

REPORT ON THE RESULTS OF THE STUDY TOUR TO SOUTH AFRICA SUSTAINABLE PRODUCTION OF TABLE GRAPES

One of the programs and activities of the USAID's AgBiz Program is the project on expanding the table grapes production value chain in the Republic of Macedonia.

The agreement of 15 February 2008, signed between USAID's AgBiz Program, represented by Mr. James L. Maxwell, Chief of Party, and University Lecturer Krum Boshkov PhD of the Department of Viticulture and Wine Production (FZNH), sets the following objectives to be accomplished in the first stage:

- Participation in a Study Tour to South Africa;
- Assistance to the participants in understanding the limitations to and possibilities for increasing the exporting competitiveness of their businesses in the Republic of Macedonia;
- During the study tour, assist the participants in identifying and focusing on the key objectives, activities that might prove important in the changes they may have to make in order to increase their competitiveness;
- Work with the participants in prioritizing the needs in increasing their competitiveness;
- Plan future activities for the local and international consultants to continue their work in the Republic of Macedonia;
- Report on the results of the Study Tour – knowledge gathered.

Based on these goals and objectives and my tasks under the agreement, I herewith present the following report prepared in cooperation with Lovre Ristevski, USAID AgBiz Program Financial and Marketing Specialist:

R E P O R T

Part of the activities planned under the AgBiz Program for expanding the table grapes production value chain in 2008 are target producers' study tours to countries with developed industries of table grapes production. South Africa was selected for this study tour based on the following reasons:

- South Africa is a country with developed industry of table grape production;
- South Africa is the fourth major world table grapes exporter;
- South Africa is situated in the Southern Hemisphere, which means that grapes vegetation and production take place when the grapes in the Northern Hemisphere are in the dormant period;

- Grapes are harvested from November to April, making it possible for the target groups to make the study tour and gather knowledge of the way in which the production chain works in South Africa, in a period when their own activities are not so intensive;
- The working groups can identify their priorities in the production before the start of the production cycle in the Republic of Macedonia;
- The study tour would help develop a plan for the activities covering the entire production cycle, from grapes production, through harvesting, packing, cold storage, to market research.

The Report uses and shows information and data obtained exclusively from the grapes producers, representatives of the industry, faculties and institutions study tour to South Africa in February 2008, organized by AgBiz under the wing of the USAID. All presented data is supported by photographs, video records and written materials.

Based on the interests stated by the producers' group, the issues covered are presented under the following chapters:

1. Grapes Assortments and Rootstocks
2. Climatic Conditions (selection of location)
3. Agro-techniques (soil treatment, fertilization, irrigation, and plants protection against diseases, pests and weeds)
4. Vine growing systems, supporting structures, plants spacing and ampelo-technique (application of green thinning measures)
5. Grapes Harvesting
6. Grapes Packing
7. Cold Storage
8. Grapes Market
9. Grape Growers Organization in Associations
10. Laws, Protocols, Production Standards
11. Literature, Brochures, Internet Literature
12. Characteristics of a sustainable production farm – Olyvenbosch Farm
13. Conclusions

1. Grapes Assortment

The choice of the grape variety is the primary and most important factor in the table grapes production chain. Grape bunches will attract consumers with their appearance (size, form, color, shine), specific aroma, taste (sugar content, acids, freshness, sugar and acids ratio, crispy pulp, skin thickness, pulp consistency, skin and pulp adherence) seeds or no seeds.

If a variety which is attractive to the market is to be produced the producers must meet the following criteria regarding agro-biological and economic-technological characteristics: the variety ought to be easy to grow with limited application of green thinning except for the purposes of berries dimensioning; its bunches should not require treatment or thinning but just arranging; its ripening epoch ought to fit in with the market needs; it should be able to lend itself to prolonged ripening; give high yields; have medium to high immunity to diseases and pests; endure high temperature without the skin being scorched; normal pollination of the flowers; possible late harvest; low percentage of evaporation through breathing and transpiration; high resistance to stem separation from the berry; firm skin; good transportability; allow longer refrigerator storage without skin darkening.

While seeded varieties are more savory and offer a range of aromas, there is currently bigger demand for white and red seedless varieties, marketed mainly in the English market. The seeded variety most demanded is the Red Globe.

The formation of the assortment of varieties in South Africa is a long process involving introduction and selection of varieties. Plants are imported from California and Europe. The varieties created in South Africa, now included in their grapes production, are Dauphine, La Rochelle, Bonheur, Ronell, ARC, Sunred Seedless and Regal Seedless.

The assortment is formed based on the quantities needed on the market at the moment and the type of grapes demanded. The quantities are planned by planting varieties of different ripening epochs, including earliest to latest ripening types.

Vine plants in South Africa are obtained from local grafting centers or such centers in California, USA. The rootstocks used are Ramsey, Richter 110, Richter 99, SO4 and others. Grape growers in South Africa are exploring the possibilities for prolonged ripening achieved by grafting of one and the same variety on different rootstocks. The rootstock influences with its hormones the time of ripening, prolongs or shortens the vegetation period, but also changes the other agro-biological characteristics, pollination, cluster and berries growth etc.

Prospective and recommended varieties

The majority of the table grapes producers, the representatives of the industry and institutes, recommend the following varieties:

Crimson Seedless
Thompson Seedless - Sultanina
Flame seedless
Prima

Superior
 Sagraone
 Victoria
 Michelle Palieri
 Red Globe
 Bonheur
 La Rochelle

A comparative outline of the assortments grown in Chile, the biggest table grapes exporter, and in South Africa

	South Africa	Chile
White seedless	24	39
Red seedless	8	24
Black seedless	0	2
Total seedless	32	65
White seeded	21	1
Red seeded	17	27
Black seeded	30	7
Total seeded	68	35

The assortment of the biggest exporter of table grapes in the world, Chile, consists of 65% seedless varieties and 35% seeded. The prevailing seedless varieties are the white seedless (39%) and red (24%), while the black seedless account for just 2%. Seeded varieties assortment is structured as follows: red - 27%, black - 7% and just 1% of white seeded varieties. In South Africa, on the other hand, seeded varieties account for 68% of the assortment, and 32% are seedless varieties.

2. Climatic conditions (selection of location)

Table grapes grow best in warm areas with long vegetation period and a high sum of temperatures in the year in which different varieties with different ripening epochs, from the earliest to the latest, may thrive. Table varieties are sensitive to extreme climatic conditions, low winter temperatures, late spring and early autumn frosts, hailstorms, rains during grapes ripening phase, insufficient humidity, and strong winds. Medium fertile soils are most favorable for table grapes growing. Fertile soils might lead to high density that would affect grapes ripening and quality.

3. Agro-techniques (soil treatment, fertilization, irrigation, and plants protection against diseases, pests and weeds)

South African producers do not treat the planted soil. Weeds are destroyed with herbicides. Drop-by-drop irrigation system is used, supplying fertilizers to the soil at the same time. The irrigation is also used to regulate sugar content and ripening time. The ratio between macro and micro elements to be introduced into the soil is determined by means of analyses of the soluble matters in the soil or analysis of the leaf stem. Foliar fertilizers are also used. Protection against diseases and pests is determined by advisory departments, as an obligation of the producer arising from the production

standards (ISO, HACCP, and organic production), and integral protection regulations and protocols.

4. Grape growing systems, supporting structures, plants spacing and ampelo-technique (application of green thinning measures)

4.1. Grapevine Supporting Structures - Training

Supporting structures for table varieties should ensure distance between the canes and shoots and the grape bunches, so as to ensure unimpeded application of ampelo-technical measures and handling of the grape bunches, intensive protection against diseases and pests, avoidance of scorching as well as good coloring of the skin. Pergolas (“Standard double gable/Y trellis system” and Tirol / Trentina), and tendons (“Flat roof system / Tendone / Odrina), horizontal supporting systems in which the plant shoots are trained above the wires and the grape bunches under the wires, are recommended. The vine supporting structure prevailing in South Africa is the “Y”, (Y trellis system, known as “Standard double gable”) for the less abundant varieties and “Tirol / Trentina” for the abundant varieties.

4.2. Grapevine Growing System

With the Sunred Seedless variety the „kordunica” system for short pruning is used. It consists of a trunk 1.2 m high with four arms, two on each side. The arms lie on the two main wires 30-40 cm apart from each other. 4 shoots with 2 nodes each are left on each arm, totaling 32 nodes. Bunches are thinned to leave about 20-25 bunches on one vine. With the Crimson Seedless variety „kordunica” for long pruning is used. It consists of a trunk 1.2 m high with 4 arms, 2 on each side. The arms are arranged in the space under the two main wires 30-40 cm apart. 2 shoots are left on each of the arms each with 2 nodes for replacement and 2 arches with 10 nodes, totaling 12 arches or 120 nodes on one vine. Thinning is used to ensure that there are about 30 bunches of grapes on one vine.

4.3. Plants Spacing

Plants of Sunred Seedless variety are planted in rows 3 m apart with plants in the row 1.6 m apart. There are 2,083 plants on 1 ha. The bigger spacing between the plants is suitable for more abundant varieties. Crimson Seedless varieties are planted in rows 3.5 m apart with plants 21.9 m apart, i.e. 1,500 plants on 1 ha.

4.4. Green Thinning Measures

Green thinning is performed during vegetation of the green part of the vine. The aim is to make corrections on the thinning done on ripened plants, dimensioning the foliage in proportion to grape bunches, and shaping and dimensioning the bunches. These measures have a direct and extremely significant impact on the grapes quality.

Regular green thinning measures on table grapes include pinching, shoots breaking off, cluster thinning, removing parts of the bunch, berries, girdling, defoliation, use of Gibberelic acid (GA), Cytokinin acid (CPPU) to prevent excessive cluster compactness and get larger berries, use of Ethepon / Ethrel for skin coloring and Dormex to stimulate nodes to open. The

Gibberelic acid (GA) has a very good effect on the grapes quality. Depending on when and in what doses it is used it can induce growth of the pedicels, berry thinning and berry growth to bigger size. The bunch has a well developed rachis and pedicels, easy to handle in the field and in the packing station and is very attractive to consumers. While usually applied with seedless varieties, this method can also be used with seeded varieties. The doses and the way in which it is applied depend on the variety, the phenophase, i.e. the stage of bunch development. It is applied before flowering, during flowering and at different periods of berry growth, at 2-3 mm or 7-8 mm berry diameter. The application is by means of atomizers or small pails. All these elements determine the dose of Gibberelic acid to be used.

The aim of the green thinning is to achieve a short, branchy and thinned grape bunch of about 400 grams, long and big berries, easy to be handled and packed.

The choice of varieties of early and late ripening epochs, together with the agro-technical and ampelo-technical measures that prolong or shorten harvesting time, help dimension the quantities of grapes necessary at a certain period in the market. This helps avoid long storage in refrigerators.

5. Harvesting

Grapes are harvested when they reach the technological characteristics of their individual varieties, the required size, color, aroma, taste, sugar and acid contents. In the case of certain varieties there are rules regarding the minimum contents of soluble matters in the must, and in others a regulated ratio of soluble matters and acids is also required. Harvesting is performed several times and only the ripest fruits are picked, i.e. only the bunches the technological maturity of which corresponds to the market needs. Harvesting starts early in the morning and ends at the moment when the grapes temperature in the field reaches 25°C. The picker grabs the bunch by its stem and cuts it with scissors. Then he places it in a lug the bottom of which is lined with straw, sponge, or soft thick cardboard, arranging the grapes in a single layer of bunches, stems up. The lugs are then placed on the trailer and transferred to the packing station as soon as possible.

6. Grapes Packing

6.1. Introduction

Post-harvesting activities focus on preventing loss of moisture, namely on maintaining the weight and preventing development of rot diseases.

Loss of moisture is related to breathing and breathing is related to temperature. Breathing intensity is proportional with temperature. With every 5°C increase of temperature, breathing intensity doubles. SATI research showed that the Flame Seedless variety suffers most intensive loss of moisture at harvesting (0.2%). Lesser losses are suffered during packing (0.15%) and between packing and cooling (0.03%), in pre-cooling (0.08%)

and during cooling (0.001%). Total loss of moisture is 1.6 to 2.4% for the entire technological process.

Loss of moisture is closely related to the packing speed, i.e. the time needed for the completion of the entire procedure. Losses from harvest to cooling amount to 1.6% in 12 hours, 2% in 36 hours, and 2.2% in 36 hours. Loss of moisture affects the color of the bunch stem and berries. Research has shown that if grapes are kept in refrigerator for too long, the loss of moisture of 2-2.8% is acceptable from the aspect of grapes appearance.

The strategy for successful grapes packing and storage that will help maintain grapes quality to the maximum includes the following postulates:

- Short period between picking and cold storage (12-36);
- Harvest stops when temperature reaches 25°C;
- Pre-cooling at 16-20°C, in a unit next to the packing room;
- Transport by shortest possible route between points of grapes handling;
- Temperature control and humidity in the packing room;
- Packing that will allow air circulation;
- During accelerated cooling, humidity at highest possible level;
- Temperature of about 0° C to be reached as fast as possible;
- Packing material that allows for the air to circulate.

According to Gawie Van Der Merwe, viticulture expert in CAPESPAN, packaging is the second extremely important moment in increasing the production value. A sophisticated packing of 200 or 400-500 grams top quality table grapes will be attractive to the consumers. Smaller quantities of grapes are sold at higher price compared to 1 kg of unpacked grapes. **Good packing is the magic of good sales.**

6.2. Packing Methods

All farms in South Africa have their own packing centers. Yet it should be noted that more than 50% of the grapes produced in California and in Australia are packed in the field.

A Packing Centre is a building with interconnected rooms allowing for smooth and uninterrupted movement of the grapes from one unit to another by shortest possible routes and in shortest possible time. The grapes are picked, packed and transported to packing centre in the same day. The technological process consists of pre-cooling, grape bunches trimming, precision scaling of the bunches, packaging and transport to the refrigerators.

6.3. Pre-cooling

The pre-cooling unit is next to the grapes trimming and packing section. The unit is divided into two parts, or chambers, with a metal or concrete partition between them. The two chambers are connected with several openings, their number depending on the desired cooling capacity. The space around the openings is coated with hard sponge so that the lugs press tightly against it. The lugs are then stacked, set against the sponge to the height of the opening, and covered on top with a plastic sheet. The small chamber contains a fan which sucks in the air from the chamber with the lugs. The probe at the opening measures the temperature of the air sucked in.

When not used for pre-cooling, the opening is covered with a tarpaulin. The cooling system injects cold air into the chamber with the grapes; the air hits the metal partition, disperses and spreads evenly across the room. The cold air moves through the lugs, cools the grapes and passes through the opening into the small chamber. The procedure ends at the moment the grapes reach temperature between 16 and 20 °C. Lower pre-cooling temperatures are not recommended due to water condensation when grapes are taken to units where the temperature is higher. At the moment when the probe shows the desired temperature the green indicator above the opening lights up.

6.4. Bunch Trimming

When the grapes reach the desired temperature, the lugs are transferred by means of conveyor belts to the grapes packing unit. The worker takes the lug off the conveyor belt and places it to his right. He then carefully takes every bunch, takes out all berries that do not meet the standards and places the bunch in a smaller lug in front of him. The smaller lug is then transferred by conveyor belt to the worker performing the weighing of the packages.

6.5. Measuring the Package Weight

Packing and scaling can be done in a number of different ways. If grapes are packed in small plastic boxes, the weight is precisely adjusted to 400 grams by taking out or adding parts of clusters. When packed in paper, the whole lug is placed on the scale. The weight is adjusted by combining bunches weighing approximately 400 grams. The weighed grapes are then transferred by conveyor belt to the packer.

6.6. Packaging

Weighed clusters or packages are then arranged in cardboard boxes. First perforated foil is put in place, then the bottom is lined with absorbent paper that would absorb the excess moisture, the grapes packages are stacked and covered with absorbent paper to absorb excess moisture, and on top of it sulfur paper is placed ($\text{Na}_2\text{S}_2\text{O}_5$ – sodium meta bisulphate) and finally the foil is wrapped several times. The cardboard boxes are stacked onto pallets, usually 162 on one pallet.

6.7. Forced pre-cooling

The pallets are transported to the coolers on the same day. Before storage in the refrigerators, the cartons stacked on pallets are force-cooled to temperature of 0°C. There are different types of pre-cooling systems, such as Wet Surface Cooler, Hydro Cooling etc. Forced pre-cooling systems said to be used include Bulk Storage Room, Dedicated Tunnels, Forced Cooling Tunnels, Rapid Cooler and Moveable Rapid Cooling.

7. Cold storage

The pallets with grapes cooled to 0°C are stacked in refrigerators with controlled temperature and air humidity. The basic idea regarding grapes storage in refrigerators has changed significantly over the past 10 years.

Research done and experience obtained over many years show that grapes refrigeration for more than 2 months will result in a change of their quality. Furthermore, longer refrigeration is also avoided because Northern and Southern Hemisphere grape producers cover the world market of grapes almost around the year. The time grapes are kept in refrigerators after the harvesting and before they are placed in the market is thus no more than one month, and only rarely 2 months.

8. Grapes Market

Total land under vineyards in the world in 2004 amounted to 7.9 million ha, 60% of which in Europe, and 40% of it in Spain, France and in Italy. Total grapes production is 66 billion kg, with table grapes' share in the total being 16.2 billion kg. Total table grapes consumption is 15.7 billion kg, the greatest consumers being China, Iran, Turkey, Egypt, USA, Italy, Korea, Germany, Iran and Morocco. Approximately 3 billion kg out of this total quantity of table grapes, are subject to trade. The largest importers are USA, Germany, Great Britain, Holland, Canada, France, Russia, Belgium, Mexico, Pakistan, which is to say the countries in the Northern Hemisphere, mainly those without their own table grapes production. The biggest exporters are Chile, Italy, USA, South Africa, Mexico, Spain, Turkey, Germany and Argentina, countries producing table grapes.

With 200 million kg of grapes (16 million 4.5 kg cartons) South Africa ranks fourth in table grapes exports in the world. Grapes are exported to the EU (64%), Great Britain (23%), FEA (6%), MEA (3%), USA/Canada (3%) and other places. Potential markets include China, Japan and other countries in the Far East where there is big demand for seeded black and red varieties, primarily for Red Globe.

According to AFRIFRESH Group LTD experts, successful export requires product quality control and knowledge about market demands. According to them, the first step is to establish contact with the right companies in Europe, trusted clients. The varieties produced are also important. It is necessary to know the actual state of grapes quality in a given year. Depending on market conditions and grapes quality, the price may vary between 2 and 10 Euros. They have offices in Rotterdam, Paris and in Shanghai.

According to Gawie, viticulture expert with "CapeSpan", the biggest fruit production and trade company, between themselves the Northern and the Southern Hemisphere supply the world market with grapes all around the year. Harvest in the Northern Hemisphere lasts from July to end October, and in the Southern Hemisphere from November to April. India uses chemicals to force the plants into dormancy, which results in a period between last harvest and the beginning of the vegetation lasting only 50 days. The vegetation of a part of the vineyards is projected to give fruit twice in a year. The only empty intervals in the world market are late April and late October. Production risks can be avoided and presence in the market ensured if varieties of all ripening epochs are planted, from very early to very late ripening, and if their ripening is projected according to the market needs. A higher price will be obtained with the varieties ripening later, the assortment of which does not as yet include a late ripening seedless variety.

World table grapes market sees an ever increasing competition from the developing world. The main problem for the developed countries is the high labor cost, labor being much cheaper in Chile, Peru, Brazil and India. Table grapes production is gradually being transferred to the Third World countries.

Grapes Export

A look at the exports of grapes from South Africa in 1985, 1997 and 2005 shows rapid growth from 11,043 to 46,845 million cartons (4.5 kg).

Exports in 1985 (x 1,000 4.5 kg cartons)

Variety	Number of cartons	% in exports
Barlinka	4728	42,8
Afus ali	2354	21,3
Alphonse Lavallo	1359	12,3
Dan Ben Hannah	1258	11,4
Bien Donne	336	
Queen of the vineyard	236	
Total	11.043	100

Exports in 1997 (x 1,000 4.5 kg cartons)

Variety	Number of cartons	% in exports
Thompson Seedless	4.382	22
Dauphine	2969	15
Barlinka	2332	11,6
Alphonse Lavallo	1792	9
La Rochelle	1622	8,2
Waltham Cross	1248	6,6
Bonheur	1288	6,5
Dan Ben Hannah	1025	5,2
Sunred Seedless	728	3,7
Bien Donne	382	1,9
Red Globe	725	3,7
Total	19.808	100

Exports in 2005 (x 1000 4.5 kg cartons)

Variety	Number of cartons	% in exports
Red Globe	6389	13,6
Thompson Seedless	6380	13,6
Sugraone	4708	10,1
Dauphine	4113	8,8
Prime	3736	8
Regal	2798	6
Barlinka	2487	5,3
Flame Seedless	2204	4,7
Crimson Seedless	2185	4,7
Sunred Seedless	2183	4,7
La Rochelle	2159	4,6

Dan Ben Hannah	1354	2,8
Alphonse Lavalle	1305	2,8
Waltham Cross	1267	2,7
Victoria	1138	2,4
Bonheur	956	2,0
Total	46.845	100

Seedless varieties share in 2005 exports was 33.7% with a tendency to rise in the coming years. Among the seeded varieties, Red Globe, Sugraone, Dauphine, Prime, Regal and Barlinka hold a considerable share in the exports.

9. Producers organization in associations - Andrej - SATI

Table grapes production is a high risk production due to climatic conditions, price movements in the market depending on demand and supply, etc. In South Africa, production sustainability is achieved by risk and profit sharing among all factors in the chain. 40% of the difference between the production and market price is returned to the producers. Thus the producers have sufficient capital to overcome challenges in risky years.

10. Laws, protocols, production standards - Andrej - SATI

Each country-producer of table grapes has its production related laws, protocols and standards. In addition, they may bring their table grapes production in conformity with the legislation valid in the countries to which it is exported.

11. Literature, brochures, internet literature

During the visit to CAPESPAN, Gawie van der Merwe, viticulture expert, presented all the participants of the study tour with a copy of the book *Guidelines for Preparing Export Table Grapes*.

12. Characteristics of a sustainable production company– Olyvenbosch Farm

Olyvenbosch Farm is located on the north-eastern slopes of the Paarl Mountain, in the region known as “Agter Paarl”, a part of the wider region of Windmeul. The total land under vineyards amounts to 54 ha. Table grapes are grown on 22.4 ha planted with 7 seedless and 2 seeded varieties, 4 varieties of which are white, 3 red, and 2 black. All varieties are grown on “Y” type trellis. The raising costs for one vineyard is 25,000 Euros, 6,000 Euros in the first three years and 10,000 Euros to grow it to full productivity.

Seeded varieties:

1. Victoria 1 ha
2. Alphonse Lavalle 0.9 ha

Seedless varieties

1. Flame Seedless 1.0 ha
2. Thomson Seedless 5.4 ha
3. Crimson Seedless 4.6 ha
4. Prime Seedless 2.6 ha

5. Sunred Seedless	3.2 ha
6. Autumn Royal	1.6 ha
7. Sundance	0.85 ha

Total table grapes production is about 450 tons or 20 – 25 tons/ha. 340 tons of these are packed in 75,000 4.5 kg cartons. When the packing is done there remain about 3 to 5 tons of grapes/ha on the vines, i.e. about 100 tons on the farm. These grapes are harvested separately and then processed in the local distillery. On particularly productive days the farm packs up to 2,500 cartons (each of 4.5 kg); this is done by 130 employees, 21 of whom are full-time employees. Packing and quality control follow the standards of the exporting company “Colors”. Once packed, the grapes are taken, on the same day, to the local cold storage. The farm has two 43 million liters dams, 2 wells and pumps, with which it irrigates 28 ha.

Average price of grapes packing

Number of workers	80
Daily wage	60 Rands or 333 MKD
Total for labor	26,705 MKD
Quota	112.5 kg/ 1 worker/day

A) Labor costs

Workers	Number	80
Daily wage	MKD	333
Daily norm per worker	Kg/worker	112,5
Labor costs for 1 kg packed grapes	MKD/kg	2.97
Total labor costs	MKD	26,705
Daily quota total cartons in one shift	Cartons	2,000
Daily quota for the entire shift	Kg/Day	9,000

B) Packing material costs

Carton, plastic box of 0.5 kg, two pieces of paper, foil, sulfur paper, to pack 4.5 kg of grapes	MKD	77.89
Material costs for 1 kg of packed grapes	MKD	17.31
Total costs for 1 kg of packed grapes, labor and material	MKD/kg	29.28

Movement of the price for 1 kg of grapes from vineyard to end-buyer In MKD

Grapes price before packing	19.78
Packed grapes price	34.61
Grapes price in UK market	111.27

According to Gawie, the price of 1 carton of 4.5 kg grapes is 31.27 Rands at a quota of 3,800 cartons/ha.

Marketing

- Printed matter
- Advertising
- Television
- Internet
- Personal calls
- Meetings in the company
- Seminars
- Symposia and congresses

13. Conclusions and recommendations for future activities

13.1. Grapes variety is the most important element in the production chain, followed by harvesting and trade activities.

Activities:

- Conduct research into the assortment of table grapes varieties in the Republic of Macedonia, to identify the ripening time in the different grape growing regions, establish when the grapes are placed in the market and in what quantities;
- Make a draft list of table grapes varieties for the Republic of Macedonia, according to their ripening epochs, from earliest to late, the quantities needed in the market at a given moment, and according to color (white, red, black), seedless and seeded;
- Plant collections of the proposed varieties in the best table grapes growing regions;

13.2. Climatic conditions (selection of proper location)

- Precisely determine the regions for table grapes varieties and suggest adequate fields and locations to set up new vineyards;

13.3. Agro-techniques (soil treatment, fertilization, watering, and plants protection against diseases, pests and weeds)

- Research possibilities for grapes ripening management by means of adequate irrigation and fertilization;
- Study the drop-by-drop system of irrigation and fertilization of table grapes;
- Develop scale of norms for production of table grapes trained on trellis and tendone.

4. Grapevine training systems, supporting structures, plants spacing and ampelo-technique (application of green thinning measures);

The most suitable systems for table grapes training are the pergolas ("Standard double gable/Y trellis system" and Tirol/Trentina), and Tendone ("Flat roof system/Tendone/Odrina).

Activities

- Conduct a comparative study of the pergolas costs and tendone costs and make recommendations regarding their use,
- Carry out tests, research possibilities for application of ampelo-technical measures to project yields and quality of grapes. **The aim of the green thinning is to achieve a short, branchy and thinned grape bunch of about 400 grams with long and big berries, easy to be handled and packed.**

5. Grapes harvesting

- Establish the time of grapes harvesting, the quantities going to the market and the possibility for prolonged harvest, as well as different ways of harvesting.

6. Grapes packing

According to Gawie, the type of packing (cartons and small plastic boxes) is the second most important factor after grapes quality, considerably increasing grapes price in the market. Grapes are packed in small plastic boxes or packaging paper, each package weighing 200 or 400-500 grams. In the market, in the supermarkets, these smaller boxes reach higher price than 1 kg of unpacked grapes.

Activities

- Have cartons made and used, determine the type, thickness, firmness, handling, decoration, distinctive signs, images, manufacturer's symbol.
- Have decorative plastic boxes and paper made and used and follow market reaction to these.
- Adjust wood lugs used in the Republic of Macedonia in combination with decorative packaging.
- Look into the different models of packing centers and their use in the Republic of Macedonia – with Andrej -- SATI.

7. Cold Storage

In cooperation with Andrej – SATI, prepare feasibility studies on the possibilities and the way of cool rooms operation in the Republic of Macedonia.

8. Grapes market

- Regional and European markets research - prices, demand, production standards, laws;

9. Producers' Organization in Associations

Activities

- Organize associations of producers and traders in a way that will ensure producers' share in the profit realized in the market.
- Organize lectures and presentations by Andrej – SATI, on the way South African producers and merchants are organized;

10. Laws. Protocols, production standards

Activities

- Examine South African legislation with Andrej - SATI;
- Have EU legislation translated;
- Harmonize the legislation of the Republic of Macedonia with that of the EU;
- Introduce standards of hygiene and table grapes production quality in the Republic of Macedonia, or the standards of the countries-potential importers.

Literature, brochures, internet literature

Activities

- Form a library of books, scientific and agricultural magazines, brochures related to table grapes production with web sites where producers can get information on latest developments in table grapes production;
- Set up associations' web site, or individual web sites for each company-producer in the Republic of Macedonia.

11. Factors in the shaping of a sustainable table grapes production

Table grapes sustainability in South Africa is ensured through a united action of the three factors: grapes producers, industry and market. Each of them strives to be the best in what they are doing:

1. The producers produce grapes of highest quality, attractive to consumers, with big berries and a bunch mass of about 400 grams, easy to handle and pack.

2. The industry strives to ensure best grapes packing, maintain grapes quality during cold storage, transport the grapes in shortest possible time and find markets. A sophisticated packaging of 200 or 400-500 grams of grapes of extremely high quality is attractive to consumers. Grapes packed in smaller packaging reach higher prices than as 1 kg unpacked grapes. **Good packaging is the magic of good sales.**

3. The market strives to sell the grapes at the right time and at the highest price.

4. These three factors function as one single body. They are all driven by the possibility for profit.

5. Production sustainability can result also from even profit distribution. 40% of the difference between the production and market price, i.e. of the net profit, can be returned to the producers. This possibility for additional earnings will make the producers financially stronger and open possibilities for them to introduce innovations and invest in the production, while making it possible for them to survive in the years when the production might encounter high risks or prove to be unprofitable.

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