RESEN/PRESPA APPLE QUALITY MANAGEMENT REPORT

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1. BACKGROUND

During July 2012, Mr. Slaven Aljinović visited the Republic of Macedonia as the consultant on the process of maintenance of the apple quality throughout the production and postharvest cycle. The main objective of this activity was to support the small apple producers in the main production region Resen/Prespa area. Given the expansion of apple production in other areas of Macedonia, the Bitola and Valandovo apple production regions were also visited.

Based on favorable natural conditions the Republic of Macedonia has a strong tradition in apple production. The main production regions are located in the Resen/Prespa and Polog regions, with newer orchards expanding in areas of south-eastern Macedonia (Valandovo).

The total Macedonian apple production in 2010 was 121.000 tonnes out of which more than 80% is produced in the Resen/Prespa region. The most important apple varieties are Idared (65%), Golden Delicious (10%), Red Delicious (10%), Granny Smith 5%, and 10% others. The Resen/Prespa production area covers 3500 hectares, with cca. 2000 registered apple producers. Most producers own 1-2 hectares of apple orchards. Even though these orchard provides a significant income, most producers can be considered as part-time farmers. Given these facts, the apple production has a great significance for the sustainable rural development of the Resen/Prespa region.

Most of the Macedonian apple crop is traditionally exported to neighboring countries (cca. 70% of total crop). In recent years exports to the Middle Eastern markets have also developed.

Since the success of modern post-harvest technologies is dependent on receiving excellent quality fruit for storage, assessment was made of the whole “Apple Quality Management System (production, storage and marketing practices)”. As part of such activities, field visits to the Resen/Prespa, Bitola and Valandovo regions were organized during which a series of interviews were conducted with leading producers, traders/exporters, plant nursery owners, and academic staff. The findings of this research is presented in this Report.

2. APPLE QUALITY MANAGEMENT SYSTEM

2.1 Orchard Production

The Resen/Prespa apple production is mainly based on older orchards predominantly planted on the MM106 rootstock (with an density of 800-1000 trees), with the M9 rootstock rarely used. The large majority of producers use non-certified plant material, or even on-farm grafted seedlings. In order to secure higher yields of high quality apples, a major challenge regarding orchard production is the need to gradually replace the existing older orchards with higher density production systems based on the M-9 rootstock and certified plantlets. A couple of producers have imported plant material from Greece and/or Serbia, but most of this material is of low quality, sometimes even not corresponding to the issued Plant Certificate.

Given the fact that high quality „certified plantlets“ are the foundation of a successful apple orchard, a major effort needs to be carried in order to ensure that producers start using such plant material. Achievement of this goal is possible only with strong support from the GOM/Ministry of Agriculture, and could consist of promoting the use of certified plant material through targeted subsidies. Based on such Government support this needed shift could become massive in a relatively short time, ensuring orchards with higher production yields and higher fruit quality.

High Density Apple Orchard

Regarding the variety selection, the main variety grown in the Resen/Prespa is Idared (65%) followed by Golden Delicious (15%). The preference of Idared is due to the

fact that this variety was promoted in ex-Yugoslavia as less demanding regarding production technology and postharvest management. However, it is important to stress that Idared has a minor market share on the high-end EU markets

Most orchards have irrigations systems installed, but majority of producers do not use modern technology regarding irrigation management (e.a. tensiometers). Regarding securing optimal tree nutrition, fertigation is also not applied. Fruit yield management through chemical apple thinning is done by only a few producers. This results in in high level of alternate bearing. Tree canopy management techniques, which control fruit tree load and fruit quality are also outdated. Despite the fact that hail damage is common, hail nettings are not used.

South Tyrol High Density Apple Orchard with Hail Netting

A major goal during harvest is to ensure that picked apples are at their optimal maturity stage, in order for them to be suitable for longer term storage and application of modern postharvest technologies. Another goal during harvest is to avoid improper picking practices that may declassify apples into the “Industry category”.

Harvest Damage - Fingerprints

Currently the Resen/Prespa apple producers, with a few exceptions, do not use modern tests to assess fruit maturity prior to harvesting (e.a. starch, sugar, firmness tests). This situation is determined by the fact that their buyers (traders&exporters)

have established as the basic fruit quality parameters, fruit color and fruit size. The choice of such quality parameters reflect the fact that Resen/Prespa apples are not stored for longer periods, as well as the fact that most apple sales/exports are to markets with lower quality standards.

A major challenge in the future will be to establish “Fruit Maturity Tests” appropriate for the Resen/Prespa region, and that will be based on the postharvest management regimes of modern storage facilities

The other area of apple quality management that needs to be improved is education of producers/harvest crews on proper picking techniques, transportation, and introduction of modern harvest equipment.

Fruit Picking Platform

Canvas Picking Bags

The above outlined current production technology and level of knowledge, is reflected in a low average yield of 25 tonnes/hectare. The potential for improvements in orchard management is significant given the fact that similar, but better managed, orchard production systems in other countries produce 40-50 tonnes/hectare.

In order to ensure an systematic approach towards orchard management improvement in the Resen/Prespa area, an „Apple Production Standard“ could be developed and implemented. Such an „Apple Production Standard“ would be the base for the implementation of production technologies that would result in achieving apple yields and quality comparable to those in leading apple regions in the World.

Ensuring orchard management practices that will result in high quality apples being delivered to storage facilities, is the basic precondition for successful postharvest management.

2.2 Postharvest Management

The lack of modern storage/packing facilities is a major restrictive factor in achieving higher quality of Resen/Prespa apples. Currently there is only an estimated 7000 tonnes capacity of storage facilities that provide “Regular Atmosphere (Temperature and humidity control)” in Macedonia. Most of them are situated within the premises of companies established during ex-Yugoslavia. Controlled atmosphere storage facilities (ULO & DCA) are non-existent.

Regarding on-farm apple storage, only a couple of producers have installed small storage facilities within their farms (100 tonnes capacity).

On-farm storage facility – Bistrica/Bitola

As a result, 90-95% of the Resen/Prespa apples are stored in traditional storage facilities such as old cellars, stables or farm bulidings. Due to such storage conditions, most apples are stored only till March, with some Idared stored till mid-May. As a result of the low quality of traditional storage facilities producers loose up to 40% of their stored apples.

One of the main restricting factors regarding Resen/Prespa apple quality is the non-implementation of modern methods for determination of the optimal harvest windows for different apple varieties. Currently the main quality factors determining the harvest windows are tradition, color and caliber. Such local “Quality Standards (color and caliber)” reflect the fact that Macedonian apples are exported to markets that are less demanding in regards to fruit quality (main requirements are that the fruit has nice coloring and is of acceptable caliber).

Based on the color quality parameter, producers prolong their harvest up to 30 days (end September to end of October), which in many cases results in harvesting over-mature apples. Apples with such initial lower quality, even when stored in modern storage facilities, have a significantly reduced storage period and higher postharvest losses. This situation significantly limits the marketing/export possibilities of local traders/exporters.

Therefore the first step in improving the quality of Resen/Prespa apples would be to establish of “Harvest Protocols” that would be based on the introduction of advanced fruit maturity testing (i.e. starch, sugar and/or firmness). However, it is important to stress that the introduction of “Harvest Protocols” should be market driven, rather then being an isolated education exercise. Ideally the Resen/Prespa traders/exporters would recognize that in order to improve their postharvest management and/or export to non-traditional markets they are to be the driving force behind this crucial change.

The other major activity that the Resen/Prespa apple producers and traders/exporters could undertake would be to, based on their “Development Strategy”, lobby with the Ministry of Agriculture for the establishment of programs that would co-finance investments in of modern storage/packing facilities.

Long-term ULO Storage Facility

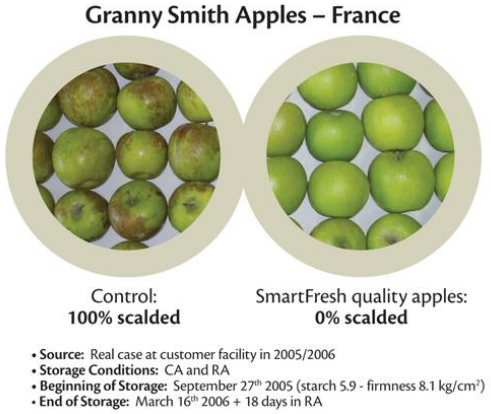
Apple Packing Facility

Only with such modern storage facilities can the Resen/Prespa exporters preserve the high quality of incoming apples for longer periods, and export them when global apple prices are high. A reflectance of the current lack of such modern storage/packing facilities is the fact that latter in the season Macedonian supermarket chains mainly market imported apples.

Skopje supermarket (July 2012)

Once such modern storage facilities are established, the application of additional postharvest management technologies such as SmartFresh will become feasible.

SmartFresh is used to control the apple ripening process during storage by minimizing the effects of ethylene on fruits. Besides enabling long-term storage, SmartFresh is also effective in controlling postharvest defects such as „Superficial Scald“ and in prolonging the apple shelf-life after room opening.



SF Control of Superficial Scald (Granny Smith – France)

However, expected results with SmartFresh can only be achieved if incoming apples have optimal maturity indices, determined by using fruit maturity tests (i.e. starch, sugar, firmness).

Therefore, education of producers on harvest management/harvest protocols has to be a priority, since high quality of incoming apples are the basic precondition for the successful operation of modern storage facilities/packing houses.

Smartfresh Presentation - Resen

3. KNOWLEDGE TRANSFER

Given the fact that advances regarding apple fruit quality and orchard productivity depend on introducing new orchard technologies, the establishment of an effective knowledge transfer system for the Resen/Prespa apple producers is of utmost importance.

In their interviews producers stressed that currently the Agricultural Extension Service does not fulfill this role. Therefore they are left on their own to try and advance their production based on the „Learning from Mistakes“ method.

Due to the fact that the Ministry of Agriculture does not financially support the field work of the Skopje Agricultural Faculty staff, their contribution to the knowledge transfer is mainly limited to larger producers who can pay for consulting services. In order to further strengthen the knowledge transfer system, the Ministry of Agriculture could establish additional financial support for the Skopje Agricultural Faculty.

“Agricultural Research Stations”, that existed in ex-Yugoslavia, and at that time were pioneers in introducing new orchard technologies, have also been closed down. Given the fact that such research facilities exist in all major apple growing regions in the World, the Ministry of Agriculture could support their re-establishment in Macedonia.

4. MINISTRY OF AGRICULTURE SUPPORT

The current situation regarding apple quality management largely reflects the fact that the Resen/Prespa apple industry has not defined its strategic development goals. It seems that the positive developments currently happening are isolated and incidental.

Therefore, in order to ensure the successful development of the Resen/Prespa apple industry, the priority could be for the Ministry of Agriculture to facilitate the formulation of a „Resen/Prespa Apple Industry Strategy“. All major stakeholders (producers, traders and Ministry of Agriculture), should be involved in this activity, with the “Strategy” being the base for the development of a strong partnership between them. The region of South Tyrol in Italy, is an excellent example how through the execution of a well formulated strategy, and partnership of all its stakeholders, global leadership can be achieved.

Besides this, the Ministry of Agriculture through it rural development/subsidy programs could establish financial measures/programs that will support farmers education/knowledge transfer, usage of new orchard management practices (e.a subsidizing the use of certified planting material), as well as support the establishment of modern storage and packing facilities.

The urgency for the Ministry of Agriculture to initiate such actions is stressed by the fact that during the last 5 years massive plantings of modern apple orchards have been taking place in Albania, Kosovo and Bosnia & Herzegovina. As a result their domestic apple production may soon replace Macedonian apples on these markets. In the end result this could result in a significant decline of Macedonian apple production and exports.

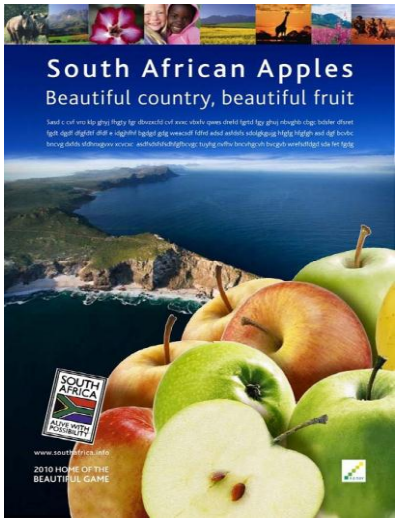
5. APPLE QUALITY – PRECONDITION FOR EXPORT DEVELOPMENT

Based on the current apple quality standards and varieties Resen/Prespa apples are primarily exported to traditional markets in the region, such as Albania, Serbia and Bosnia&Herzegovina. These low-end markets give much less emphasis on varietal choice or higher fruit quality.

However, during the last 5 years fruit distribution channels in the region have been rapidly changing, with major local and EU based supermarket chains increasing their share of fruit and vegetable markets. Illustrative of such change is Croatia, where within the last 5-6 years supermarket chains expanded from 20% to 70% of the fresh produce market share. It is also important to stress that EU based supermarkets have well established trading partnerships with major apple producing companies, such as VOG in Italy (producing 650,000 tonnes of apples). As a result of such development, Resen/Prespa apple producers may soon be faced with an increasing competition in their traditional export markets.

The other major challenge for the Resen/Prespa apple industry is to develop exports of new apple varieties that can be exported to non-traditional, more demanding global markets.

Based on a strong “Apple Quality Management System”, Resen/Prespa apple producers could develop well recognized apple brands such as the Italian “Melinda”, and/or used as the base for the global promotion of Macedonia.



6. CONCLUSIONS AND RECCOMENDATIONS

The apple production and postharvest management in the Resen/Prespa region is characterized by older type orchard production systems and a lack of modern storage/packing facilities. This situation severely limits the possibilities regarding apple quality improvement.

Therefore, in order to ensure the sustainable development and export expansion of the Resen/Prespa apple industry, major changes need to be initiated in the following areas:

1) Implementation of modern orchard technologies – This activity would include the implementation of an educational campaign that would be based on meeting production requirements defined in the “Apple Production Standard”. Through it rural development/subsidy programs the Ministry of Agriculture could support the establishment of improved production by co-financing needed investments (hail nets, harvesting equipment, irrigation expansion, certified planting material, etc.).

2) Establishment of modern storage and packing facilities - The Ministry of Agriculture through its rural development programs could support investments in modern storage and packing facilities. Without such facilities, Macedonian apple exporters can not meet the market quality standards of non-traditional high-end markets, and can not market apples when their prices are at their peak.

In regards to the above outlined challenges, the AgBiz Project can play a crucial role of facilitating the needed changes through:

1) Organization of Study Tours – “Interpoma”, the World leading apple industry show is taking place in Bolzano/South Tyrol in November 2012. A visit to this show would be an excellent opportunity for the Macedonian producers and traders/exporters to get an insight on the most advanced orchard technologies, plant varieties, postharvest and packing equipment.

2) Establishment of Orchard Demonstration Models – The AgBiz Program could support the establishment of “Demonstration Models” with selected producers. These could consist of helping introduce modern orchard management tools such as:

   - usage of “Plant Growth Regulators”,
   - establishment of planting of high density dwarf rootstock plantings
   - importation of certified plantlets from leading EU nurseries,
   - new types of liquid fertilizers (used in fertigation)
   - procurement of harvesting equipment (canvas picking bags, box-pallet bins)
   - procurement of equipment (penetrometers/firmness testers, refractometers) used in fruit maturity testing

3) Establishment of Storage Demonstration Models – The AgBiz Program could support the implementation of fruit maturity testing on a pilot orchard. In partnership with traders/exporters these apples could be stored in modern storage facilities, and the packout results of this room compared to other rooms containing apples that were harvested based only on the color and caliber quality parameters.

4) Formulation of the „Resen/Prespa Apple Industry Strategy“ – The AgBiz Program could facilitate the formulation of this strategic document that would define the longer-term development goals, strengthen partnership between all stakeholders (producers, traders/exporters and Ministry of Agriculture), as well as be the base for defining future Ministry of Agriculture support measures for the Resen/Prespa apple industry.

APPENDIX 1. – List of Contacts

	Resen
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2	Stojce Kamburovski
3	Kire Ileski
4	Dimitar Buzlevski
5	Dragi Buzlevski
6	Ilce Angeleski
7	Zoran Tanaskovski
8	Kice Damovski
9	Damjan Damovski
10	Rumko company
	Bitola
11	Vasil Manivilovski
12	Goran Trajkovski
13	Stevce Manivilovski
14	Dushko Nikolovski
15	Vasko Andonoski
	Valandovo
16	Progagro company (Aleksandar Zajkov)
	Štip
17	Ovoshtar company (Bojance Stefanovski)
	Agricultural Faculty Skopje
18	Prof. Marijan Kiprijanovski
	Farmers Federation Republic of Macedonia
19	Andrija Sekulovski