^3, with the permanent acidity of 7,5-9,5 gr/dm^3. Local wines and those of European type made with it are characterized by great body, harmonious taste, buoyancy and taste indicators.

TSITSKA

Georgian white wine species. It belongs to the group of Imereti indigenous vine species. It is of late ripening period, of lower than average grow. Conventional harvest is 5-6 tons per hectare. The average weight of the bunch is 130-150 gr.

Sugar content of the ripe grape reaches 180 gr/dm^3, with the acidity of 6,9-10,5 gr/dm^3.

This species produces high-quality production and is successfully used to make sparkling wines.

KRAKHUNA

Georgian white wine species. It belongs to the group of Imereti indigenous vines of. It is of late ripening period, with average grow. Conventional harvest is up to 6 tons per hectare. The average weight of the bunch is 140-160 gr.

Sugar content of the ripe grape reaches 210-230 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3.

This species produces high-quality production and is successfully used to make sparkling wines.

WINE SVIRI

Wine Sviri is supreme-quality controlled dry white wine of appellation of origin. It is produced with the grape of species Tsolikouri and Tsitska (species Krakhuna is also recommended) with stopped must on fermented rape (the proportion of rape constitutes 5-6% of must).

Wine Sviri is characterized with dark straw-yellowish tint, fruit tones, developed race, extractability and harmonicity.

Chemical characteristics of the wine Sviri should correspond to the following indicators:

Volumetric spirit-content, % – 11,0-12,5

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,5-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 18 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

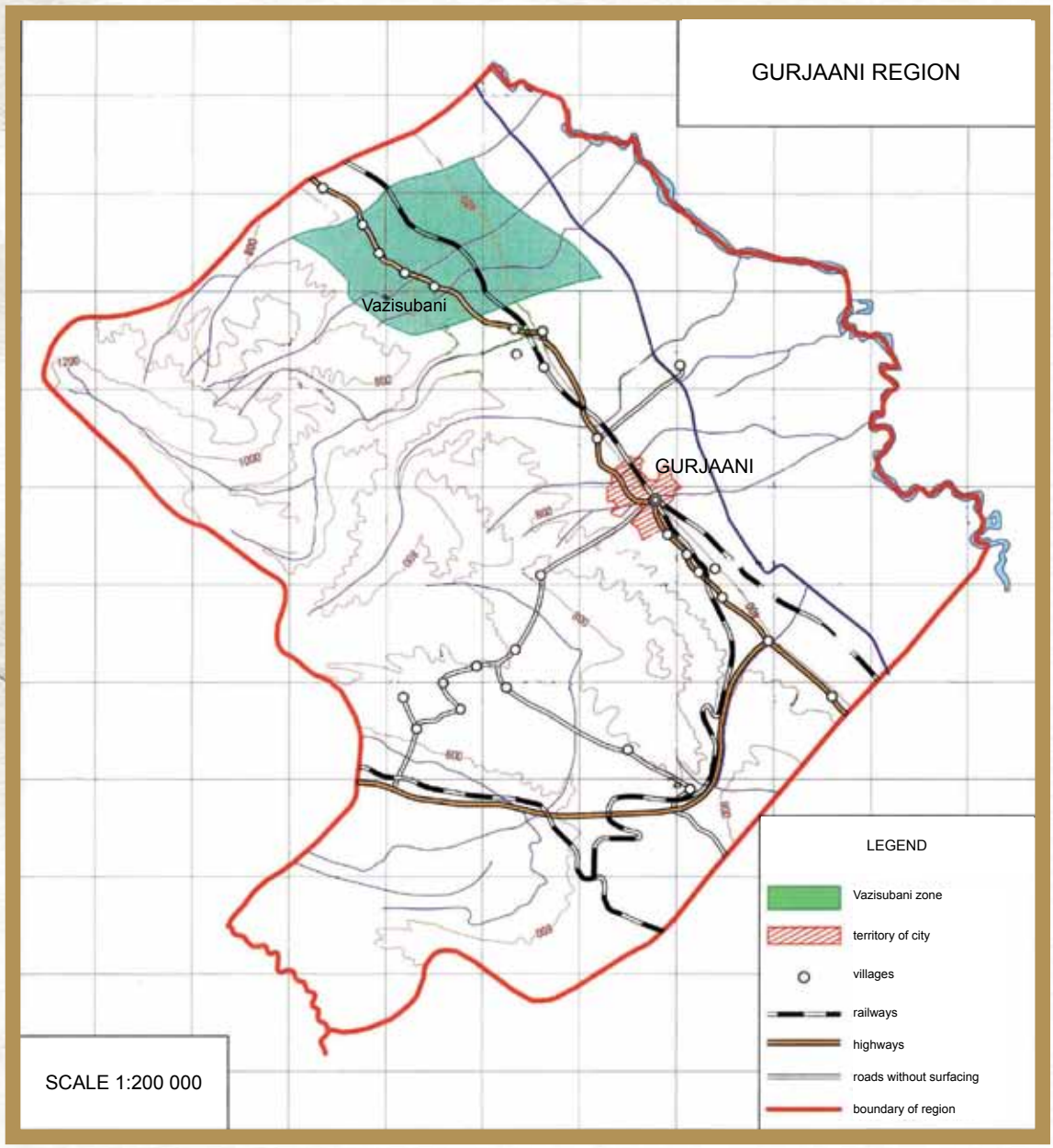
AREA OF SPECIFIC ZONES

The area of the specific zone of Sviri is approximately 27 sq. km.

Location, soils and climatic conditions, aroma of the vine species Tsolikouri and the peculiarity of making the wine allows producing high-quality controlled dry white wine Sviri of appellation of origin.

Vazisubani

REG. №794 (10.12.2007)


GURJAANI REGION
Vazisubani
GURJAANI
LEGEND
Vazisubani zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Vazisubani" Wine

GEOGRAPHICAL LOCATION

The specific zone of Vazisubani vine-growing area is located in the middle stream of the river Alazani, with the coordinates of the Northern latitude of 41°49' and the Eastern longitude of 45°43', on the areas for vineyards on one of the aprons of Tsiv-Gombori ridge with the inclination of 5-6° eastwards. It is bordered by high wind of Tsiv-Gombori Ridge from the West and the North-west, and by the areas with vineyards of Mukuzani from the East and the North-east. It is located at 550 m above sea level and includes the villages of Vazisubani, Kalauri, Shashiani and Vachnadziani.

CLIMATE

The climate is moderately humid with hot summer and moderately cold winter, with double fall of precipitations during the year. The annual duration of sunshine is over 2180 hours, and reaches 1610 hours during the vegetation period. Direct solar radiation on horizontal surface is 70-75 kcal/cm^2 per annum, dissipated radiation is 50-54 kcal/cm^2, total solar radiation per annum is 120-130 kcal/cm^2. The ratio of the actual amount of sunshine to its possible amount in summer months and September is generally very high and equals to 68%.

The number of clear days in the grape ripening period (August-September), according to the cloudiness of general and lower tiers is 17-18 on average.

Average annual air temperature is 11,9°C. Average temperature of the coldest month (January) is +0,5°C and the temperatures of the warmest months of July and August almost equal and amount to 23,1°C and 22,9°C. Average of annual absolute minimums of air temperature is -10°C, absolute minimum is -23°C. Average of annual absolute maximums of air temperature is 34°C, and absolute maximum is 38°C.

Daily amplitude of air temperature is the highest in summer months (June, July, August) and is 9°C and more on average. This indicator is the lowest (4,8-5,5°C) in winter.

A stable transition over the average daily temperature of 10°C (the beginning of active vegetation of vine) takes place oi April (8.IV), and the fall below this point takes place in autumn in October (30.X). The period of daily temperatures of more than 10°C lasts for 204 days with the total of active temperatures of 3730°C.

Sum of active heat (4000°C) may accumulate once in every 10 years (10%). According to the total heat (3800°C), good-quality bulk wine may be produced in 50% of years.

The first night frosts in autumn start in November (15.XI) on average. Such frosts may start on October the 20-th once in every 10 years. However, by this time, the grape vintage is over.

The last night frosts in spring end on 1.IV on average. The late frosts may last until April the 17-th once in every 10 years.

The annual sum of atmospheric precipitations is 884 mm, with 662 mm in the vegetation period. The greatest amount of precipitations (150 mm) falls in May and June (130 mm), when grape ripens, and is quite high in September equalling to 75 mm.

Average annual relative air humidity is 71%. In the vegetation period, this

indicator is no more than 68%.

The annual number of days with hail is 2,2 on average. It most frequently hails in May (0,7 days) and June (0,5 days). In the years with enormous amount of hail, the number of days with hail may reach 5.

Average annual temperature of the soil surface is 14°C. In the warmest months (July, August) the average temperature of the soil surface is 28°C, and in the coldest month (January) it is -1°C.

Winds of Western (32%) and Southern-western (23%) directions prevail here. Average annual wind speed is 1,4 m/sec.

Following the analysis of the mentioned data, the specific zone belongs to the III-category region of wind negative activity.

SOILS

The soils here are represented by the varieties of brown forest, brown meadow and alluvial types, which differ from one another with the thickness of profile, degree of skeletal-structure and texture. Brown forest soils are spread in the upper belt of the Northern-eastern slopes of Tsiv-Gombori mountains; brown meadow soils are spread in the lower belt of these slopes, adjacent to the second terrace of the river Alazani, along the irrigation channel of the lower Alazani. Alluvial soils are spread on the second terrace of the river Alazani up to the first terrace of the Alazani, below the irrigation channel of lower Alazani.

There are three varieties of brown forest soils, two varieties of brown meadow (old alluvial) soils and four varieties of alluvial-proalluvial soils distinguished in the specific zone:

1. Brown forest of great thickness, weakly skeletal, average and heavy loamy soils;
2. Brown forest of average thickness, weakly skeletal, average and heavy loamy soils;
3. Brown forest of average thickness, with little humus, averagely skeletal and weakly stony, heavy loamy soils;
4. Brown meadow (old alluvial) of great thickness, clay soils;
5. Brown meadow (old alluvial) of great thickness, weakly skeletal, clay soils;
6. Alluvial-calcareous of great thickness, heavy loamy and clay soils;
7. Alluvial-calcareous of great thickness, weakly skeletal and loamy soils;
8. Alluvial-proalluvial, calcareous of great thickness, weakly skeletal, clay and heavy loamy soils;
9. Alluvial-proalluvial, calcareous of great thickness, skeletal, light loamy and sandy soils.

The first three varieties of the above-listed types of soils are spread in the upper belt, on the North-eastern slopes of Tsiv-Gombori mountains and on slightly inclined slopes. The fourth and fifth varieties are spread on foots of the mentioned slopes, in the lower belt and on slightly inclined plain relief, adjacent to the second terrace of Alakani. The soil varieties of the sixth and seventh groups are spread on the second terrace of the Alazani plain bordering Tsiv-Gobmori mountains from north-east and south-east.

The first three varieties of soils spread in the upper belt are characterized by average and great thickness of profile of 70-100 cm, and with the humus layer of 30-60 cm thick. They are characterized by heavy loamy texture. The first type of soil is characterized by weakly skeletal structure, and the soils of second and third groups are characterized by average skeletal structure. The first three varieties of soils in the

lower layers are characterized by dark brown and brown colour, and by straw-whitish tint in the lower layers. The soils of the fourth and fifth group spread in the lower belt of the mentioned slopes are characterized by great thickness of profile (100-150 cm), with 50-60 cm thick humus layer. According to texture, they mainly belong to loamy and clay soils, and the soils of the ninth variety is the loamy and sandy soils. The soils of the 7-th and 8-th varieties are weakly skeletal, and those of the 9-th variety are of average skeletal structure.

The content of humus in all types of soils is mainly little of 0,5-3,0%. The content of hydrolysis nitrogen is also low for the most part not exceeding 5 mg. in 100 gr. of soil. Soluble phosphorus and exchange potassium also have little proportions, except for some cases. The average amount of calcium carbonates is 8-20%. The soils of the third variety are exception in this respect with the content of calcium carbonates of up to 42-44%. The reaction of soil solution (pH) is mainly average alkaline and pH indicator varies within the limits of 7,5-8,0. The sum of the absorbed bases (Ca+Mg) is average equalling to 15-30 milliequivalents in 100 gr of soil. The soils of the first and second varieties are exceptions with the same indicator constituting 33-47 milliequivalents in 100 gr of soil.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the bulk wine of Vazisubani, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SPECIES OF KAKHURI MTSVANE

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 6-7 tons per hectare.

SOIL CULTIVATION

Autumn and spring plough of soil. Moisture-preservation measures – preserving the soil surface in loose state (cultivation, milling, mulching). Ending the vegetation irrigation one month prior to vintage.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rots.

Pests: Ticks, the Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES RKATSITELI AND KAKHURI MTSVANE

RKATSITELI

Wine species of white vine. It is distinguished for high economic-technological properties, good resistance in various conditions and high dignity of production. It is of average or later than average ripening period, high-yielding (average weight of the bunch is up to 160-250 gr). The average harvest is 9-10 tons per hectare.

The sugar content in the ripe grape is 220-240 gr/dm^3, with the permanent acidity of 5-6 gr/dm^3.

KAKHURI MTSVANE

Georgian white vine species giving high-quality product. It completely ripens at the end of September.

Its bunches are of average size with the average weight of 160-175 gr. Ripe bunch is of green-yellowish color and has a very pleasant species-specific aroma. The content of sugar in the ripe grape is 200-220 gr/dm^3, with 6-7 gr/dm^3 of acidity. Average harvest to produce high-quality wines is 7-8 tons per hectare.

WINE VAZISUBANI

Wine Vazisubani is premium-quality controlled dry white wine of appellation of origin. It is produced with the grape of species Rkatsiteli (85%) and Kakhuri Mtsvane (15%) with fully stopped must.

Wine Vazisubani is characterized with light straw color, harmonious taste, buoyant well-developed race and flower tones.

Chemical characteristics of the wine Vazisubani should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,5

Mass concentration of sugars of no more than 4 gr/dm^3

Titrated acidity – 5,5-7,5 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

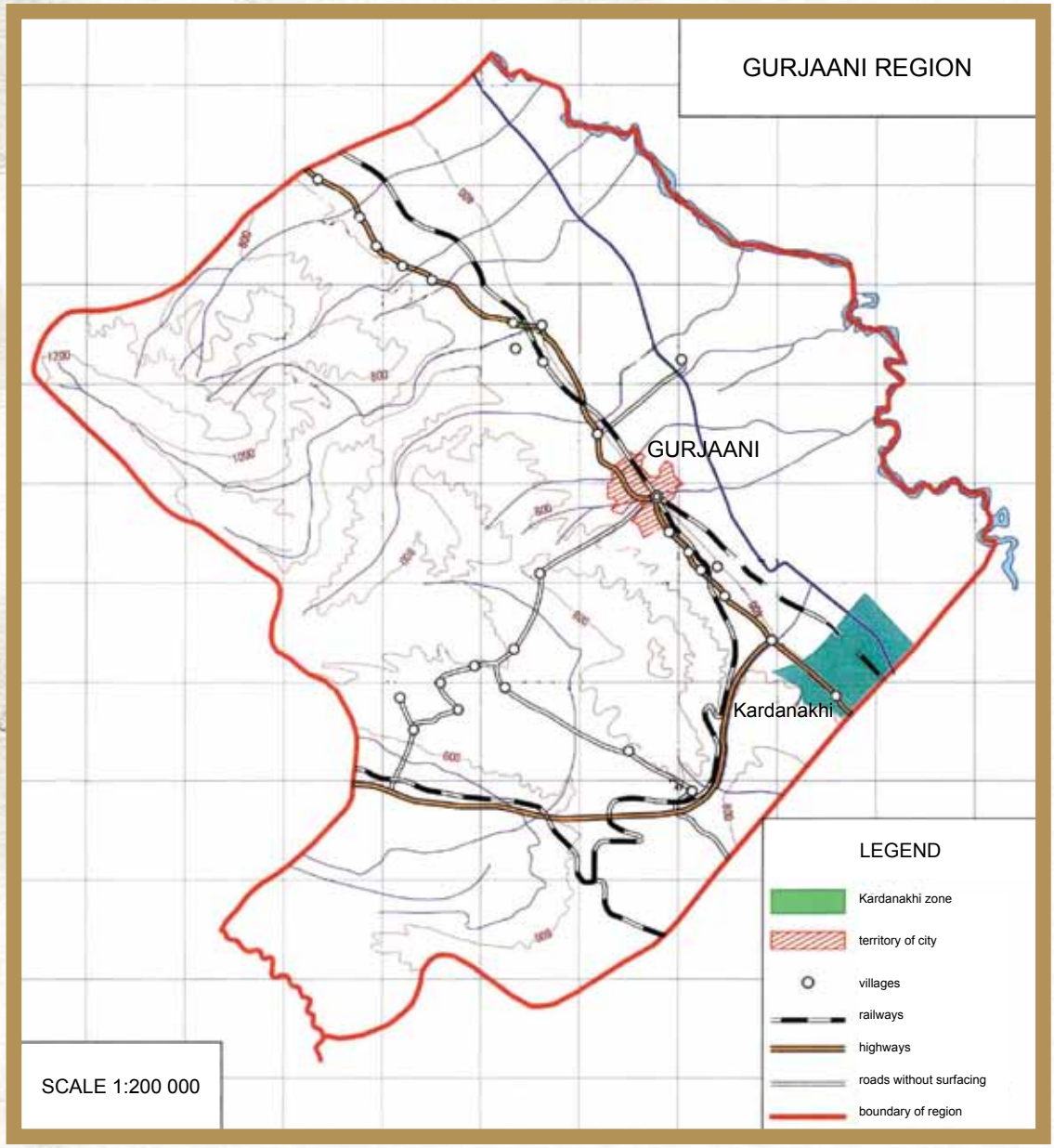
AREA OF SPECIFIC ZONES

The area of the specific zone of Vazisubani is approximately 62 sq. km.

Moderately humid climate, humus-calcareous soils, taste indicators of Rkatsiteli and Kakhuri Mtsvane and the traditional wine-making technology make for the harmonicity and buoyancy of the wine Vazisubani.

Kardenakhi

REG. №795 (10.12.2007)


GURJAANI REGION
GURJAANI
Kardanakhi
LEGEND
Kardanakhi zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Kardenakhi" Wine

GEOGRAPHICAL LOCATION

Specific zone of Kardenakhi is located on the administrative territory of the village of Kardenakhi, Gurjaani Region, on the low with the of inclination of 3-4° of the North-eastern slope of Tsiv-Gombori Ridge, on the right side of the river Alazani. Its coordinates are as follows: the Northern latitude of 41°48' and the Eastern longitude of 45°44', at 350-750 m above sea level. The plots are located between Gurjaani-Tsnori railway and motor ways, between the administrative borders of the villages of Bakurtsikhe and Anagi. The territory includes three massifs with the total area of 345 ha.

CLIMATE

The specific zone is characterized by moderately humid climate, with hot summer and moderately cold winter. The climatic conditions are stipulated by air masses distributed from East to West, developed in subtropical and moderate latitudes. The processes resulted from the relief of the location and namely, from the high mountain tops of Gombori and those covered with Caucasioni glaciers and cold air masses flowing from them are also very important.

The average annual duration of the solar radiation is 2154 hours, equalling to 1589 in the vegetation period.

Average annual air temperature is 12,5°C. Average air temperature of the coldest month (January) is 1,0°C, and that of the warmest month (July, August) is 23,6°C. Average of the annual absolute minimums of air temperature is -10°C, which may fall to -15°C once in every 10 years. Average of the annual absolute maximums of air temperature is +35°C, and the absolute maximum reaches +38°C.

A stable transition of the air temperature above 10°C (the beginning of the active vegetation of vine) takes place in April (5.IV), and falling of temperature below the mentioned point takes place in the first five days of November (3.XI). Duration of the period with the temperature above 10°C is 211 days. The sum of active temperatures above 10°C is 3920°C on average.

Average annual sum of atmospheric precipitations in Kardenakhi specific zone is 770 mm, with 585 mm in the vegetation period, i.e. 76% of the annual amount of precipitations fall in the vegetation period. Maximum level of precipitations during the year is fixed in May (132 mm), and minimum is fixed in January (31 mm).

According to the seasons, atmospheric precipitations are distributed as follows: most of them (32%) in spring and summer, relatively less (23%) in autumn and in winter (13%).

Average annual relative humidity of air is 72%. During the vine vegetation period, this indicator is 70%. Relative humidity in Kardenakhi specific zone reaches its maximum at the end of autumn (80%) and in the first half of winter (78-76%). It is

relatively less (64-63%) in summer months of July and August. A snow cover appears from the middle of December disappearing in the first decade of March. The number of snowy days in the year is 24 on average. In most years, the snow cover is instable.

The first autumn night frosts start from November 25, on average. Once in every 10 years, early frosts, at the end of October may take place what poses no danger to green parts of vine. The last spring night frosts in the specific zone on average end in the last decade of March. Once in every 10 years the spring frosts may last until April the 15-th.

The specific zone is located in the region of active hail. The number of days with hail in the year is 2,9 on average. During the year, it most frequently hails in May and June (2,1 days). Some years may have 5 or 6 days with hail.

The winds of the Southern-western (33%) and the Western (18%) directions prevail here. As for the winds of any other directions, they are not very frequent here.

Average annual wind speed in the specific zone is 1,7 m/sec. Wind speed does not exceed 1,7 m/sec either in warm, or cold periods of the year.

The days with strong wind in the specific zone are rare. According to the wind activity, the given zone belongs to the III group.

According to average multi-year data, the average of the annual absolute minimums of air temperature is -10°C, which may fall to -15°C once in every 10 years.

Average annual temperature on the soil surface, which is humus-calcareous, is 15°C. The average temperature of soil surface in July-August is the highest and constitutes 30°C, and it does not fall below 0°C in the coldest month of January. Average maximum temperature in August is 52°C and 53°C in July. Average minimum temperature in winter months is within the limits of -3°C and -5°C.

The sum of active temperatures above 10°C is 3920°C on average (50%). Duration of the period with the temperatures above 10°C is 211 days.

The total number of cloudy days (8-10 points) in the year is approximately 110-120. Out of the total number of cloudy days, the number of cloudy days during the cold period (XI-III) is 59, and 61 days during the warm period (IV-X), i.e. during seven months. The least number of cloudy days (5-6 days) during the year are in July-August. More cloudy days (10-12) are in March-April. According to general cloudiness, the number of clear days (0-2 points) is 45 per year. Most of clear days are in the period from July to September.

SOILS

The soil-forming rocks are loamy-clay and stony-detritus carbonate sediments of dealluvial-proalluvial origin.

The total area is about 345 ha.

There are 11 varieties of brown and 1 variety of dealluvial soils spread here.

The first variety of soil is brown clay soil of great thickness in the Northern part of the cut-out Guli Tsarapi. Thickness of the profile of this soil is 90-100 cm and that of the humus-containing layer is 75-75 cm.

The second variety of soil is brown soil of great thickness, weakly skeletal and

stony, light clay. It is spread on the most part of the plot Motskobili, in the Western part of Guli Tsarapi and on the plot Akhoebi as short contours. Thickness of the profile of this soil is 95-105 cm, and that of the humus-containing layer is 70-80 cm.

The soil of the third variety is brown light clay of great thickness, weakly skeletal on surface. It is spread as several contours in the plot Guli Tsarapi. Thickness of the profile of this soil is 90-100 cm, and that of the humus-containing layer is 65-75 cm.

The soil of the fourth variety is brown heavy loamy and light clay of great thickness, weakly skeletal on surface and weakly stony here and there. It is spread as several contours in the plot Guli Tsarapi and in the central part of the plot Akhoebi – on most of its territory. Thickness of the profile of this soil is 85-95 cm, and that of the humus-containing layer is 70-80 cm.

The soil of the fifth variety is brown light clay of great thickness, weakly skeletal and stony. It is spread as several contours on all three plots. Thickness of the profile of this soil is 80-90 cm, and that of the humus-containing layer is 60-70 cm. Stone-formation is 3%.

The soil of the sixth variety is brown heavy loamy and light clay of great thickness, weakly skeletal and weakly stony. It is spread in the central territory of the plot Akhoebi. Thickness of the profile of this soil is 85-95 cm, and that of the humus-containing layer is 60-70 cm.

The soil of the seventh variety is brown heavy loamy and light clay of great thickness, average skeletal and stony. It is spread on a small section of the plot Guli Tsarapi. Thickness of the profile of this soil is 90-100 cm, and that of the humus-containing layer is 50-60 cm. Stone-formation is 20%, with the stone diameter of 5-20 cm.

The soil of the eighth variety is brown heavy loamy soil of average and great thickness, weakly skeletal here and there. It is spread in the Western and the Eastern parts of the plot Akhoebi. Thickness of the profile of this soil is 60-80 cm, and that of the humus-containing layer is 50-60 cm.

The soil of the ninth variety is brown heavy loamy and light clay soil of great thickness, weakly skeletal and stony. It is spread in the central part of the plot Akhoebi. Thickness of the profile of this soil is 60-90 cm, and that of the humus-containing layer is 50-60 cm.

The soil of the tenth variety is brown heavy loamy and light clay soil of average thickness, average skeletal and weakly stony. It is spread in the Northern and the Southern parts of the plot Akhoebi. Thickness of the profile of this soil is 60-80 cm, and that of the humus-containing layer is 50-60 cm. Stone-formation is 4%.

The soil of the eleventh variety is brown heavy loamy and light clay soil of average thickness, weakly skeletal and stony. It is spread in the southern part of the plot Guli Tsarapi. Thickness of the profile of this soil is 60-70 cm, and that of the humus-containing layer is 50-60 cm.

The soil of the twelfth variety is dealluvial heavy loamy soil of great thickness, average skeletal and weakly stony. It is spread in the Southern part of the plot Guli Tsarapi. Thickness of the profile of this soil is 110-120 cm, and that of the humus-containing layer is 80-90 cm.

The soils are mainly loamy and light clay by texture, with the content of physical

clay (with the fraction <0,01mm) varying within great limits of 20,0-69,4%. The content of humus in the trenching layers (0-60 cm) of the soils of the 4-th and 5-th varieties is little or average (2,04-4,91%), and is little in the same layers of other soils not exceeding 2,95%. The general content of nitrogen is mainly low of 0,067-0,128%; the content of hydrolysis nitrogen is high in every arable layer (0-25cm) of analytical sections of the soils of varieties 4 and 6 and amounts to 10,56-13,89 mg in 100 gr of soil. Its content in the trenching layers of other types of soil is low amounting to 5,00 mg in 100 gr of soil. The content of soluble phosphorus is high reaching 3,0-29,0 mg in 100 gr of soil in the arable layers. It is represented as a trace in the lower layers. The content of exchange potassium is high at almost every point (arable layer) amounting to 28,0-90,4 mg in 100 gr of soil, sharply decreasing in the lower soil layers. The content of calcium carbonate in the soil profiles greatly varies, logically increasing from up downwards from 2,0 to 44,0%. The reaction of soil area is weak and average alkaline and pH=7,2-8,2.

AGRO-TECHNOLOGICAL REGULATIONS

The following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SPECIES OF KHIKHVI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 7-8 buds
Harvest: 5-6 tons per hectare.

SPECIES OF KAKHURI MTSVANE

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-90 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 6-7 tons per hectare.
Urgent agricultural measure: Rationing of high-yielding tillers and tearing off their

tips during the phase before flowering.

SOIL CULTIVATION

Autumn and spring plough of soil. Minimal soil cultivation. Moisture-preservation measures – preserving the soil surface in a loose state (cultivation, milling, mulching).

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations and ecological resources of the given location.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rots.

Pests: Ticks, Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES

RKATSITELI

Wine species of white vine. It is distinguished for high economic-technological properties, good resistance in various conditions and high dignity of production. It is of average or later than average ripening period, a high-yielding species (average weight of the bunch is up to 160-250 gr). The conditional harvest is 9-10 tons per hectare.

The sugar content in the ripe grape is 220-240 gr/dm^3, with the permanent acidity of 5-6 gr/dm^3.

KHIKHVI

Indigenous white vine species with average ripening period. It is of average grow and average yielding. Average harvest in its growing areas is 4-6 tons per hectare. Average weight of the bunch is 90-100 gr. The content of sugar in the ripe grape is 240 gr/dm^3, with the acidity preserved at 5-6 gr/dm^3.

KAKHURI MTSVANE

Georgian white vine species giving high-quality product.

It completely ripens at the end of September.

Its bunch is of average size with the average weight of 160-175 gr. Ripe bunch is of green-yellowish color and has a very pleasant species-specific aroma. The content of sugar in the ripe grape is 200-220 gr/dm^3, with 6-7 gr/dm^3 of acidity. Average harvest to produce high-quality wine is 7-8 tons per hectare.

WINE KARDENAKHI

Wine Kardenakhi is controlled high-quality strong white wine of appellation of origin. It is made with the grape of species Rkatsiteli, Khikhvi and Mtsvane with their must held-up and fortification of the gained fermenting must.

Wine Kardenakhi is characterized with amber color, species-specific aroma, honey tones, harmonicity and moderate extractability.

Chemical characteristics of the wine Kardenakhi should correspond to the following indicators:

Volumetric spirit-content, % – 18

Mass concentration of sugars of 100 gr/dm^3

Titrated acidity – 5,0-6,0 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 18 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive No. 1493/1999 of May 17, 1999.

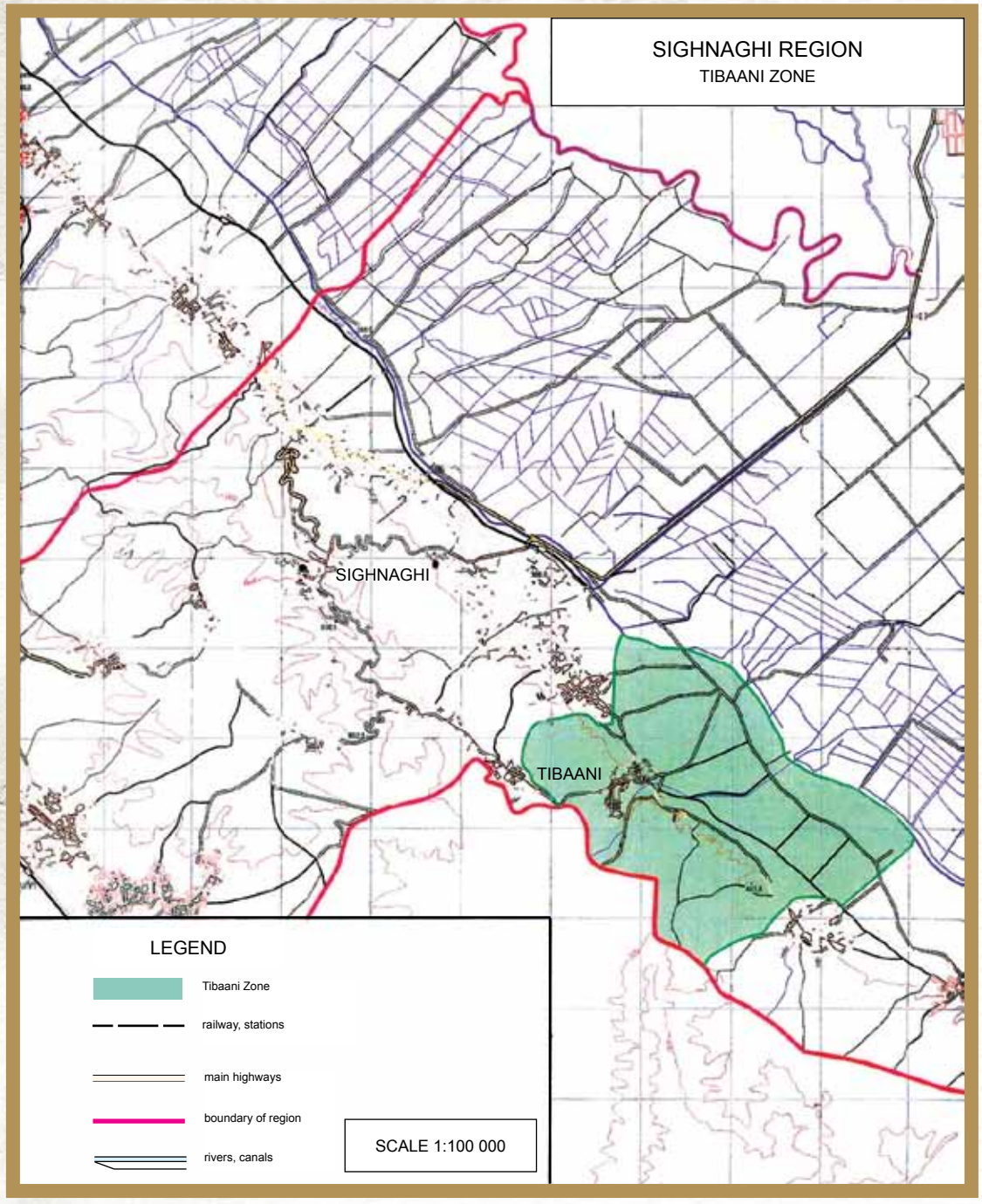
AREA OF SPECIFIC ZONES

The area of the specific zone of Kardenakhi is approximately 12 sq. km.

The exposition of Kardenakhi – the North-eastern inclination of Tsiv-Gombori mountains, the microclimate formed with the cold air masses flowing down Caucasioni glaciers, humus-calcareous and skeletal soils, and universality of local indigenous species make for the originality and high quality of Kardenakhi wines.

Tibaani

REG. №796 (10.12.2007)


SIGHNAGHI REGION
TIBAANI ZONE
SIGHNAGHI
TIBAANI
LEGEND
Tibaani Zone
railway, stations
main highways
boundary of region
rivers, canals
SCALE 1:100 000

Appellation of Origin of "Tibaani" Wine

GEOGRAPHICAL LOCATION

The specific zone of Tibaani is located in Inner Kakheti, in the Eastern part of the right bank of the Alazani lowland, on the South-eastern plain of Gombori Ridge, in Signagi Region, with the coordinates of the North latitude 41°35' and the East longitude 46°00'. The absolute altitude of the areas to be cultivated as vineyards is 350 to 550 m above sea level. The area includes the villages of Tibaani, Kvemo Machkhaani and a part of Dzveli Anagi.

CLIMATE

The climate is moderately humid subtropical here, with hot summer and moderately cold winter, with two minimums of precipitations during the year.

Average annual air temperature in the vine-growing area is quite high reaching 12,4°C. Average temperature of the warmest month is 24,2°C, and the average temperature of the coldest month is approximately +1,0°C.

A stable transition above the average daily air temperature of 10°C takes place in the first pentade of April (5.IV), and the fall takes place at the beginning of November (3.XI). Duration of the period with the temperature more than 10°C is 212 days. Sum of active temperatures (Σt>10°) is 4100°C on average. In 95% of years, total of active heat exceeds 3800°C. Once in every 10 years, its amount approximates 4000°C seven or eight times a year. The annual duration of sunshine is 2200-2300 hours, with 1500-1700 hours during the vegetation period.

The amount of precipitations is less than that in the micro-zones of Outer Kakheti to the West. The annual total amount of precipitations here equals to 636 mm. Average monthly amount of precipitations is the greatest in May (105mm) and is the least in the months of December-January (25-26mm). The amount of precipitations during the vegetation period is 464 mm.

The number of the days with hail (IV-X) is 1,6 on average. In the rest of the year, hail is a rare event. It hails relatively more often in May (0,7 days).

The sum of precipitations falling in the months of April, May, June and October of the warm period of the year significantly exceeds their evaporation rate and therefore, vineyards need no irrigation during these periods.

In July and August, hydrothermic coefficient is less than 1, i.e. the amount of precipitations is less than that of their evaporation and it is drought. Duration of the drought is 72 days on average. Drought starts in the first pentade of April and ends in the middle of September.

In Kakheti winds primarily blow along the Alazani gorge. North-western (29%), Western (19%), Eastern (17%) and North-eastern (10%) winds prevail here.

Average annual wind speed in the specific zone does not exceed 1,0 m/sec. Therefore, the area belongs to the wind activity zone and a principal 4-row forest windbreak should be planted by considering the winds of western and eastern directions.

Spring night frosts end towards the end of March (31.III). First autumn night frosts start in the second decade of November (12.IX). Frost-free period lasts for 225 days.

The average of annual absolute minimums of air temperature is -11 – -12°C. Once in every 10 years, minimum winter temperature may fall below -16 – -17°C. The absolute minimum in the zone is -24 – -25°C, but such cases are very rare.

SOILS

The areas to be used for vineyards are located at the foot of the North-eastern slopes of the South-eastern part of Tsiv-Gombori mountains. They are adjacent to the Southern part of the Alazani Valley, which is the aprons and slopes on the right terrace of the river Alazani slightly inclined north-eastwards.

Extreme Southern part contains Chernozem, and the Northern and the Western parts contain more the varieties of alluvial and dealluvial-proalluvial soils, which differ from one another with the thickness of profile, texture and skeleton-texture.

Thickness of the profile of the mentioned soils is mainly 0,8-1,5 m, and the thickness of active humus-containing layer is 40-60 cm.

According to texture, these soils are mainly attributed to heavy loamy and light clay types; in some sections, the soils (mainly proalluvial) are attributed to the average and light loamy types. The content of physical clay (with the faction of <0,01 mm) mainly in Chermozem, alluvial and dealluvial soils varies within the limits of 40-75%, and of 20-45% in proalluvial soils. Soils contain calcium carbonates in average and little quantities, up to 2-20%, with greater content in some sections. The reaction pH of the soil area is weak or average alkaline and its indicator varies between 7,4 and 8,2.

The humus content in the profile of Chernozem is mostly 4,5-0,5%, and that in alluvial, dealluvial and proalluvial soils is mostly 2,5-0,3%, in exceptional cases even reaching 3,0%.

The content of hydrolysis nitrogen is mainly low varying between 6,0 and 2,5 mg in 100 gr of soil, with 7–10 mg in exceptional cases. The content of soluble phosphorus is either average or low varying between 5,0-1,5 mg, represented as a trace only in some sections. The content of exchange potassium is also low or average. Sum of absorbed bases (Ca+Mg) is characterized by average or high indicators and its content in the active soil layer is 20,0-45,0 milliequivalents, reaching even higher indicators in exceptional cases. High percentage of the sum is absorbed calcium, and the content of magnesium is relatively low, but anyway is presented in significant quantities.

AGRO-TECHNICAL REGULATIONS

The following agro-technical regulations should be observed to produce wine Tibaani by considering soil and climatic conditions.

SPECIES OF RKATSITELI

Growing area: Up to 300-350 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SOIL CULTIVATION

Autumn and spring plough of soil, with minimal land cultivation. Moisture-preservation measures – preserving the soil surface in a loose state (cultivation, milling, mulching). In the irrigation area the last irrigation cycle of vegetation is to be ended one month before the vintage starts.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic regulations.

PHYTO-SANITARY REGULATION

Principal diseases: Mildew, powdery mildew, rot.
Pests: Ticks, western grape warm, mealybug.
Control measures: Applying contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF RKATSITELI

RKATSITELI

Georgian wine species of white grape giving high-quality production, with an average growing ability, abundant harvest, with the average or late than average ripening period. The average weight of a bunch is up to 160-250 gr. The fully ripened grape becomes of a beautiful color with a pinkish-bronze tint. It is quite pulpy and juicy, with pleasant sweet species-specific aroma.

Sugar content of ripe grape reaches 220-240 gr/dm^3, with the constant acidity of 5-6 gr/dm^3. Average harvest to gain high-quality wines does not exceed 9–10 tons per hectare.

WINE TIBAANI

Wine Tibaani is controlled premium-quality dry white wine of appellation of origin. It is produced with the grape of species Rkatsiteli with fully stopped must.

Wine Tibaani is characterized with dark amber colour, with species-specific aroma, extractability, velvet taste and raisins tones.

Chemical characteristics of the wine Tibaani should correspond to the following indicators:

Volumetric spirit-content, % – 11,5-13,0

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,0-6,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 18 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

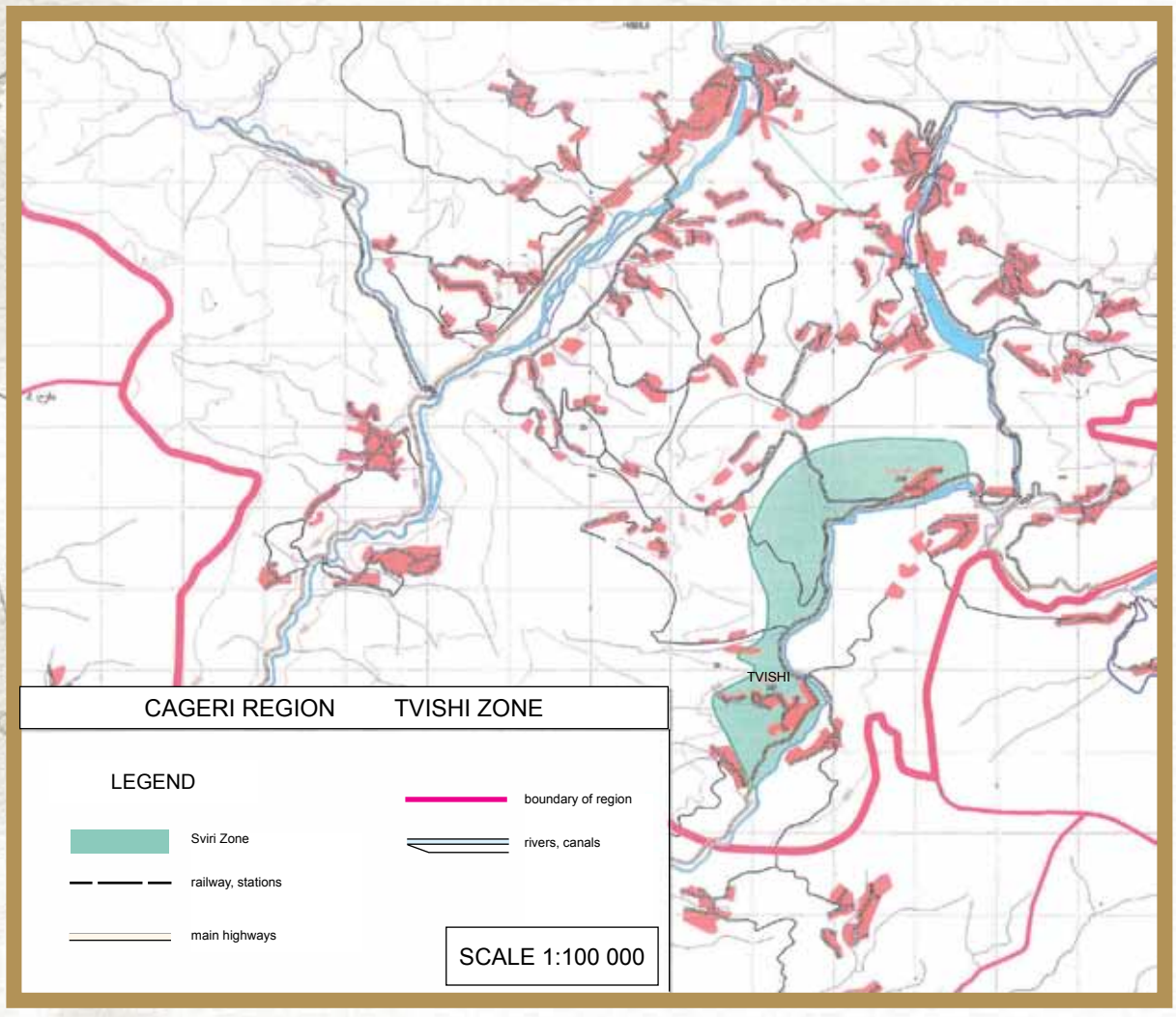
AREA OF SPECIFIC ZONES

The area of the specific zone of Tibaani is approximately 28 sq. km.

The climatic conditions, moderately humid subtropical climate, the location of vineyards at the foot of the South-eastern and the North-eastern part of the Tsiv-Gombori mountains, the originality of indigenous species Rkatsiteli and the ancient rule to make wine in the wine clay-pitches make for special features of Tibaani wine.

Tvishi

REG. №797 (10.12.2007)


TVISHI
CAGERI REGION TVISHI ZONE
LEGEND
Sviri Zone
railway, stations
main highways
boundary of region
rivers, canals
SCALE 1:100 000

Appellation of Origin of "Tvishi" Wine

GEOGRAPHICAL LOCATION

The specific zone of Tvishi is located in Lechkhumi, administrative Region of Tsageri, in the right shoreline of the river Lechkhumi, with the coordinates of the Northern latitude of 42°31' and the Eastern longitude of 42°54', at 435 m above sea level. The specific zone includes the extreme the Western foot of Racha Ridge and the Eastern slopes of massif. It includes the villages of Tvishi and Alpana.

CLIMATE

The climate is damp here, with long hot summer and moderately cold winter.

The annual duration of sunshine is 1900-2000 hours, with 1400-1500 hours during the vegetation period. Average annual air temperature is 14,2°C, with 22,2°C in August, the hottest month of the year and +0,5°C in the coldest month of January.

A stable transition of average daily air temperature above 10° takes place in the first decade of April (7.IV), and the fall below 10°C takes place in the first decade of November (2.XI). Thus, the duration of the vegetation period is 209 days. The sum of active temperatures from 3700°C. In such a case, this indicator is more than 3800° once in every four years.

Annual sum of atmospheric precipitations in the micro-zone is 1095 mm. The amount of precipitations falling in August almost equals to the amount of evaporated precipitations what indicates that in August of some years the vineyards need irrigation.

The annual number of days with hail during the vegetation period is 0,8 (Tsageri). May and June have most days with hail (0,3-0,3 days each). The total amount of fallen precipitations is more than the possible evaporation.

Due to the meridian direction of the Rioni Gorge, winds mainly blow along the gorge. Winds of South-western (22%), Southern (17%) and North-eastern (12%) directions and the winds of perpendicular direction of Northern (14%) and North-eastern (12%) prevail in the zone. Average annual wind speed is at most 1,0 m/sec. Such zones belong to the III group of weak wind activity.

Average of the annual absolute minimums of air temperature is -15°C. Once in every 10 years, the minimal temperature may fall to -20°C what will cause significant damage to annual vine sprouts. The absolute minimal temperature in the specific zone is -24°C, but such cases are very rare.

SOILS

The specific zone of the wine Tvishi is located in the Western Georgia and namely, in the hilly zone of Racha-Lechkhumi, located on the right bank of the river Rioni. In respect of relief, these places are slightly and averagely inclined slopes of various expositions with small terrace-like plains. They are mainly directed inclined the

South-eastwards and the Eastwards.

The soils are mainly represented by humic-calcareous soils with different types and varieties, which differ from one another by the thickness of profiles and humus-containing layers and texture, degree of skeletal texture and stone-forming. Dealluvial and brown soils with their varieties and types are spread on relatively small areas.

Humus-calcareous soils, which are mainly spread in the hilly zone, are characterized by great variety according to the thickness of profile, skeletal and stony texture and degree. The thickness of profile is mainly 50-80 cm, and that of humus-containing active layer is 20-40 cm. In some sections with the sharply inclined relief and with erosive processes, the soils are characterized by small thickness of profile of less tan 40-50 cm, and the thickness of humus-containing layer of not more than 15-20 cm. They are mainly developed on limestone clays and talus. According to texture, these soils are mainly heavy loamy and clay soils with the content of physical clay (fraction of <0,01mm) varying within the limits of 45-75%. In exceptional cases, these are loamy soils with the clay content of 35-45%.

Content of humus in these soils is little and amounts to 2,5-1,5% decreasing in the active lower layers of the soil. The content of main nutrient elements (NPK) is little. The content of hydrolysis nitrogen in these soils does not exceed 6,0 mg in 100 gr. of soil. The soils are also very poor in the content of soluble phosphorous, which is mostly represented as a trace. The content of exchange potassium is also little not exceeding 10 mg in 100 gr. of soil. Calcium carbonates are contained in little quantities amounting to 2-20%. The reaction of soil area (pH) is weak and average alkaline and pH indicator is 7,3-8,2.

A small area is represented by dealluvial soils, mostly spread as spots on the lower parts of slopes. These soils have relatively deeper profiles (70-100 cm) and are characterized by less content of carbonates. In some sections carbonates are fully washed-out remaining in the lower layers in insignificant quantities. According to the content of humus and main nutrient elements (NPK), these soils have low indicators, like humus-calcareous soils.

Relatively small area is represented by black soils, mostly characterized by average and small thickness of profile of 40-80 cm, and with the thickness of humus-containing active layer of 20-30 cm. According to texture, these soils are heavy loamy and clay soils with the content of physical clay of 50-70%. The content of humus in these soils is also little and constitutes 2,5-1,5% in the active layer gradually decreasing in the lower layers. The soils do not contain carbonates. The reaction of the soil area is mainly neutral and pH indicator is 6,2-7,1. The content of main nutrient elements (NPK) is also little.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce the wine of appellation Tvishi, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF TSOLIKOURI

Growing area: Up to 500-800 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 6-7 tons per hectare.

SOIL CULTIVATION

Anti-erosive measures to be undertaken on the slopes of average and great inclination: minimal and zero soil cultivation; grass-lawn system, soil mulching.

FERTILIZATION

Application of organic-mineral fertilizers under regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, anthracnose.
Pests: Ticks, western grape warm, mealybug.
Pest and disease control measures: Proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES OF TSOLIKOURI

TSOLIKOURI

Indigenous white vine species widely spread in the Western Georgia. The vine is of more than average grow and of late ripening period. It is high-yielding species. The average harvest is 6-7 tons per hectare. The average weight of its bunches is 150-160 gr. The content of sugar in the ripe grape is 200-250 gr/dm^3, with 7,5-9,5 gr/dm^3 of permanent acidity.

WINE TVISHI

Controlled premium-quality, white semi-sweet wine of appellation of origin. It is produced with the vine species of Tsolikouri with half stopped must.

Wine Tvishi is characterized with light straw to straw colour, with delicate, harmonious and elaborate taste, species-specific aroma and pleasant sweetness.

Chemical properties of the wine Tvishi should correspond to the following indicators:

Volumetric spirit-content, % – 10-11,5
Mass sugar concentration of no more than 30-50 gr/dm^3

Titrated acidity – 5,5-7,0 gr/dm^3

Volatile acids of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

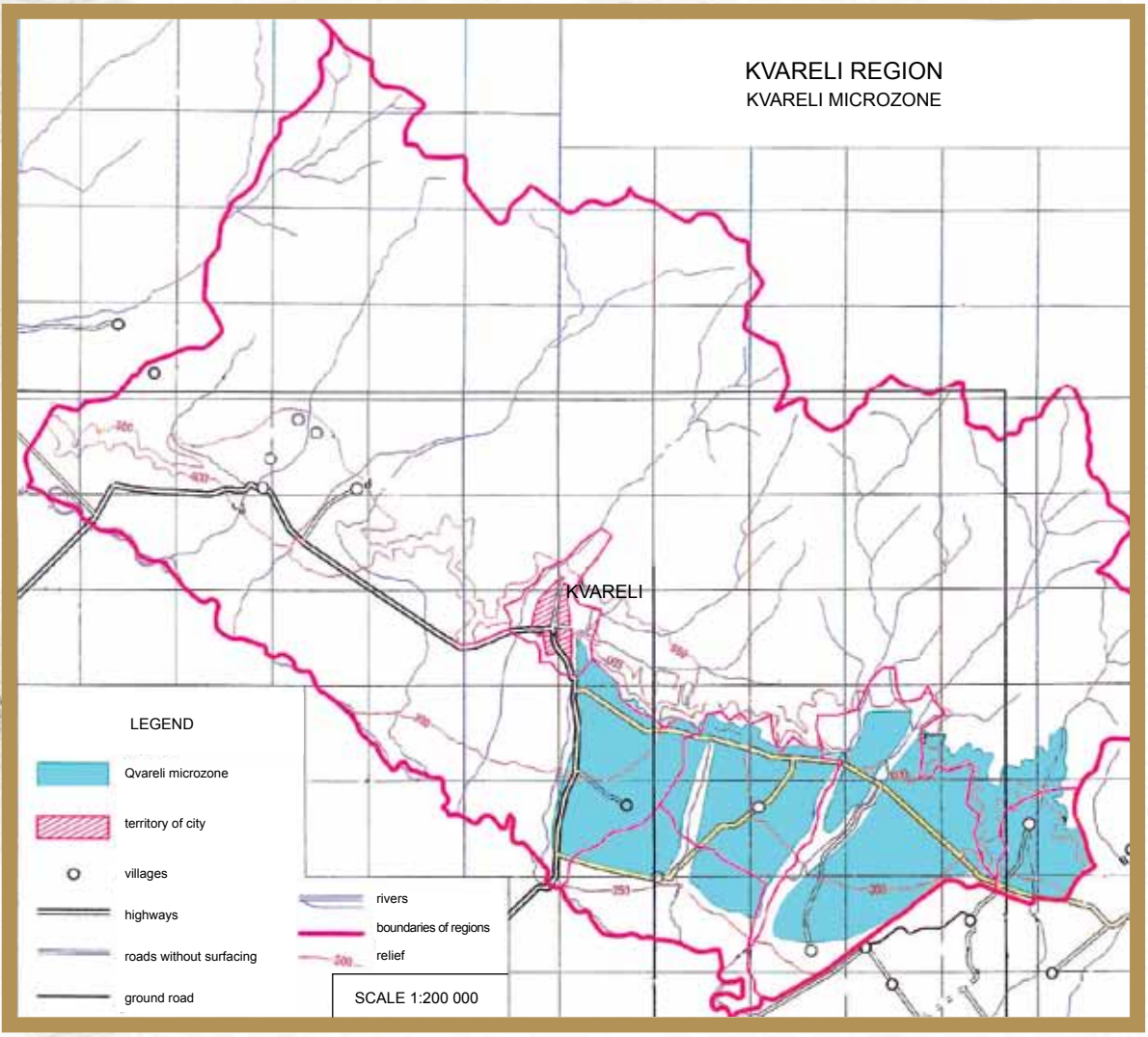
AVAILABLE AREAS FOR RAW MATERIALS OF WINE

The area of the specific zone of wine Tvishi is approximately 15 sq. km.

Special geographical location, the microclimate developed on the right bank of the river Rioni, soil varieties, species-specific aroma of the vine species Tsolikouri, pleasant sweetness and way of production make for peculiar properties of wine Tvishi.

Kvareli

REG. №798 (10.12.2007)


KVARELI REGION
KVARELI MICROZONE
KVARELI
LEGEND
Qvareli microzone
territory of city
villages
highways
roads without surfacing
ground road
rivers
boundaries of regions
relief
SCALE 1:200 000

Appellation of Origin of "Kvareli" Wine

GEOGRAPHICAL LOCATION

Specific zone of Kvareli is located in the administrative region of Kvareli, in Kakheti, on the left bank of the river Alazani (Gagmamkhari), on the left bank of the river Bursa, in Kvareli administrative region, on the Southern slope of Kakheti Caucasioni. Its coordinates are as follows: the Northern latitude of 41°58' and the Eastern longitude of 45°50'. It is located at 450 m above sea level. The foot of lowland is occupied by Alzani Plain, which elevates northwards, is transformed into the foothills zone and is adjacent to Caucasioni foot.

The Bursa and Chagurgulatskali, small tributaries flowing down Caucasioni create strong drifted cones at the point where they flow into the Alazani. The territory includes the villages of Kuchatani, Gavazi, Chikaani, Akhalsopeli and Mtis Dziri.

CLIMATE

The weather is mainly formed by the air masses developed in subtropical and moderate latitudes and displaced from the East to the West under the influence of highland system. Due to the fact that the gorge of the river Alazani is open to South-eastern direction and closed with mountains from all other sides, the air masses of North-western and South-eastern directions prevail here. Due to the fact that the gorge is closed in a special manner here the wind speed is not high.

Due to the above-mentioned processes, the given territory is characterized by moderately humid climate, hot summer and moderately cold winter.

The average annual duration of sunshine is 2050 hours, with the total solar radiation on the left side of the river Alazani less than that on the right side of the river. Annual amount of total radiation is 120 kcal/cm^2, with 97 kcal/cm^2 in the vegetation period. The sum of direct radiation is 51 kcal/cm^2, and that of the dissipated radiation is 46 kcal/cm^2.

Average annual cloudiness is 50-55%. In the periods of formation and ripening of grape bunches, the duration of the dome of the sky covered with clouds is not long (18-20 days), and the number of clear days is average constituting 15-16 days.

Average annual air temperature is quite high equalling to 12,5°C. Average air temperature of the coldest month (January) is +1,0°C, and that of the warmest months (July, August) is 23,6°C. The daily amplitude of temperatures in the warmest months is 8,5-9,5°C, and that in September is no more than 8°C. Annual amplitude reaches 23°C.

Average of the annual absolute minimums of air temperature is -11°C, and the absolute minimum is -23°C. Minimum temperature may fall to -16°C once in every 10 years.

Average of the annual absolute maximums of air temperature is 35°C, and the absolute maximum reaches 38°C. High temperature (>38°C) damaging the vine does not occur in more than 5% of the years.

A stable transition of the air temperature above 10°C takes place on the 5-th of April, and falling of temperature below the mentioned point takes place in the first five days of November (4.XI). So, the duration of the warm period is 212 days.

The first autumn night frosts start from November 21, on average. Once in every 10 years, early frosts, may take place at the end of October. The last spring night frosts in the specific zone on average end on the 26-th of March. Once in every 10 years the spring frost may last until the middle of April what is a rare event.

Total of active temperatures (Σt>10°C) on the given territories varies gradually within the limits of 4100-3700°C.

Autumn is quite warm. Average temperature of September exceeds +19°C.

Following the peculiarity of the territory, in summer and autumn, additional warm air masses flow from the territory of Azerbaijan, through Iori Upland. Therefore, it is warmer here than on the right shore. This process is hampered in Kvareli by Tsitskaant forest ridge.

Average annual sum of atmospheric precipitations is 1070 mm, with the minimum precipitations (40 mm) falling in winter (January). The second minimum (81 mm) is fixed in August. Maximum precipitations (181 mm) fall in June, with the second maximum (90 mm) in September. 805 mm of precipitations out of the total amount fall during the warm period (April-May) and 265 mm fall during the cold period (November-March). The number of days with precipitation per year is 132. According to the annual indicator, the moisture balance is negative in the months of July-September. Up to 540 mm of precipitations fall during the fruit-growing period (the 15-th of April – the 15-th of August). So, before flowering, as during the fruit formation and ripening periods, vine needs no irrigation except some exceptional cases.

Average relative humidity of air is 72%. Air imbibition is the least in summer (June, July, August) and equals to 66-64%. This indicator is relatively higher at the end of autumn and at the beginning of winter amounts to 80%. The annual number of the days with hail is 2,1 on average. May is the month with the most frequent hail (0,9 days). In April, June and July it hails equally during 0,3 days in each month.

A snow cover appears in the last decade of December (25.XII) disappearing in the middle of March.

Based of the relief, strong and intense winds are rare. The repeatability of windy days is 43%. Average annual wind speed is 1,2 m/sec. Wind speed is relatively high in March-April (1,5-1,4 m/sec). Average number of days with strong (>15m/sec) winds is 26, with 6 of them in April and May and 4 of them in June. According to the meteorological office of Kvareli, winds of Northern (28%), North-eastern (16%) and Southern (15%) directions prevail in the Region. The cold air masses flowing from high tops of the Caucasioni at night, before sunrise intensifies the danger of winter frosts and spring night frosts.

SOILS

There are varieties of alluvial soils spread in the region, which differ from one another by their skeletal structures, swamping and humidity. The soils are mainly formed and developed with the sediments drifted by the river Alazani and its tributaries – rivers Bursa, Shorokhevi, Avaniskhevi and Intsobi down the Southern slopes of the Caucasioni.

There are 7 varieties of alluvial soils spread in the region:

1. Alluvial calcareous of great thickness, loamy soil;
2. Alluvial calcareous of great thickness, weakly skeletal loamy soil;
3. Alluvial calcareous of great thickness, average skeletal loamy and sandy soil;
4. Alluvial calcareous of great thickness, strongly skeletal loamy and sandy soil;
5. Alluvial calcareous of great thickness, with the ground water standing from

the depth of 80 cm, loamy soil;

6. Alluvial non-calcareous of great and average thickness, with excess moisture, heavy loamy soil;
7. Alluvial non-calcareous of great and average thickness, logged loamy soil.

The first four varieties of soils are characterized by great thickness of profile with more than 1 meter, and the thickness of the humus-containing active layer is 50-60 cm. Differentiation of genesis horizons in the soil profile is weakly developed. The soils are characterized by loamy texture. Lower layers of the soils of the third and fourth varieties are characterized by sandy texture. Unlike them, the soil of the second variety is characterized by weakly skeletal texture and the soil of the third variety has strong skeletal texture. The soils are characterized by loose structure. The soil of the fifth variety of characterized by the ground water standing from the depth of 80 cm, and by excess moisture from the depth of 50-60 cm. According to texture, it belongs to the group of loamy soils. The soil of the sixth variety is characterized by great and average thickness of profile varying between 70-100 cm, with the thickness of humus-containing active layer of 50-60 cm. It is characterized by heavy loamy texture and excess moisture. The soil of the seventh variety is bogged right from its surface.

The above-mentioned soils are mainly loamy, with sandy texture in some of the sections of the lower layers. The content of humus in the active layer of the soil (at the depth of 50-60 cm) is average or little varying within the limits of 1,5-3,5% with a low indicator everywhere in the lower layers. The soils are poor in hydrolysis nitrogen containing only 3,36-5,02 mg of them in 100 gr of soil. In exceptional cases this indicator is average equalling to 5,3-7,2 g in 100 gr of soil. The soils are very poor in soluble phosphorus not exceeding 1,23 mg in 100 gr of soil. Phosphorus is mostly represented as a trace only. The content of exchange potassium is also low and constitutes 17,0-2,0 mg in 100 gr. of soil. The soils mainly do not contain calcium carbonates, which is represented in lower layers in insignificant quantities in exceptional cases amounting to 2,0-5,0%. Reaction of soil solution (pH) is neutral and weak alkaline and pH indicator is within the limits of 5,8-7,6. Sum of the absorbed bases (Ca+Mg) is low or average constituting 17,63-33,4 milliequivalents in 100 gr of soil. Great proportion of the sum is the absorbed calcium, with manganese in less significant quantities.

AGRO-TECHNOLOGICAL REGULATIONS

In order to produce Kvareli wine, the following agro-technological regulations should be observed by considering the soil and climatic conditions.

SPECIES OF SAPERAVI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 7-8 tons per hectare.
Urgent measures: Rationing of high-yielding buds and tearing off the tips during the phase before flowering.

SOIL CULTIVATION

Autumn and spring plough of soil. Moisture-preservation measures – preserving the soil surface in a loose state (cultivation, milling, mulching). Ending the vegetation irrigation one month before the vintage.

FERTILIZATION

Application of organic-mineral fertilizers under cartographic agricultural regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, grape rot.

Pests: Western grape warm, mealybug.

Pest and disease control measures: Using proper contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF THE SPECIES SAPERAVI

SAPERAVI

Georgian, color-grape wine species giving high-quality production. Wine made of Saperavi is of intense dark red color, with moderate content of alcohol and acidity, with rich and gay race and high taste properties.

The bunch is larger than average with the weight of 140-145 gr. The ripe bunch is of dark blue color, juicy and pulpy with pleasant sweet taste.

The grape ripens in the second half of September. The vine is stronger that of average grow. The harvest per hectare to gain the conditional production varies between 7-8 tons.

Sugar content of the ripe grape reaches 200-260 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3.

WINE KVARELI

Wine Kvareli is high-quality controlled dry red wine of appellation of origin. It is made with the grape of species Saperavi, with fully stopped must.

Wine Kvareli is characterized with dark red color, species-specific aroma, extractability, harmonicity and special race.

Chemical characteristics of the wine Kvareli should correspond to the following indicators:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars of no more than 4 gr/dm^3

Titrated acidity – 5,5-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

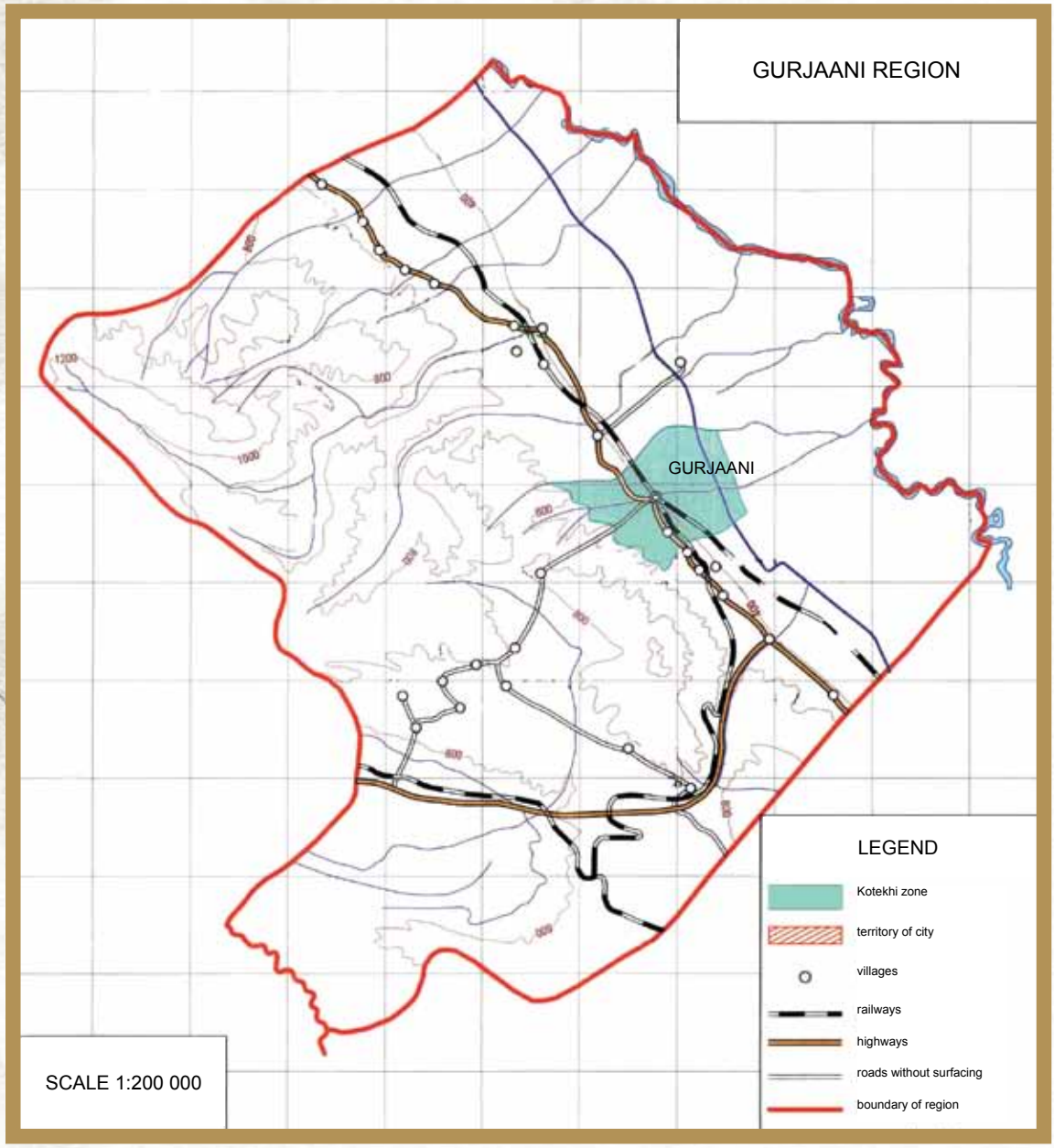
AREA OF SPECIFIC ZONES

The area of the specific zone of Kvareli is approximately 100 sq. km.

Unique properties of the species Saperavi, the microclimate created under the influence of the Caucasioni mountain range and the sediments drifted by the rivers of Bursa and Chagurgulatskali allow producing controlled high-quality dry red wine "Kvareli" of appellation of origin.

Kotekhi

REG. №799 (10.12.2007)


GURJAANI REGION
GURJAANI
LEGEND
Kotekhi zone
territory of city
villages
railways
highways
roads without surfacing
boundary of region
SCALE 1:200 000

Appellation of Origin of "Kotekhi" Wine

GEOGRAPHICAL LOCATION

The specific zone is located in the middle stream of the river Alazani, on its right bank, with the coordinates of the North latitude 41°45' and the East longitude 45°48'. The territory of the micro-zone includes the foothill adjacent to the woody slopes of the North-western inclination of Tsiv-Gombori Ridge and Alazani Valley, and is located at 250-700 meters above sea level.

CLIMATE

The weather is formed by atmospheric processes developed in subtropical and moderate latitudes and displaced from West to East. Climate is moderately damp here, with hot summer and moderately cold winter.

The annual duration of the sunshine is 2150-2200 hours, varying between 1550-1600 hours in the vegetation period. In the micro-zone, the annual sum of the direct solar radiation on the horizontal surface is 71 kcal/cm^2, the annual diffused radiation is 49 kcal/cm^2, and that during the vegetation period is 35 kcal/cm^2. The annual value of total radiation is 120 kcal/cm^2, and 90 kcal/cm^2 during the warm period.

The average annual air temperature is quite high reaching 12,4°C. The warmest months are July and August, with the average temperature of 23,6°C; the average temperature of the coldest month (January) is +0,9°C. The average of the annual absolute minimums is -10°C, and the average of absolute maximum is 35°C. Extreme temperatures are -22°C and +38°C.

In most parts of the region a stable transfer above the air temperature of 10°C takes place in the first decade of the month of April (5.IV) and the fall below 10°C takes place at the beginning of the month of November (3.XI). The duration of the vegetation period is 211 days. Approximately 3930°C of total active temperatures accumulate during this period.

The annual number of clear days (0-2 points), according to the general and lower cloudiness, is 51 and 132. During the vegetation period, this indicator according to the mentioned levels of cloudiness equals to 36 and 79 days, respectively.

The annual indicator of the cloudy days (8-10 points) is 113 and 59, according to the general and lower cloudiness, and that during the vegetation period is 54 and 26, respectively.

During 85 days from the beginning of summer, the average daily air temperature is over 20°C. During this period, for 34 days in July-August (10.VII-13.VIII), the average air temperature even reaches and exceeds 23°C.

The first night frosts in autumn start in the second decade of November (from 25.XI). Once in every ten years, the frosts may start at the end of October (from 30.X). The last night frosts on average, end of March (24.III). Once in every ten years, spring frosts are expected until the middle of April.

The annual sum of atmospheric precipitations is 804 mm, with 578 mm during the

vegetation period. Maximum annual precipitation is fixed in May (124 mm), and minimum is fixed in January (32 mm). Precipitations take the form of snow in the last days of December and disappear until the middle of March. During this period, the decade snow cover of average height of 6-7 cm does not melt for 25 days.

Average relative air humidity is 72%. The highest air humidity (80%) is fixed in November, and is the least humidity (64%) in August.

Average annual number of days with hail is 1,7. The months of May and June have most days with hail (0,6-0,4). In exceptional years, it may hail six times a year.

Following the analysis of temperature isopleths of the depth of alluvial-calcareous soil, at the depth of 5-50 cm, a stable transition of temperature above 10°C takes place in the first decade of April, and at higher depths of 50-100 cm, it does not take place until the middle of April.

In the middle of May, the temperature at the depth of 10-120 cm in soil rises over 15°C. From the middle of June until the end of September, i.e. for more than 3 months, the temperature at the depth of 5-70 cm is over 20°C.

Mainly South-western (33%) and Western (18%) winds prevail here. They are rarely changed for the eastern winds (12%). Average annual wind speed is 1,7 m/sec, with its maximum (1,9 m/sec) in March and with its minimum (1,5 m/sec) in December.

According to many-year-long data, the average of absolute minimums of air temperature, as already mentioned, is -10°C. Once in every ten years, the minimum temperature is expected to fall to -15°C (for a short period) causing only slight damage (<30%) to the vine buds.

SOIL

The soil are represented by varieties of brown, dark brown alluvial-dealluvial and alluvial-proalluvial soils.

Brown soil of great thickness, calcareous, slightly skeletal loamy-clay.

Brown soil of average thickness, calcareous, slightly skeletal loamy and clay.

Dark brown (old alluvial) soil of great and average thickness, calcareous, slightly skeletal, clay alluvial-dealluvial of great thickness, calcareous slightly skeletal, loamy.

Alluvial-proalluvial of great thickness, calcareous, slightly skeletal, loamy soils.

Thicknesses of profiles of brown and dark brown soils of great thickness is within the limits of 100-130 cm, and the thickness of humus-containing active layer is within the limits of 60-80 cm. The thickness of profiles of alluvial-proalluvial and alluvial-dealluvial soils is great at every point and is over 100 cm. The thickness of profiles of brown and dark brown soils of average thickness varies between 60-70 cm and 70-80 cm, and that of a humus-containing layer is 50-60 cm. According to the texture, the soils of the upper zone are loamy and clay. Content of physical clay (with fraction <0,01 mm) is up to 40,6-67,4%. As for the soils of the lower zone, mainly formed by displaced and drifted materials, their texture are represented by heavy loamy soils, with the same fraction of 60,0%. Their structures in the zone in trenching layers (0-50 cm) of brown soils is granular-cloddy and cloddy-granular, and the structure in the lower layers is weakly expressed. The structure in the section of alluvial soils is cloddy-granular and fine-granular-cloddy, with the lowest layers without structure.

The humus content in the trenching layers of brown and lower alluvial soils is in little and average amounts of 1,54-3.09%. The content of hydrolysis nitrogen in the upper and lower-zone soils is low not exceeding 5,60 mg in 100 gr of soil, the content of soluble phosphorus is low not exceeding 2,0 mg in 100 gr of soil, the

content of exchange potassium is also low and constitutes 2,0-7,2 mg in 100 gr of soil. The content of calcium carbonate in the section of brown soils is average or high reaching 9,2-20,0%, and not exceeding 8,0% in the lower zone. The reaction of the soil area is weak and average alkaline – pH = 7,1-8,0. The soils are weakly skeletal.

AGRO-TECHNOLOGICAL REGULATIONS

In order to gain the bulk wine Kotekhi, by considering the soil and climatic conditions, the following agro-technological regulations are to be observed.

SPECIES OF RKATSITELI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 9-10 tons per hectare.

SPECIES OF SAPERAVI

Growing area: Up to 750 m above sea level
Plot of planting: 2,0 x 1,5 m; 2,5 x 1,5 m
Height of stem: 80-100 cm
Form of pruning: Free and Georgian two-sided trellis
Norm of loading per 1 sq. m.: 8-10 buds
Harvest: 7-8 tons per hectare.

SOIL CULTIVATION

In the irrigation area the last irrigation cycle of vegetation is to be ended one month before the vintage. Autumn and spring plough of soil, with minimal land cultivation. Moisture-preservation measures – preserving the soil in a loose state (cultivation, milling, mulching).

FERTILIZATION

Application of organic-mineral fertilizers with regulations.

PHYTO-SANITARY REGULATIONS

Principal diseases: Mildew, powdery mildew, rot.
Pests: Tick, Western grape warm, mealybug.
Control measures: Application of contact and systematic preparations registered in Georgia.

ECONOMIC-TECHNOLOGICAL CHARACTERIZATION OF RKATSITELI AND SAPERAVI

RKATSITELI

Wine species of white grape. It is distinguished by high economic-technological properties, resistance in various conditions and high dignity of production. The species

is of average or late period. It is characterized with abundant harvest (average weight of a bunch is about 160-250 gr). Average harvest is 9-10 tons per hectare.

SAPERAVI

Georgian, color-grape wine species giving high quality production. Wine made of Saperavi is of intense dark red color, with moderate content of alcohol and acidity, with rich and gay race and high taste properties.

The bunch is larger than average with the weight of 140-145 gr. The ripe bunch is of dark blue color, juicy and pulpy with pleasant sweet taste.

The grape ripens in the second half of September. The vine is stronger than average grow. The harvest per hectare to gain the conditional production varies between 7-8 tons.

Sugar content of the ripe grape reaches 200-260 gr/dm^3, with the acidity of 7,5-8,5 gr/dm^3.

WINE KOTEKHI (WHITE)

Kotekhi is the highest-grade white dry wine of appellation of origin. It is made of the grapes of Rkatsiteli species with fully stopped must.

Wine Kotekhi is characterized with a light straw coloring, with species-specific aroma and pleasant taste.

Chemical characteristics of the wine Kotekhi should correspond to the following data:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,5-7,5 gr/dm^3

Volatile acidity of no more than 1,0 gr/dm^3

Mass concentration of finished extract of no less than 16 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

WINE KOTEKHI (RED)

Kotekhi is the highest-quality red dry wine of appellation of origin. It is made of the grapes of Saperavi species with fully stopped must.

Wine Kotekhi is characterized with red color, species-specific aroma and fine, pleasant taste.

Chemical characteristics of the wine Kotekhi should correspond to the following data:

Volumetric spirit-content, % – 10,5-12,0

Mass concentration of sugars no more than 4 gr/dm^3

Titrated acidity – 5,0-7,0 gr/dm^3

Volatile acidity of no more than 1,2 gr/dm^3

Mass concentration of finished extract of no less than 20 gr/dm^3

The rest norms should correspond to the legislative acts of Georgia and the EU Directive №1493/1999 of May 17, 1999.

AREAS OF SPECIFIC ZONES

The area of the specific zone of Kotekhi is approximately 14 sq. km.

The location, the micro-climate, the atmospheric processes developed in subtropical and moderate latitudes (displaced from West to East), the soils and the originality of indigenous species make for special features of Kotekhi wines.