

“MUKUZANI”

WINE OF APPELLATION OF ORIGIN

Production micro-zone of wine “MUKUZANI”

Geographical location. Micro-zone of “Mukuzani” is located in Inner Kakheti, Eastern Georgia, on the right bank of the latitudinal gorge of the river Alazani of Gurjaani Region, on northern-eastern slope of Tsiv-Gombori Ridge, with the coordinates of northern latitude of $41^{\circ}48'$ and eastern longitude of $45^{\circ}44'$, at 350-750 m above sea level. The raw material base includes the whole territories of Dedoplist 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 west to 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 east to 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 $70-60^{\circ}$, and $50-40^{\circ}$ 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 $95-100 \text{ kcal/cm}^2$ during the vegetation period. Sum of

direct annual radiation is 75 kcal/cm², and the dissipated radiation is 54 kcal/cm².

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

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° 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°. 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°, and the temperature of soil at the depth of about 40 cm reaches 24° from the middle of July to the end of August.

In the micro-zone the average annual air temperature is 12,5°. The warmest months are July and August, with their average temperature of 23,6°; the average temperature of the coldest month (January) is +1,1°. Following the many-year data, the average of the annual absolute minimums of air temperature is -10, -11°, and the average of the annual absolute maximums is 35°. Extreme temperatures are -23 and +38°.

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

The sum of active temperatures ($\Sigma t > 10^\circ$) at the altitude of 350-750 m in “Mukuzani” vine-growing micro-zone is 4120-3440°. “Saperavi” will produce the premium-quality table bulk wine of a European type (with sugar content of >21% and titrated acidity of 6,0-7,5 gr/dm³) at the amount of heat of 4000°. 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 ($w=0,4 \times 765 - 253 = 306 - 253 = + 53 = 530 \text{ m}^3/\text{ha}$, 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%).

The snow cover appears in the last decade of December (from 25.XII) and melts in the middle of March. In 74% of years, the 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° with little duration is expected what will only slightly damage the vine buds (< 30%).

Rumba winds of western (32%) and southern-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.

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 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, 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 study 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 thickness;
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: 2,5x 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 m²: 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 dryland – 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, 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 of 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/dm³, with the acidity of 7,5-8,5 gr/dm³. 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 geographical appellation. It is characterized by pomegranate color, 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/dm³

Titrated acidity - 5,0-7,5 gr/dm³

Volatile acidity of no more than 1,2 gr/dm³

Mass concentration of finished extract of no less than 20 gr/dm³

Concentration of total mass of sulphuric acid of no more than 160 gr/dm³

Concentration of free sulphuric acid of no more than 30 gr/dm³

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

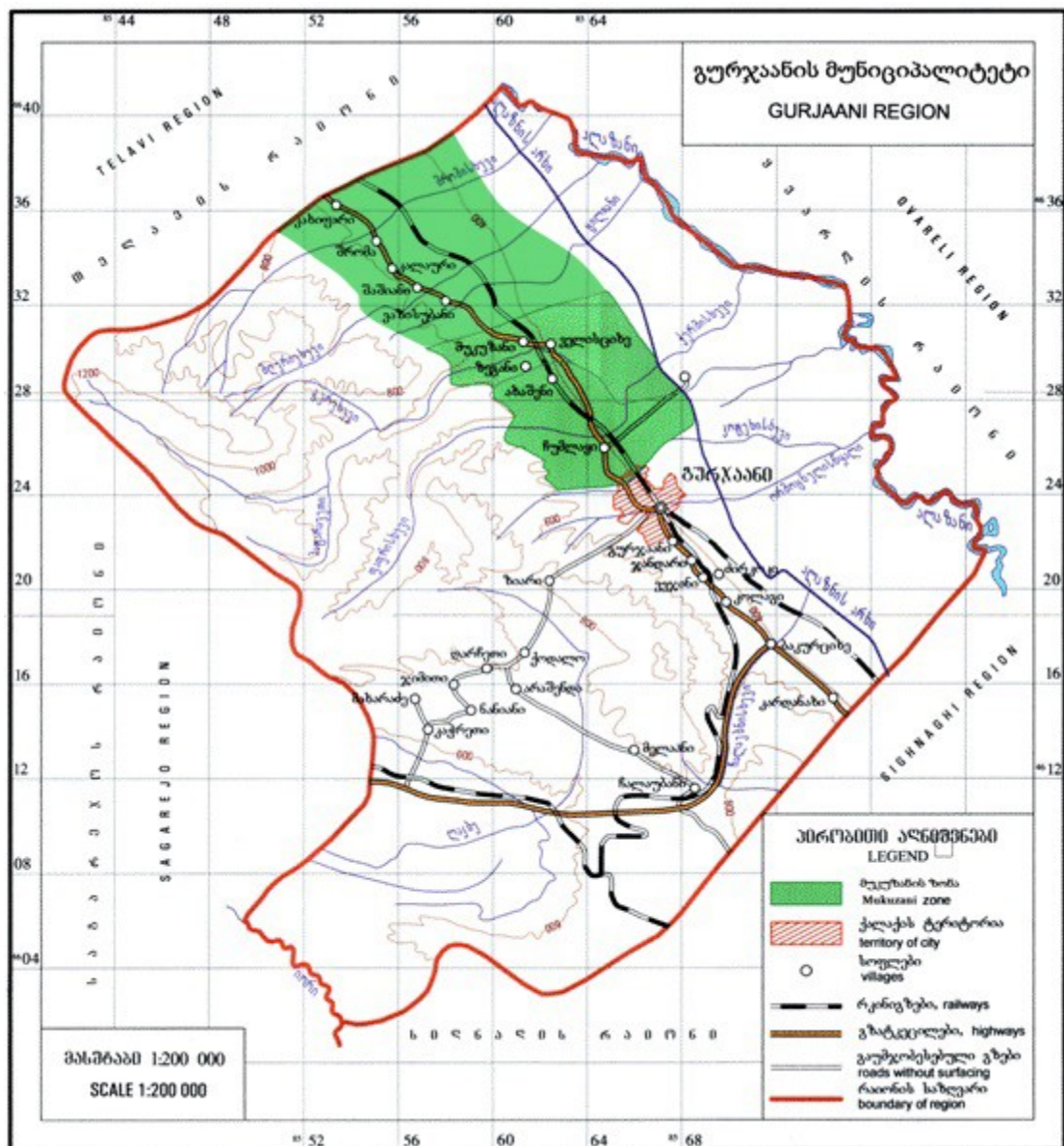
Available areas for raw materials of wine "Mukuzani"

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 decaliters out of 1 ton, 104,000 decaliters of bulk wine may be produced.

The geographical exposition of the micro-zone of "Mukuzani", northern-eastern inclination of Tsiv-Gombori Ridge, microclimate developed through cold air masses descending the peaks covered with the Caucasian glaciers,

calcareous and loessial soil clays, skeletal-alluvial deposits, ecological plasticity of the species “Saperavi” make for peculiar values of wine “Mukuzani”.



Source :
National intellectual Property Center of Georgia
<http://www.sakpatenti.org.ge>