

TABLE GRAPE VALUE CHAIN STUDY AND ACTION PLAN



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List of Acronyms

AAFA	Access to Agriculture Finance Activity
ACED	Agriculture Competitiveness and Enterprise Development Project
ACSA	National Agency for Rural Development
ADP	Agribusiness Development Project
ATP	Autonomous Trade Preferences
BSPs	Business Support Providers
BY	Belarus
CCM	Cold Chain Management
CEFTA	Central European Free Trade Agreement
CIS	Commonwealth of Independent States
EU	European Union
EUROSTAT	European Commission Statistics Division
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Statistics Division
GlobalGAP	Global standard in Good Agriculture Practices
HACCP	Hazard Analysis and Critical Control Points
HVA	High Value Agriculture
IDSPs	Investment Development Support Providers
IFAD	International Fund for Agriculture Development
IPM	Integrated Pest Management
LSTTA	Local Short Term Training Assistant
MAFI	Ministry of Agriculture and Food Industry
MAGPE	Moldovan Association of Grapes Producers and Exporters
MCA	Millennium Challenge Account
MIEPO	Moldovan Investment and Export Promotion Organization
OECD	Organization for Economic Cooperation and Development
PHH	Post-harvest Handling
RO	Romania
RU	Russia
SCPVTR	The State Commission for Testing and Registration of Plant Varieties
ToTs	Training of Trainers
TA	Technical Assistance
TG	Table Grapes
TGVC	Table Grapes Value Chain
TOC	Theory of Constraints
UA	Ukraine
UNCOMTRADE	United Nations Commodity Trade Statistics Database, Statistics Division
USAID	United States Agency for International Development
VC	Value Chain
VCSC	Value Chain Support Centre
WB	World Bank
WTO	World Trade Organization

Executive Summary

The Moldovan table grapes sector offers an important vehicle for income generation in rural Moldova. It is Moldova's third largest high value agricultural (HVA) export product by value after apples and nuts, accessing a growing regional market.

The scope of this table grape value chain analysis is to present practical recommendations for interventions and improvements where required. This report is designed to be of value to i) Growers; ii) Nurseries; iii) Traders; iv) Exporters; v) Input suppliers; vi) Service providers; vii) Research institutions; viii) the Ministry of Agriculture and Food Industry and ix) ACED project staff.

The existing table grape production technologies in Moldova are traditional, insufficiently specialized, and similar to those applied for wine varieties. The current distribution channel for Moldovan fresh produce in the regional export market is limited to the open air truck (wholesale) markets. Moldovan products are visually unattractive when compared to products from other countries. This poor appearance limits their value, particularly in export markets. The growing supermarket segment in export markets requires a minimum quality to get in the door, which few if any Moldovan producers could currently meet. In order to bolster their position in this critical market, Moldovan producers will need to consolidate their efforts and adapt their products and overall marketing strategy. Growers, traders and exporters will need to work together in a more integrated and coordinated manner in order to successfully compete against key competitors (who are better coordinated and use more advanced technology).

The key constraints identified in the analysis are related to volume, quality and value. Key constraints include suboptimal: i) Produce cosmetic appeal; ii) Produce shelf life; iii) Productivity; iv) Volume and quality uniformity and v) Food safety.

The Moldovan table grape value chain actors (input suppliers, growers, traders and exporters) will need to upgrade the following in order to increase net sales and incomes:

- i) The flow of marketing information related to how the produce should look, the most demanded and most profitable varieties, the markets offering the best opportunities, and information about competitors;
- ii) Production according to market requirements (varieties, colors, sizes, weights, proper use of plant protection);
- iii) Consolidation of high quality produce volumes with small growers organized into group marketing entities;
- iv) Post-harvest Handling by using improved storage technologies and adopting forced air cooling of produce to prolong shelf life; and
- v) Compliance with food safety requirements and the minimum acceptable level of pesticide residues in key markets.

Due to ACED interventions such as training and demonstration activities, farmers will increase the quality and uniformity of table grapes being produced. Currently there is a lack of facilities for sorting, packing and properly storing table grapes. Modern design facilities have recently been built or are currently under construction across Moldova. But lack of humidity control, non-existence of pre-cooling rooms and lack of loading dock patios still remain problems. This is one of the areas in which ACED will be engaged since accessing export markets with higher quality produce is going to require such facilities. In an effort to bolster Moldova's food safety credibility, ACED will equip the central phytosanitary laboratory with modern equipment and provide training and capacity building to lab staff and inspectors based on European and Mediterranean Plant Protection Organization (EPPO) standards and guidelines.

ACED will focus on identifying clear opportunities for collaboration and cooperation among value chain entities and providing assistance to take advantage of these opportunities through joint action. Joint efforts could help value chain actors meet large supply contracts, make investment in post-harvest infrastructure, take advantage of economies of scale, and implement transfer of technology activities. A key partner in all of these activities will be MAGPE, whose capacity will be strengthened over the next five years. A more detailed action plan can be found in Chapter IV, followed by a causal model detailing expected outcomes and impacts from work in this sector in chapter V.

Methodology

The Table Grape Value Chain Analysis was carried out during August – October, 2011. There were three main phases of Table Grape Value Chain Analysis:

1. Determining what constitutes “Value” for table grape consumers. For this the Russia and Romania End Market Studies were conducted by ACED staff in September and October, 2011.
2. Mapping the current state of Moldovan table grape value chain- including participants, processes and linkages determined by material and information flows.
3. Analyzing value chain constraints to providing “Value” to the end markets and recommending improvements needed as well as ACED interventions.

The process included meetings and discussions with table grape value chain participants, including meetings at cold stores and vineyards. The team of authors collaborated with such institutions and organizations as: Ministry of Agriculture and Food Industry (MAFI); the Moldovan Association of Grapes’ Producers and Exporters and the Institute of Applied Science in Horticulture and Agri-food Technology. The key informants for the analysis were private companies, family farms, public institutions and associations. These interviewees can be categorized as: i) Table grape producers; ii) Nurseries; iii) Traders; iv) Exporters; v) Input suppliers; vi) Service providers; vii) Researchers; and viii) MAFI – the Grapes and Wine Market Policy Department. Privacy and information confidentiality was assured. The list of key informants is attached in Annex 5.

An invaluable contribution was made by Mr. Vasile Biesu, the Director of the Moldovan Association of Grapes’ Producers and Exporters (MAGPE) who shared years of experience and knowledge generously. MAGPE provided up-to-date information and data as well as valuable contacts of value chain participants (association members) to be interviewed.

The main sources of trade and production data were represented by online electronic databases such as: i) FAOSTAT; ii) UNCOMTRADE; iii) EUROSTAT as well as existent foreign and local Market Information Systems such as: FruitInform (Ukraine) and AgraVista (Moldova).

Table Grape Value Chain Analysis in Moldova was developed according to the following steps:
i) Preparation work including background desk research; ii) Interviews with VC participants; iii) Data collection; iv) Analysis and writing, team review and discussion.

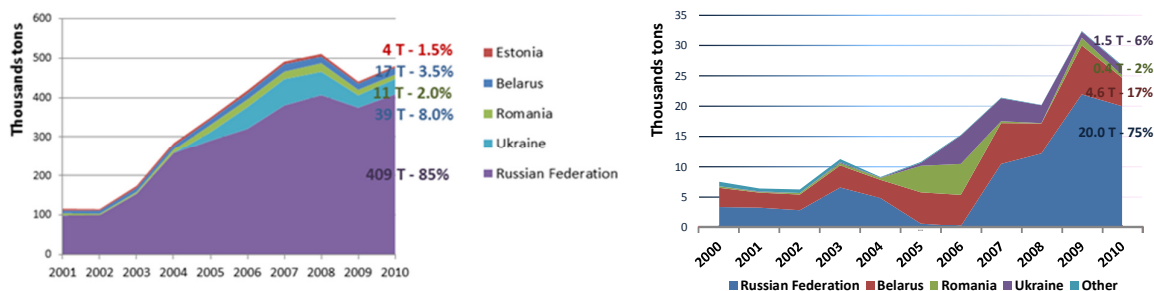
Chapter I: Moldovan Market for Table Grapes

1.1 Key Regional Markets

The key markets for Moldovan table grapes are Russia, Ukraine, Belarus, and Romania. Moldova also exports a small amount to Estonia. The term “Regional” will be used in this study to describe these five importers of Moldovan table grapes. According to the Food and Agriculture Organization these five countries have a population of 223 million and consume approximately 1.3 million tons of grapes per year, predominantly fresh.

Figure 1 below on the left shows the dominance of the Russian market, and growth of the Ukrainian market in the mid to late 2000s. The figure on the right shows the growing share of Moldovan exports to Russia while exports to Belarus, Ukraine and Romania remain the same. The spike of Moldovan exports to Romania, Belarus and Ukraine in 2005 – 2006 and the concurrent drop in exports to Russia was due to a Russian ban on Moldovan fresh produce during that timeframe.

Figure 1 Regional Import of Fresh Grapes from World (Left), Moldovan Table Grape Exports to Regional Market (Right)



Source: Based on UNCOMTRADE data, Author’s calculations

Moldova sells the major part of its grapes in the lower income market segments which are relatively less demanding in terms of quality requirements. Moldova’s main table grape market is Russia – importing 20 thousand tons or 75% of all Moldovan fresh grapes exports (Fig. 3, Right). Belarus accounts for 4.6 thousand tons or 17%, followed by Ukraine and Romania – 1.5 and 0.4 thousand tons respectively.

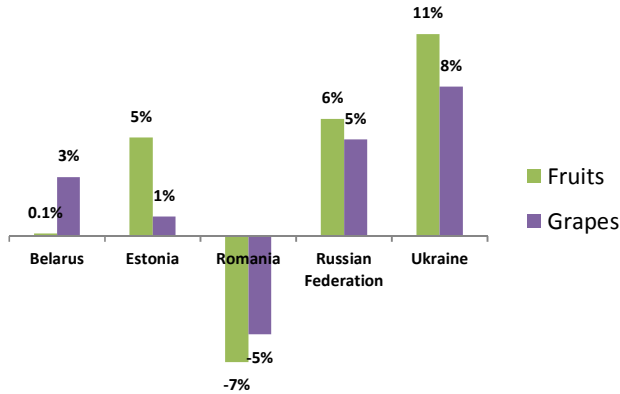
1.1.1 Regional Table Grape Imports

According to FAOSTAT the total Regional import of all grapes is approximately 440 thousand tons. From 2005 to 2009 fresh fruit imports to the Region increased from 4.9 million tons to 6.5 million tons, and grape imports from 348 thousand tons to 440 thousand tons. The main source of growth has been the steady increase of imports into the Russian Federation: fruit - from 3.7 million tons in 2005 to 4.9 million tons in 2009 and grapes – from 290 thousand tons in 2005 to 375 thousand tons in 2009. In 2009, Russia accounted for 76% of the regional imports of total fruits and 85% of table grapes¹.

¹ Based on FAOSTAT data, <http://faostat.fao.org/>

Figure 2 below presents a comparative picture of the yearly rate of change in imports of fruits and grapes by country. The high growth rate of grape imports in CIS regional countries such as Russia and Ukraine indicates that these end markets are not yet saturated. In the growing regional market annual grape consumption is about 1/2 of the level in the developed countries.

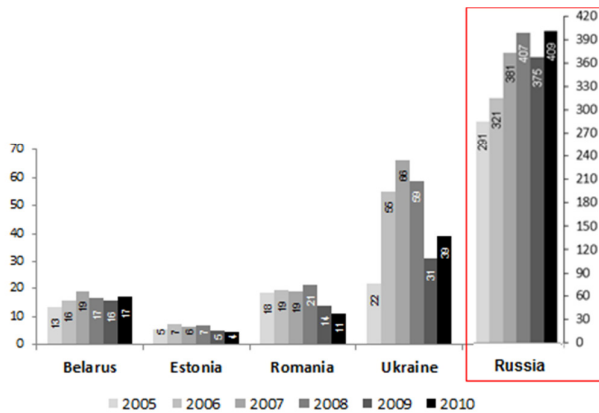
Figure 2 Yearly Rate of Increase/Decrease in Imports Quantity in the Period of 2005 - 2009, %



Source: Based on data from FAOSTAT

According to Figure 3 below, the key Moldovan table grapes market increased steadily before the crisis – though 2009. After one year of import decrease, Russia, Belarus, and Ukraine started to recover, but in Estonia and Romania the negative trend continued. Russia total imports of table grapes were 409 thousand tons in 2010 (85% of Moldova’s regional market). Ukraine was the second big importer with 39 thousand tons and 8% of the total Regional market imports from the world. Next is Belarus with 17.2 thousand tons - 3.5%, Romania 11 thousand tons – 2% and Estonia 4.3 thousand tons - 1.5%.

Figure 3 Evolution of Fresh Grapes Imports in Key Moldovan Markets, 2005-2010, Thousand Tons



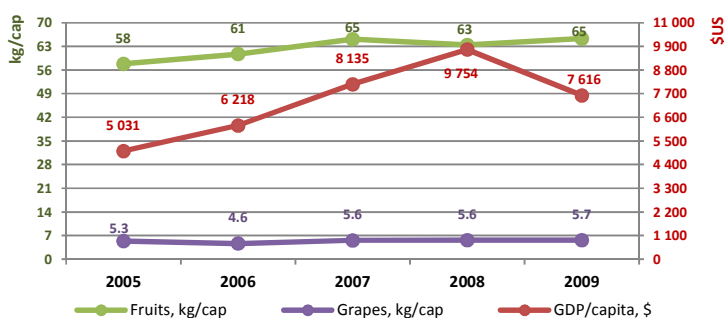
Source: UNCOMTRADE data, Author's calculations

1.1.2 Regional Table Grape Consumption

The increase in imports and consumption of fresh, high value produce in key growing markets are driven by the increase in incomes. The yearly rate of increase in GDP per capita was 8.6% per year from 2005 to 2009 as an average in the countries importing table grapes from Moldova. As a result, consumption and imports are growing despite the fact that during these 5 years the Regional population decreased by approximately 2.4 million people.

As shown in Figure 4 below during the period of 2005 through 2009 the average per capita consumption in key markets increased from 5.3 to 5.7 kg/person. For the same period regional fruit consumption per capita increased from 58 kg to 65 kg. Grapes consumption increased at an average yearly rate of 1.2% while total fruits increased by 2.5% per year.

Figure 4 Evolution of Regional Fruits and Grapes Consumption Per Capita Compared To Incomes Per Capita in Moldova's Key Markets*



Source: FAOSTAT, World Bank, Romanian Ministry of Agriculture

*- Key Markets means the 5 importers of Moldovan table grapes: Russia, Ukraine, Romania, Belarus and Estonia

Despite the overall increase in consumption, the marketing and sales of lower quality grapes in the Region is shrinking year on year due to strong table grapes competition from Turkey, Uzbekistan, Chile and Italy. Our analysis indicates that there are only a few years remaining when the Regional market will accept poorer quality produce. As a result, it is imperative that proactive measures should be taken by Moldovan producers in order to maintain at least present market shares.

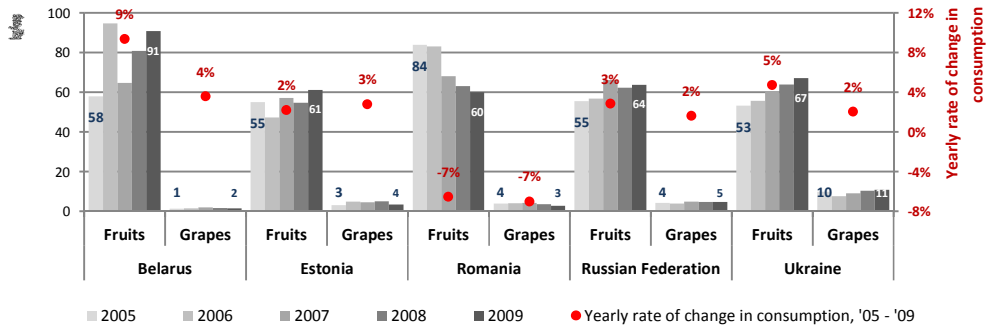
Figure 5 below compares the evolution of consumption per capita and annual rate of increase/decrease in consumption per capita for each of the Moldovan table grape importer countries.² The highest rate of growth in table grapes consumption was 4% in Belarus.

The Russian and Ukrainian grape consumption rate increased 2% per year.³ There is a greater increase in consumption of fruit compared to grapes in each country, except Estonia. Only in Estonia grapes consumption increased faster (3%) than all fruits (2%).

² FAOSTAT refers to both table and technical grapes

³ Based on FAOSTAT data, <http://faostat.fao.org/>

Figure 5 Dynamics of Consumption Per Capita in Fruits and Grapes in Moldova's Key Markets, 2004 – 2008



Source: Based on FAOSTAT data and Romanian Ministry of Agriculture

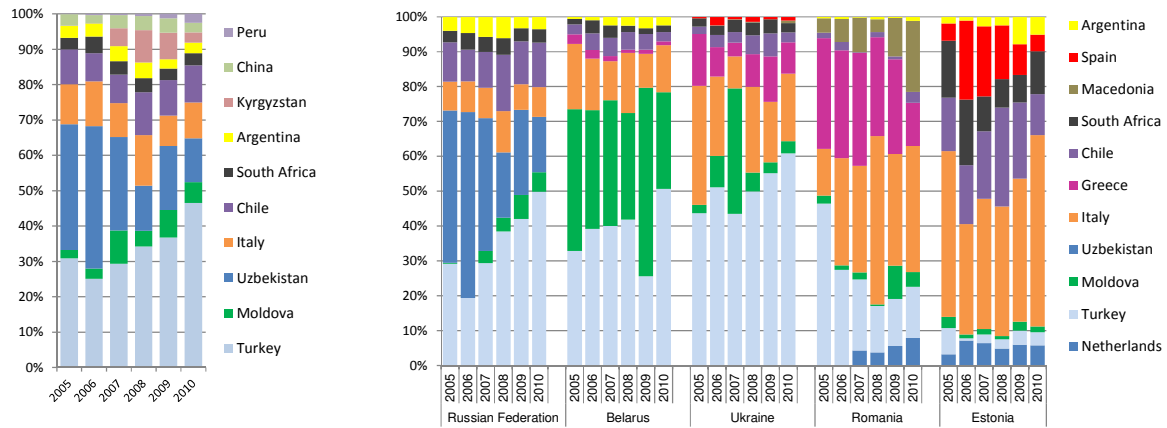
1.1.3 Competitive Position in the Region

The main countries competing against Moldova in the 480 thousand ton (2010) Regional table grape market are Turkey with 202 thousand tons – a 42% share, Uzbekistan – 54 thousand tons or 11%, Chile – 45 thousand tons or 9.5% and Italy – with 54 thousand tons or 8.8%. Moldova's share in regional table grape market is – 5.3%, 27 thousand tons⁴.

Figure 6 below shows market shares and the dynamics of the top ten table grape suppliers to the Region compared to Moldova's market share. It demonstrates that Moldova is gaining market share in Russia's growing market, has been maintaining a large share of the Belarus market, and is making limited gains in Ukraine, Romania, and Estonia.

Moldovan grapes appear to fare poorly in Ukraine though those figures are understated due to the large volume of grapes imported into Ukraine from Moldova illegally.

Figure 6 Lead Suppliers of Fresh Grapes to Regional Market (Left), and To Particular Markets (Right), Market Shares %



Source: UNCOMTRADE

⁴ Based on UNCOMTRADE data, 2010

1.1.4 Sale seasons

The best season for selling table grapes in the Regional market is November to December. From December to March the export price is more or less the same. However, in late November, December, and first half of January, large volumes are consumed and sold (demand is high). After that, the price is the same but the volumes sold decrease⁵. With better cold storage Moldova's season could be extended into March.

1.1.5 Table Grape Varieties

When considering the countries of origin by variety: most Thompson and Red Globe grapes come from Chile and Argentina, Kish Mish is delivered mostly from Turkey and Uzbekistan, and the Cardinal variety from the South African Republic and Latin America. During the months that Moldova is in the market all of Moldova's main competitors sell predominantly white grape varieties. Due to this higher supply, white varieties usually are cheaper than black or red ones.

As currently in the off-season there is only one major variety that is exported (Moldova variety), there are opportunities for additional little-known dark varieties which can attract consumers who are interested to try something new. These should be varieties, also harvested late in the season, that have the same good storability and heartiness as Moldova variety, but bigger berries and bigger bunches, as well as offer taste variety. Diversification should be limited to varieties that are profitable, and be planted in large enough areas to fulfill the condition of supplying one 20-ton truck in one day (e.g. plant not less than 3 ha of a new variety⁶). Dark variety diversification is mostly important for the off-season when Moldova does not have strong competition and the price is very attractive.

Aside from early, dark, and large bunch varieties (Red Globe, Cardinal and Codreanca (rebranded as "Black Magic" in Italy) that can be more profitable in the high season, late Moldovan varieties such as Osyennii Chyornii, Pamyati Zhuravelya and Pamyati Negrulya can quickly increase sales in the off season (late varieties that store and transport well).

1.1.6 Price

Branding by country of origin does not directly influence price (for example, consumers are not looking for grapes from a certain country).

However, grapes from Chile and Argentina command a higher price due to their higher quality (more uniform, bigger bunches, longer shelf life, firmer grapes, and handler friendly packaging). This higher price covers their increased costs of transportation, tariffs, etc. to travel three weeks by boat. Italian grapes also have higher quality and therefore command a higher price.

Table grapes from Italy and South America generally cost 10- 50% more than the average Moldovan table grapes of the same color. The high cost of Italian (also Greek and less so Spanish) table grapes creates a competitive space for lower quality Moldovan produce, as Moldova harvest timing (Sept/October) places producers in direct competition with other European growers.

1.1.7 Specific Quality Requirements

Legal requirements regarding table grapes quality are regulated by GOST 25896-83 standard for Russia, Ukraine and Belarus and EU Marketing standards for table grapes in Romania and Estonia. EU Marketing standards are generally more rigorous than GOST standards and a growing number of

⁵ "End Market Study For Fresh and Dried Fruits in Romania", USAID/ACED, October 2011

⁶ If there are 7 tons produced per hectare in average, then 3 ha should produce the required 20 tons to fill a truck.

importers from former Soviet countries have begun to informally apply EU standards, particularly in supermarket chains.

According to EU Marketing standards (Regulation 543/2011/EU) the following table grape requirements are in force in the EU market. There are three classes of quality, namely Extra Class, Class I and Class II.

Table grapes corresponding to minimum EU requirements should be clean, without any visible foreign matter, free from damage and pests, free of abnormal external moisture, whole, well-formed and normally developed. Pigmentation due to sun exposure is not considered a defect.

Table grapes of Extra Class must be of superior quality. Berries must be firm, firmly attached, evenly spaced along the stalk and covered with bloom (the natural film on the berry that disappears if handled and betrays that the bunch was handled). The grapes must be free of defects with the exception of very slight superficial defects, provided these do not affect the general appearance. They must have high quality preservation, packaging and presentation. For the 'Extra' class, bunches must be approximately homogeneous in terms of size and color.

Grapes of first and second quality classes allow certain tolerance to defects in shape, coloring, skin, sunburn, and slight traces of bruising. Each package must be uniform and contain only bunches of the same origin, variety, quality and degree of ripeness.

EU Maturity requirements

- 12⁰ Brix (sugar content) for Alphonse Lavallee, Cardinal and Victoria varieties,
- 13⁰ Brix for all other seeded varieties,
- 14⁰ Brix for all seedless varieties⁷.

EU Sizing Requirements

According to EU regulations, the minimum bunch weight is 75 grams⁸. "This provision does not apply to packages intended for single servings", which are now covered by a different EU standard. However, in reality the market players' requirements for this parameter are much higher. Supermarkets prefer bunches of 600-800 gr, with a minimum of around 400-450 grams.

EU Marking Requirements

A box can hold a mixture of grapes of different varieties, provided they have a homogeneous quality and, for each variety, the same origin. The visible part of the contents of the package must be representative of the entire box content.

Table grapes must be packed so as to ensure adequate protection of products. The materials used for packaging must be clean and high quality so as to avoid causing any external or internal damage to the fruit. Use of materials, particularly paper or stamps bearing trade specifications is allowed provided the printing or labeling has been done with non-toxic ink or glue. Stickers individually affixed on products shall be removable without leaving visible traces of glue and without causing skin defects.⁹

⁷ Regulation 543/2011/EU, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:157:FULL:EN:PDF>

⁸ ibid

⁹ ibid

1.1.8 Packaging

In the Regional market Moldovan products are visually unattractive when compared to products from other countries. This poor appearance limits their value in export markets, as well as in Moldova. Appropriate packaging would improve aesthetics, minimize transportation losses, and improve shelf life.

The best packaging in the cold season would be a 4.5-5 kg wooden box with protective paper layers. Wood will protect the grapes from the elements and the smaller format of packaging is more convenient for retailers when the volumes of sales are not very high. As an alternative during this season, it is possible to use the packaging generally adopted by South American suppliers, closed carton boxes with the grapes enclosed in plastic bags as shown in picture below. This would protect grapes from radical temperature fluctuations. However, due to the shorter logistics (in Moldova only field to cold storage to market), this more costly option is less of a necessity than for grapes coming from Latin America that get handled at many different temperatures and locations.

Photo 1 Fresh Grapes Enclosed in Plastic Bags from Egypt, Produced by Dakahlia Agricultural Development Co.



Source: Photo made at GLOBUS Distribution Centre in Moscow during End Market Study to Russia, August 2011

1.1.9. Regional Tariff Barriers

Moldova is member of the following International Trade Agreements:

1. World Trade Organization (WTO)
2. Autonomous Trade Preferences with European Union (ATP)
3. 17 Free Trade Agreements with:
 - Members of CEFTA (7 countries of SE Europe)
 - Members of CIS (9 countries) + Georgia

Regional tariff policy in foreign trade favors Moldova. In 2008 Moldova was granted Autonomous Trade Preferences with the European Union, and therefore fresh produce is not subject to trade tariffs for EU member countries including Moldova's neighbor Romania.

Being part of the Commonwealth of Independent States (CIS) Free Trade Agreement, Moldova does not have tariff barriers for exporting fresh produce to CIS countries. Conversely, in 2010 CIS table grapes importing countries have imposed trade tariffs for such competitor countries as Turkey, Chile, and Italy. A comparison can be seen in the Table 2 below.

Table 1 Regional Tariffs for Import of Table Grapes, 2010

Importer \ Exporter	Turkey	Uzbekistan	Chile	Italy	Moldova
Russia	3.75%	0%	3.75%	5%	0%
Belarus	3.75%	0%	3.75%	5%	0%
Romania	0%	14%	0%	0%	0%
Estonia	0%	14%	0%	0%	0%
Ukraine	10%	0%	10%	10%	0%

Source: International Trade Center, Market Access Map

1.2 Description of Key Markets

1.2.1 Russia

Retail Market

Russia has a population of 142 million. From 2000 to 2010 its GDP doubled. Russia contains 73 cities with populations over 250,000. Most of these are served by regional supermarket chains, some of which have over 100 outlets and most of which are expanding briskly in response to growing demand. Commercial sales to modern retail formats (such as supermarkets and hypermarkets) in Russia now account for more than 50% of overall fruit sales in larger Russian cities. Western style food retailing is increasingly well-developed across Russia. In Moscow and (particularly) St Petersburg, it is now dominant. Elsewhere, to varying degrees, independent stores, local traders¹⁰ and street markets remain dominant, but with steadily reducing market shares. This is driving the move towards higher standards in produce quality and proper product presentation.¹¹

The major supermarket chains are moving into new regions of Russia and taking over or eliminating the weaker independent chains. As it is shown in the map below the main cities and regions in Russia in which 50% of retail sales are performed in Supermarkets are: Moscow, St Petersburg, Krasnodar Territory, Rostov Province, Samara Province, Republic of Tatarstan, Republic of Bashkortostan, Chelyabinsk Province, Sverdlovsk Province and Tyumen Province.

A producer willing to work directly with a Russian or other regional distributor (for example, one connected to super market chains) on a long-term basis should be ready to accept payment 14-30 days after delivery. The biggest deals are made when producer and distributor work closely together and the distributor is paid on a fixed commission per box (e.g. \$1 per box). A usual scheme for the biggest deals is where the distributor has the flexibility to sell at market price (either at a loss or a profit) and then in the next month settle up with the supplier so that the distributor gets his pre-agreed fixed fee per box, and the supplier either compensates the price loss or is given the additional margin based on the market price at the time of sale. Currently it is not usual for Moldovan exporters to work in this way (requires big volumes of uniform quality, and trust between the distributor and supplier that the distributor isn't dumping produce below market price), but large competitors do so and as a result move large volumes much more quickly.

¹⁰ In this study we use the word "traders" to delineate the local business people that buy fruits from producers, store it and deliver it further to exporters.

¹¹ "End Market Study For Fresh and Dried Fruits in Russia", USAID/ACED, September 2011

Figure 7 Russia's Federal Administrative Subjects Generating 50% of Russian Retail Trade Turnover, 2011



Source: www.pmrpublications.com with reference to RBC Daily 2011

Open Wholesale Market

Russia's large open wholesale truck market where most Moldovan produce is exported, Pokrovka, accepts lower quality fruit and grapes than the supermarkets. However, as consumers get used to supermarket retail standards they demand higher and higher quality. As a result, there will likely be a decreasing demand in the coming years for the lower quality grapes even in markets like Pokrovka, as the volumes flowing through that market decrease and the market share of supermarkets continues to grow and as consumer preferences change.

Consumer Perception

According to the ACED end market study in Russia, consumer perception of Moldovan products is positive. Moldova is strongly perceived by Russians as producing natural agricultural products with good flavor and high quality resulting from favorable climate conditions. Presumably this positive perception extends to Belarus and Ukraine who also import Moldovan grapes and share an intertwined history. Russian shoppers believe that agricultural products grown in Moldova are more natural and flavorful than products grown elsewhere in the world. The negative comments expressed by consumers were in regard to unattractive appearance and packaging.

Table Grape Varieties

White varieties flood Russian market starting with July each year. White grapes are present in large quantities until December as seen in the Table 1 below.

The table below shows exports to Russia from various countries by volumes for both white and dark varieties. Different varieties of table grapes are present in the Russian market throughout the year. Argentina, Chile, Turkey, Italy, and South Africa are the most frequent suppliers of table grapes to the Russian marketplace. The table indicates that Moldova's main competition for the supply of dark varieties is increasingly coming from China. However, China sells mainly to big Eastern Russian cities such as Khabarovsk and Vladivostok and therefore is not currently offering direct competition.¹²

¹² "Russian Market for Table Grapes" study, Magenta Consulting, November 2008, Chisinau

Table 2 Seasonal Export Volumes to Russia, in tons, 2009

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	2 770	3 694	2 414	680	154	0	0	0	0	0	0	0	9 713
South Africa	1 781	2 075	2 049	2 602	1 782	96	6	0	0	0	2	707	11 099
Chile	201	2 410	9 497	15 085	5 567	3 866	130	0	9	0	0	1	36 767
Egypt	0	0	0	0	0	2 264	2 647	46	0	0	0	0	4 958
Uzbekistan	20	0	0	0	0	19	1 522	1 681	16 843	35 683	16 331	183	72 283
Kazakhstan	21	0	0	0	0	16	848	9 645	9 208	7 051	2 303	743	29 835
Italy	65	7	2	0	0	369	2 038	3 251	3 325	5 522	4 524	2 662	21 766
Turkey	2 812	395	0	0	0	308	5 851	27 548	38 238	27 622	14 482	8 102	125 357
China	99	59	30	14	12	254	618	1 054	3 419	5 437	3 400	1 700	16 095
Moldova	823	1 055	694	37	0	0	0	1 588	2 757	6 212	5 548	1 836	20 549
Total	8 589	9 695	14 687	18 418	7 515	7 193	13 661	44 814	73 800	87 527	46 591	15 933	348 423

- White varieties
 - Dark varieties

More intense color means bigger volumes

Source: Based on rough data from Russian Federation Customs Department Database

The main variety that is exported is “Moldova”: comprising approximately 80% of exports. This is due to it having a robust shelf life, making it comparatively easy to store and transport. Moldova starts supplying table grapes for export in August. Usually these are both white and dark varieties. Dark varieties sell better. Producers begin to put grapes in cold storage only when the dominant amounts of Moldova variety are harvested the third and fourth weeks of September. Table grapes are delivered by exporters to the market directly from the field. When all of the Moldova variety has ripened, traders and producers prepare their cold storages to store it and then be able to sell it in the off season: from December to March.

Although there are competitor countries supplying dark varieties to the Russian market, significant quantities come after Moldova’s supply has finished (in March). As a result, dark Moldovan varieties do not face direct aggressive competition. A negative aspect of this is that it leads to a relative unwillingness of traders and producers to raise their standards, as will be necessary in coming years.

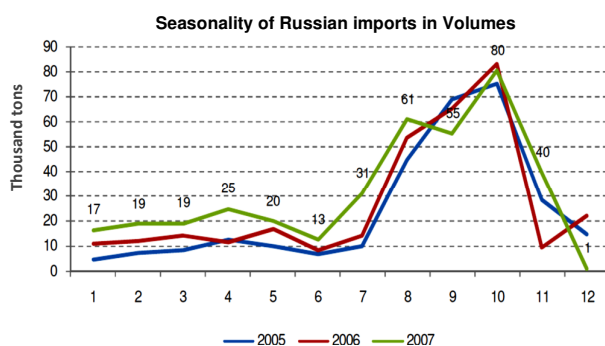
Grapes from Turkey and Uzbekistan capture the main share of the Russian market. These countries supply mainly white varieties which are 20% – 30% cheaper than dark ones and, in addition, are good quality. Higher priced and less supplied dark table grape varieties are the segment where Moldova can maximize profits.

Prices

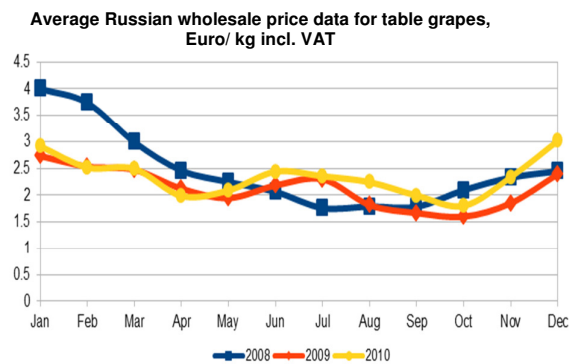
In the Russian market, table grapes of Extra Class quality cost between 20-60% more than grapes of second class characteristics. The year 2011 has provided difficulties for Moldovan table grape producers resulting in white Moldovan grapes garnering low prices in 2011. A large volume of white grapes remain to be sold on the local market causing an oversupply and diminishing substantially the prices. One reason for the low prices in 2011 is the Belarus Ruble depreciation which made that market channel suddenly unprofitable mainly for white varieties that are lower priced. Second, Ukrainian borders began to implement a tighter control in 2011, whereas previously a lot of white grapes were unofficially exported for sale in Ukraine (with unofficial payments but not official duties nor contract with an importer). As a consequence a lot of small traders could not export grapes in 2011, diminishing the demand and respectively prices.

As demonstrated in the chart below on the right, the best prices are offered regionally in the off season between November and March. The average price during this period for Moldovan grapes in the Russian wholesale market is \$US 2.80. The price begins to fall in March when Chilean grapes appear in large volumes.

Figure 8 Wholesale Prices and Seasonality on the Russian Market¹³



Months 1-12 (Jan- Dec)
Source: Russian Federation Customs Department



Source: APK Fruit-Inform

Quality Standards, Sanitary and Phytosanitary Requirements

Moldovan table grape producers are expected to meet the same quality standards as any other supplier for the given market segment. Most buyers accept only fruits of high and first quality. Table grapes of “second class quality” can be sold in small traditional retail stores, open markets and in discount stores, like Piatiorotchka or Kopeika.

In order to ship produce to Russia (and, starting in August 2011, also to Belarus), the exporter should be included in the list of exporters approved by Federal Service for Veterinary and Phytosanitary Control of Russia. The scheme of import and payment is sophisticated and requires utilization of the indicative import price imposed by the Customs Office in Russia as well as a long chain of tax avoidance mechanisms. Exporters that do not comply with these formal and informal “rules of the game” simply cannot deliver produce to Russia competitively.

Periodically, Moldovan trucks are turned back at the border upon inspection. At the border, Grapes are tested for compliance with sanitary and phyto-sanitary standards. When multiple batches are transported in one truck, they can be registered with the same quality certificate and the same certificate indicating the toxin level and requirements regarding pesticides. However, this paperwork should provide data regarding every batch included. This paperwork originates with the Phyto-sanitary inspectorate in Balti and Chisinau. At the border, the Russian brokerage companies take care of filling in all necessary import documents including obtaining the Russian phytosanitary and quality certificates. Only very occasionally do customs officials do an in-depth check and testing of produce. Usually a small sample is provided and visually inspected.

When sold to supermarkets, approximately 15% are randomly checked by lots (a several ton grouping).

Sizing Requirements

In the Russian market there are three main grading requirements. First, sizing is extremely important. The weight of the bunch should be minimum 400-450 grams and quality grapes 600-800 grams with “the bigger the better” being the general rule, along with size uniformity of the berries. Second, it is important that the grapes be free of visual defects. The third is color. Usually consumers do not distinguish varieties by names as they don’t know the names of different varieties. Many Russian importers classify varieties into simple color categories of black, red, and white (green) table grapes.

¹³ “End Market Study For Fresh and Dried Fruits in Russia”, USAID/ACED, September 2011

Packaging

There are no specific packaging requirements for fruit in the Russian market as long as it is sufficiently protected from being damaged. If the packaging satisfies this requirement then it will be accepted by the buyer.

Several types of packaging from wood, carton or plastic are accepted in Russia and all of them are available in Moldova. Most table grapes are delivered to the Russian marketplace in wooden or cardboard boxes, with the capacity of 4.5 or 8.5 kg.

The following dimensions of boxes are most common: 50cm x 30cm, 40cm x 60cm, and 40cm x 90cm. Boxes of veneer or plastic are less common, but are growing in popularity due to their strength. Inside any package, it is important to Russian importers that bunches are arranged in one level, and not stacked on top of each other. At the distribution centers such as Globus and Victoria in Russia grapes are packed for supermarkets, usually each bunch comes in a separate crate covered with stretch film.

Photo 2 Codreanca (Black Magic) Grape Bunch Enclosed in Individual Packaging, Produced in Italy



Source: Photo made at GLOBUS Distribution Centre in Moscow during End Market Study to Russia, August 2011

1.2.2 Belarus

The population of the Republic of Belarus is 9.7 million, mostly urban, living in cities uniformly spread throughout the country's territory. Over 50% of Belarusians live in cities with populations over 50 thousand, while 17% live in smaller towns. In the last ten years the volume of table grapes imported by Belarus increased five-fold, reaching over 19 thousand tons in 2007. In 2008, under pressure from the world economic crisis, imports fell by 13% to 17 thousand tons. In 2009 and 2010 Belarus imports were 16 and 17 thousand tons respectively.

Prices

Due to increasing average import prices, the value of imports has grown ten-fold, from \$1 million in 1999 to \$18.6 million in 2008. The highest prices were commanded by suppliers from the Southern Hemisphere (\$2200/ton) and Italy (\$1800/ton). Turkey is positioned in the middle segment (\$1100/ton), while the cheapest market segment is dominated by Moldova (approximately \$500/ton).

While it has been a steady importer of Moldovan table grapes, economic problems in Belarus in 2011 could have a major impact on Moldovan table grape exports, supply and price, and could translate into an oversupply and reduced price in neighboring markets.

Table Grape Varieties

In the Belarusian market both white and dark table grapes are popular. Unlike in other regional markets, it is more reasonable to export white varieties to Belarus due to higher transport cost incurred by Turkish exporters. As a result, in the Belarus market, Moldova enters into direct competition with Turkey in the white varieties niche. For dark varieties Moldova does not face serious competition.

Packaging

The packaging used by Moldovan exporters does not fully meet the requirements of Belarusian importers or retailers (particularly supermarkets). Most Moldovan table grapes are packaged in wooden crates, while Belarusian importers prefer grapes packaged in a single layer in disposable cardboard boxes of 4-8 kg. Some supermarkets mentioned that they would prefer each bunch to be packaged separately in polyethylene or paper packaging before being placed in the cardboard box. In addition to quality and packaging, special attention must be paid to the supplied varieties.

Consumer perception

Given the rules of trade between Moldova and Belarus (FTA in the frame of CIS), the market's proximity, and Belarusian consumers' knowledge of Moldova coupled with the taste of Moldovan-produced fruit and vegetables, Belarus remains a market with potential for Moldovan produce. However, the quality of the produce, varieties and look must be improved, while Moldovan exporters must carefully identify markets for table grapes before finalizing production and export sales plans.¹⁴ Consumer preferences in Belarus are shifting from quantity to quality. Despite this, when Moldovan table grapes are mentioned, all respondents in the ADP 2009 market study said that everything depended upon price. Furthermore, old perceptions about low cost Moldovan produce still persist in Belarus.

Competitive Position in the Market

Turkey entered the Belorussian market in 2004 and soon became the main supplier of grapes (42% in 2008). Although exports from Moldova have grown in absolute terms, their performance has been below the average growth rate. Thus, Moldova's share has fallen from 57% in 1999 to 31% in 2008. Italy and Greece are two other major competitors to Moldovan grapes in the Belarus market. Grapes from the Southern Hemisphere (Chile, Argentina and South Africa) make up 10% of the market with deliveries between January and July, when deliveries from European countries are minimal.

1.2.3 Ukraine

The many changes that took place in the Ukrainian populace's lifestyle and economy in recent years have increased the demand for a wide range of fresh fruits and vegetables, including table grapes.

Production and Imports

Table grapes production in Ukraine is concentrated in the regions of Odessa, Nikolayev, Herson and Crimea. The average production volume over the last years has been 100 thousand tons.

In 2008 imports reached 59 thousand tons (40% of domestic Table Grape consumption) valued at USD 45 million. In 2008 an increase of import prices was recorded. Nevertheless, import prices are still significantly below the average price in the international market. Turkey is the main supplier, having a quota of 45%. It is followed by EU suppliers – Italy (22%) and Greece (10%). The largest

¹⁴ "The Belarus Market for Table Grapes", Target market confirmation study, USAID/ADP - March 2009, page 2

quantities are imported during the months of August-October, during the main suppliers' (Italy and Turkey) production season. During the months of January-June, Holland becomes the main supplier, not as a producer but as the lead logistical hub and re-exporter of table grapes from southern countries.

Moldovan table grapes exports to Ukraine have been facilitated by the import tax exemptions granted by the CIS Free Trade Agreement; while the other competitors (Turkey, Italy) are subject to taxes. However, over the last four years, these advantages were eroded by the reduction applied by Ukraine on import taxes.

Consumer Perception and Quality

Both Moldovan and Ukrainian table grapes are sold in the Ukrainian market, but judging by the data obtained from the respondents (based on the ADP survey performed in 2009), the table grapes from both these countries are positioned in the low price market segments. Although the Moldovan table grapes are considered tasty, they are poorly sorted and packaged, and as a consequence, large quantities of table grapes reach Ukraine in a poor condition, generating losses for the importers and the supermarkets.¹⁵

1.2.4 Romania

Romania is the second largest market in Central and Eastern Europe after Poland, with a relatively stable population of 21.5 million people. It was one of the fastest growing economies in Europe before 2008 (in the pre-economic crisis period).

Retail Market

The city of Bucharest has the largest retail market in Romania, totaling 45% of all retail sales in the country. Currently, the modern retail trade format (supermarkets, hypermarkets, discounters, etc.) represents 45% all national retail sales, with hypermarkets and discounters representing the fastest growing segment.

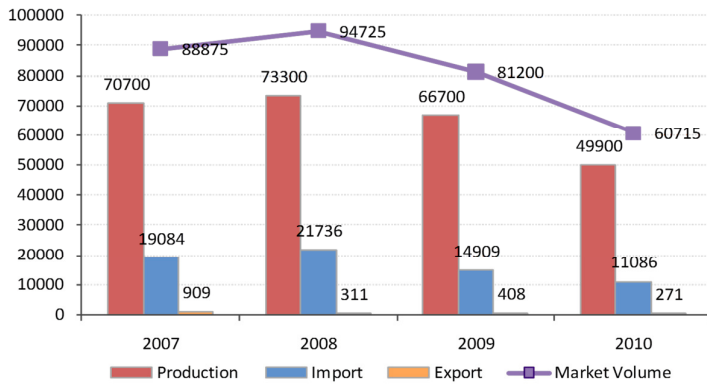
In Romania, which is a member of the EU since 2007 and complies with EU fresh produce market and quality regulations, it is more difficult for Moldovan table grapes exporters to enter. Despite its immediate proximity Moldovan growers and exporters know very little about the specifics of this market. Exporters were traditionally focused on bigger eastern markets that accept the relatively poorer quality standards maintained in the Moldovan table grape value chain. Thus, despite its linguistic and geographic proximity to Moldova, Romanian imports of table grapes are dominated by Italy, Turkey and Macedonia. However, as Macedonia is a non-EU country and its grapes are not of a very high quality it means that there is also potential for Moldovan table grapes.

Market Volume

As it is described more deeply in the Romania End Market Study performed by ACED, over the course of the last four years overall table grape consumption decreased in Romania by 7% per year. That was caused by an instant increase in exports of local Romanian produce to EU market in the year 2007 when Romania joined the EU, diminishing local consumption and after that a second cause was the financial crisis that emerged at the end of 2008. The crisis diminished production and imports in 2009. As a result, prices for fresh produce including for fruits and grapes soared, and as a consequence, consumption dropped. Despite this shrinking market, ACED end market study determined that there is better potential for Moldova to increase table grape exports to Romania than other Moldovan HVA produce.

¹⁵ "The Ukrainian Market for Table Grapes", Target market confirmation study, USAID/ADP - March 2009

Figure 9 Romania Market Volume of Table Grapes, Tons

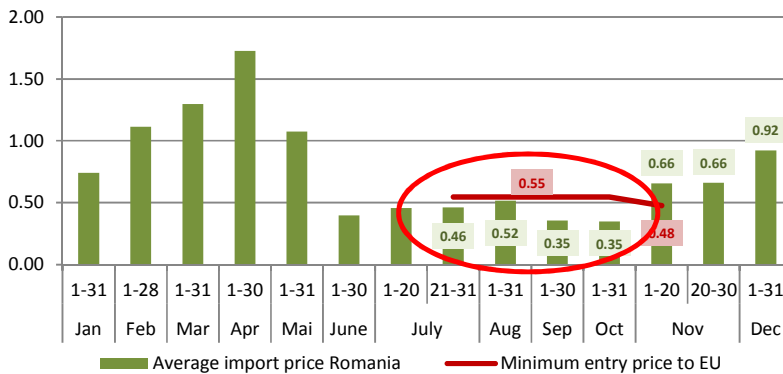


Source: EUROSTAT Data Base

Competitive Position in the Market

As in the case of other horticultural produce, Moldovan exports of table grapes to Romania are subject to the minimum import price system. As shown in Figure 10 below, the minimum EU entry price for Moldovan grapes during the high season (July 21-Nov 20) is higher than in the Romanian internal market. In the period of July 21 – October 31 the official minimum entry price is €0.55/kg (~\$0.74/kg) and from November 1st till November 20th it is €0.48/kg (~\$0.64/kg) while the price of intra-EU suppliers of fresh grapes to Romania like Greece and Italy is €0.42/kg (~\$0.60/kg) through November 20. In the off-season, after November 20th until July 21 there is no minimum entry price for fresh grapes in the EU market. Therefore, it is only in the off-season that Moldova has decent ability to compete in the Romanian market because if the exports are performed earlier an ad-valorem tax is charged at the border.

Figure 10 Monthly Import Price in 2010 and Minimum Entry Price Fluctuation for Table Grapes in Romania, Euro/Kg¹⁶



Source: Global Trade Atlas

During 2003 - 2008 period, Italy emerged as the main supplier of table grapes in the Romanian market, increasing its market share from 12% in 2003 to 44% in 2008. Greece has maintained its position (27%), while Turkey has reduced its presence from 49% in 2004 to just 13% in 2008.

The results of the ACED end market study show that the Romanian market for table grapes could become a significant one for Moldovan exporters, if the following retailers' requirements are met:

- The supply period must be extended (e.g. by improving storage facilities)

¹⁶ "End Market Study For Fresh and Dried Fruits in Romania", USAID/ACED, October 2011

- Packaging must be improved, while suggested sizes are 9 kg, 8 kg, 4.5 kg: also required are pre-packaged bags for retail sale (ventilated plastic bags) containing one bunch of table grapes weighing about 1 kg, packaged in cardboard boxes
- Moldova is Competitive on price with other European countries
- Shift to / implement EU Marketing Standards (previously known as quality standards)

Market Requirements

Some ACED EMS respondents expressed interest in working with Moldovan table grapes exporters, but one of the main issues that need to be addressed is reviewing the varieties of table grapes produced and offered by the exporters. All respondents mentioned the high demand for large grapes (e.g. X, XL sizes), large bunches and resistant and firm attachment of grapes to the bunches.

Based on the experience gained with other Moldovan produce, Romanian wholesalers recommend table grapes exporters to use good transport, equipped with refrigerated trailers to maintain the quality of grapes during transportation. During the interviews, all representatives of supermarkets and importers in Romania stressed the fact that table grapes must meet EU Marketing Standards (previously known as Quality Standards).¹⁷

1.2.5 Estonia

Similar to Romania, in the period of 2005-2008 Estonian market grew rapidly but after the financial crisis of 2008 it registered a significant decline. The per capita consumption trend repeated the import trend with 3 kg in 2005, reaching 5 kg in 2008 and falling to 4 kg in 2009 and to 3 kg in 2010. The main table grapes exporting countries to Estonia in 2010 by volume were Italy (46%), South Africa and Chile (10% each). The share of Moldova on the market was only 1.4%. On one hand, similar to Romania, the EU market standards are high. On the other, the small foothold in the Estonian market offers a platform to build upon as table grape quality will increase. The EU minimum entry prices also apply in Estonia as described in the Romania section above.

¹⁷ "The Romanian Market for Table Grapes", Target market confirmation study, March 2009

The value chain map presented above depicts the major trade channels and functions along the value chain. The major points of interest depicted in the map are discussed in further detail below.

2.1.1 Growers

In general table grape growers were categorized by ACED based on their potential ability to provide to the market a product that is uniform by volume, quality, and value. For a more precise categorization we developed a benchmark that shows if the grower has the potential to fulfill the export volume and uniformity requirement and how far is it from obtaining this ability.

The basic assumptions used as constants in calculating this benchmark are: i) One worker is harvesting 300 kg of grapes in one day; ii) The maximum number of seasonal workers a grower can attract in one day is 50 people; iii) The harvesting period for one discreet variety is 12 days. By combining these constants with the variables we obtained from the database¹⁸ like surface, volume and number of varieties, we can organize growers in separate groups having a distinct capacity to provide a volume of 20 tons- to fill one truck (Tr) load- per grower (G) per variety (V) per 8 hour day (D), i.e. $Tr/G/V/D$.

This benchmark represents:

- 1) a uniform volume that can be transported to and pre-cooled efficiently in a 20 tons forced air cooling chamber (standard volume of pre-cooling chambers is 20 tons);
- 2) a uniform quality that results from the fact that grapes of the same variety are collected in a short time in one place and transported to be cooled rapidly without delays of traveling to different plantations.¹⁹
- 3) a uniform value due to the fact that grapes do not differ in their quality as can happen when a truck circulates to collect grapes over a 2-3 day period from smaller farmers.

The main goal for using this benchmark is to identify which growers are most ready to access the highest quality markets (such as export to supermarkets). With a few upgrades and links to new buyers, those growers can more quickly act as a role model for other smaller farmers. The smaller farmers will need more upgrades and group marketing to surmount the issue of time required to get into cold storage, in order to achieve the necessary uniform quality and shelf life needed for higher value-added retail.

According to the categorization described above and based on the data collected during the Table Grape survey performed by USAID/Moldova Agribusiness Development Project in 2009, four categories of producers were identified. These groups were called Output Capacity Groups and the order of the group shows the extent to which growers of that group have the potential to provide a uniform output of grapes in terms of volume, quality, and value as shown in the table below.

The table below shows the four categories or Output Capacity Groups (OCGs) and their description in terms of number of growers, volumes, surfaces and yields. OCG 1 is represented by growers that have the potential to provide uniform volume and quality to the market and it is the only group currently capable to do so. The other three OCGs: 2, 3 and 4 have the capacity of providing less than one truck of the same variety per day.

¹⁸ Based on data collected during the USAID/ADP, "Moldova Table Grapes Production Appraisal", August 2009

¹⁹ Temperature is the most important determinant of the shelf life of fruit. If the harvesting/loading period lasts more than 1 day before grapes are put to cool then the quality is lost as stems brown due to humidity loss. Uncooled grapes can deteriorate more in 1 hour at 90°F (32°C) than in 1 day at 40°F (4°C) or in 1 week at 32°F (0°C). Source: "Technical Input for Improved Cold Store Operations in the Republic of Moldova", USAID/ACED, August 2011.

Table 3 Division of growers by Output Capacity Groups

Type of grower	Large growers		Medium	Small	Total
Output Capacity Group	OCG 1	OCG 2	OCG 3	OCG 4	
Volume of loading per day, 20 tons truck / grower / variety / day, T/G/V/D	>= 1	0.5 – 1.0	0.2 - 0.5	< 0.2	
Growers	10	27	76	1 949	2 062
Tons	3 745	9 333	15 497	25 172	53 747
Ha	559	1 393	2 313	3 757	8 022
Average tons/grower	375	346	204	13	26
Average ha/grower	56	52	30	2	4

Source: Calculations based on data collected during the USAID/ADP, "Moldova Table Grapes Production Appraisal", August 2009

As we see in the table, in the first OCG there are only 10 producers. They have the capacity to harvest and load one or more 20 ton trucks per day with one consistent variety. These 10 growers represent only 0.5% of the total producers. By production volume, these 10 large growers combined deliver 3,745 tons per season, which is 7% of total commercial table grapes production. Due to the fact that they have uniformity in volumes and in varieties, these growers will more easily be able to improve quality. These are the ones that can most quickly implement and apply new and improved growing technologies, post-harvest practices and partner with foreign supermarket chains. Growers from the other Output Capacity Groups have to have some sort of cooperative harvesting, loading, and marketing program to reach the same capacity as OCG1.

The major part of growers in OCG 1 and OCG 2 can be categorized as Large growers with surfaces ranging from 18 to over 140 ha (OCG 1: is on average 56 ha/grower, minimum 34, maximum 140 ha, OCG 2: is on average 52 ha/grower, minimum 18 – maximum 126 ha). As can be seen in the table grape value chain map, the growers from OCG 1 own their own cold stores and some (the major) growers from OCG 2 have cold stores.

OCG 2 has the output capacity of half a truck (10 tons) per grower per variety per day. They might be large farms that have diversified the varieties so that they cannot fill a truck in the same day with the same variety. These growers typically organize harvesting by themselves. Usually traders provide their own packaging for the produce. Only rarely do growers use their own packaging and it's in cases when they put the grapes into storage to be sold in the off-season, as would only be the case with large growers of dark varieties. Usually in this group, growers sell their products during the off-season from cold storage that they either own or lease.

OCG 3 capacity is to provide 0.2 – 0.5 of a truck per day. OCG 3 represents medium size growers that farm an average area of 30 ha/grower varying from 8 – 110 ha.

OCG 4 predominantly represents the 1,940 small growers that have an average surface area of 2 ha varying from 0.5 –44 ha. OCG 4 growers usually have poorer knowledge of growing technology, harvesting and postharvest techniques and don't utilize integrated pest management. These growers do not properly apply fungicide and pesticides, in the right time frames. Furthermore, these small farmers might ignore, or not even know that for food safety no chemicals should be applied in the 30 days leading up to harvest. This group sells mostly to the domestic market.

Gender

According to the information offered by MAGPE there are 11 women leaders involved in table grape production that are members of the Association. However none of them are members of the MAGPE Council. This is due to the fact that at the date of MAGPE creation (2008) there were only men and no women among the association members. However, the MAGPE director has informed ACED that he

is planning to raise the issue of including women in the Council at the next meeting to be held December 14, 2011.

MAGPE estimates that 5% (100 women) of the total number of table grape producing companies is headed by women. MAGPE is in the process of creating smaller associations in the Districts of Moldova and reports that there is a woman leader of an association in Straseni District.

Women employees are hired more frequently to perform such activities as harvesting and sorting post cold storage. Due to the fact that some growers keeping table grapes in cold stores incur problems with produce spoiling, rotten berries need to be cleaned out of the bunches before shipment. This process occurs only in the off-season in December-January. As grapes need to be kept at a temperature of -1 to 0°C women doing sorting are exposed to cold. ACED will provide training to table grape growers in the field of good Post-harvest Handling practices, which will have the effect of minimizing grapes rotting. This will improve table grapes quality and will enable cold stores to redirect women labor to activities with better working conditions.

As wholesale traders or exporters, women are not well represented in leading positions. However, women are often present as employees in non-leading positions of trading companies in local markets.

In order to ensure equal access and participation of women into its activities, ACED will consider gender integration when organizing table grapes workshops, table grapes forums, trainings, study tours, demo events. ACED will identify and invite both men and women table grape producers in target groups; for demo-plots; when providing access to each kind of information and informational tools: guides, training materials, MIS, etc.; and when providing input supplier, finance market, and linkage assistance.

Level of growers' specialization

Growers' specialization in table grapes production is very important as it leads to better focus, higher investments, higher productivity and better quality. The level of concentration in Moldovan table grapes production varies from one type of grower to another as well as from one Output Capacity Group to another. Usually the table grape growers that are large grow different crops including fruits and field crops. Smaller growers also have several crops focusing on a few fruits and table grapes. Only a few large growers use their land for growing only table grapes concentrating production close to 100% as presented in the Table 7 below. The average table grapes concentration level among all producers is 62% (the total surface of table grapes out of the total surface farmed including other crops). The highest level of concentration is in OCG 4 – 63% and OCG 3 – 46%. The lowest specialization rate is in OCG 2 – 28%. This is explained by the fact that there are a lot of very small growers that have small plots on which they have only table grapes (common in the south). The smaller growers in OCG 4 which have a higher rate of table grape concentration can consolidate into producer and marketing groups in order to take advantage of their focus on table grapes.

Table 4 Growers Average Level of Table Grape Production Concentration

Types of growers	Output Capacity Groups	Total surface farmed by TG growers, ha	TG surface, ha	Total nr. of growers	Specialization rate (share of TG surface in total farm surface)	Total number of growers with a concentration higher or equal to:		Share in total number of growers with a concentration higher or equal to:	
						>=50%	=100%	>=50%	=100%
Large	OCG 1	6 811	559	10	43%	4	3	40%	30%
	OCG 2	23 507	1 393	27	28%	5	3	19%	11%
Medium	OCG 3	29 625	2 313	76	46%	34	24	45%	32%
Small	OCG 4	24 845	3 757	1949	63%	1127	802	58%	41%
Total		84 788	8 022	2062	62%	1170	832	57%	40%

Source: Product of present research

The lack of specialization also leads to the inability of the farmers to attract labor. This inability manifests through such aspects as: i) low daily payment, ii) lack of transport means to collect people from other villages. In addition to these two, potential workers have their own gardens and during late variety harvest they are busy harvesting their corn for animal feed.

2.1.2 Production

According to data from the Ministry of Agriculture and Food Industry the total surface of table grapes plantations in 2009 was 14.6 thousand ha, including a fruit bearing area of 13.4 thousand hectares. The total production volume was 70 thousand tons with an average yield of 5.2 tons/ha.

Based on a triangulation of official data and information gained from key stakeholder interviews, the project estimates a total volume of production of fresh grapes in Moldova of slightly over 50 thousand tons per year. According to the Table Grape survey performed by USAID/ Moldova's Agribusiness Development Project in 2009 the total area of table grapes plantation in Moldova was estimated at approximately 8 thousand hectares, which yields on average 6.7 tons/ha. The present analysis is based on the survey data due to the fact that it provides a deeper disaggregation (by type of grower, varieties and surfaces per grower).

Table 5 Short Description of Moldovan Table Grapes Sector, 2009

Indicators	Value
Total surface planted with TG, ha	8,022
Total production, tons	53,747
Average yield, t/ha	6.7
Total number of growers	2,062
Average number of workers at harvest, worker/grower/variety/day	4
Average surface planted by growers per each variety, ha	2

Source: Based on data collected during the USAID/ADP, "Moldova Table Grapes Production Appraisal," August 2009, Authors' Calculations

According to our analysis, the average yield of table grapes in Moldova is 6.7 tons/ha. Depending on the vine variety, density of plantation and pruning scheme, harvest could yield between 5 and 20 tons of grapes per ha.²⁰ In countries and cases where the latest technology is employed and climate is close to ideal such as in Argentina, Chile, Italy, South Africa and Turkey, the yields can reach 20 tons per hectare. However the average yields in such representative table grape producing countries is lower than 20 t/ha as is demonstrated in the table below. All the same, each country has a higher yield than in Moldova, with Italy almost twice as high and Argentina, Chile and South Africa more than two times as high.

Table 6 Dynamics of the Average Yields in Main Table Grape Producing Countries, Tons/ha

Country	2005	2006	2007	2008	2009
Argentina	13	13	13	13	10
Chile	13	13	13	12	13
Italy	11	11	9	10	10
South Africa	15	16	16	14	13
Turkey	7	8	7	8	9

Source: <http://faostat.fao.org/site/567/default.aspx#ancor>

There are approximately twenty one hundred commercial table grape growers in Moldova. As per the Moldovan Ministry of Agriculture and Food Industry commercial growers are those who work on more

²⁰ FAO/EBRD Agribusiness Handbook "Grapes Wine"

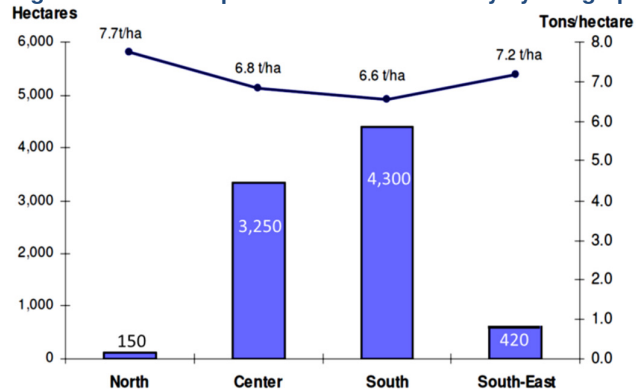
than 0.5 ha. An area bigger than this requires hiring external labor force and the intention to make a business out of this work once these costs are incurred.

The vast majority (95% of the total number of commercial growers) are small growers that hold 47% of the area under production. When the land reform was carried out, very small plots emerged. For example, 300 ha vineyards were split into 300 parcels (number of parcels depending on the number of families in the village). Due to this, the average Table Grapes parcel size among small growers is very small: about 2 ha/ grower. The rest of commercial growers (5%) are producers that hold 53% of the fresh grape production area.

Growers producing table grapes on less than 0.5 ha are considered to grow grapes for domestic use. Generally, they were not table grapes farmers and pay attention to harvesting grapes for wine and providing minimal up-keep only during the season. To harvest less than 0.5 ha of grapes takes no more than 5 people, which can be done with family resources. The predominant variety for these growers is “Moldova,” which can either be consumed fresh or made into wine.

With regard to the geographical distribution of the table grape vineyards, the biggest share – 4,300 hectares – is in the South, followed by the Central zone with 3,250 hectares and the South-East (Causeni and Stefan Voda raions) with about 420 hectares. In the Northern zone table grape are commercially grown only in Falesti, Floresti, Glodeni and Drochia raions, with a total area of about 150 hectares. Meanwhile, producers from the Northern zone report the highest per hectare productivity – about 7,7 t/ha on average. The smallest productivity – about 6,6 t/ha is reported by producers from the South. As 96% of table grapes surfaces are rain-fed the differences in productivity come mainly from the amount of precipitation falling in these regions in a given production season.

Figure 11 Table Grape Areas and Productivity by Geographical Zones



Source: “Moldova Table Grapes Production Appraisal”, August 2009

Production technologies

The existing table grape production technologies in Moldova are traditional, insufficiently specialized, and similar to those applied for wine varieties. The dominant trellis system for vine formation is a vertical espalier²¹. The usual plantation scheme is 2.75-3 meters by 1.5-1.75 meters. Canes are commonly buried during the fall-winter seasons, in order to protect the canes and roots against extreme frost. However, growers cannot protect against late spring frosts, which occur quite often in Moldova and affects very young shoots.

The disease and pest control system is based largely on application of chemicals, while the utilization of biological crop protection is insignificant. Insufficient attention is paid to soil,

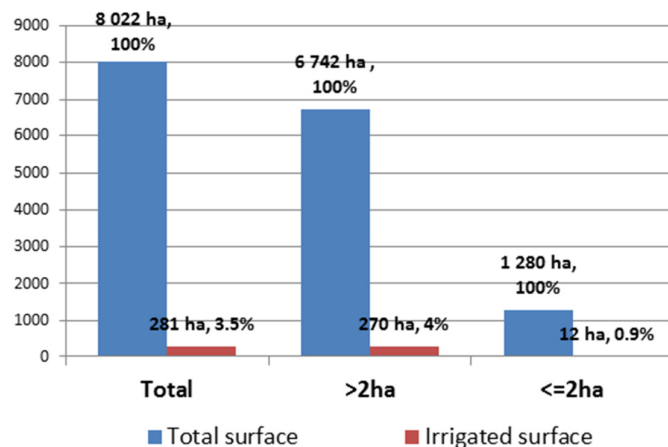
²¹ Espalier is the horticultural and ancient agricultural practice of controlling woody plant growth by pruning and tying branches so that they grow into a flat plane, frequently in formal patterns, against a structure such as a wall, fence, or trellis, and also plants which have been shaped in this way. (www.wikipedia.com)

water, and plant tissue analysis for diagnosing fertilization requirements. Very few apply complex chelatic fertilizers with a well-balanced content of macro and microelements or growth stimulators– gibberellins, cytokines, etc.

The main factor that influences productivity is the administration of water to the plant. Irrigation is rarely used by Moldovan table grape growers. As grapes are resistant to droughts (due to deep soil penetration with their roots) and grow better on plots with steep inclines, table grapes are traditionally planted far from a source of water and on hilly land that cannot be used for other crops. Usually irrigated plots are used for other crops for which water is critical. Meanwhile, the efficiency of irrigated vine plantations is high in Moldova's conditions. Irrigation has a large effect, leading to a 1.5 to 2-fold increase in yields. With irrigation, larger bunches and berries can be grown, the productivity and sugar content increases, and the appearance and taste of grapes improves.²²

According to the Moldova Table Grapes Production Appraisal Database in 2009, only 3.5% of the table grapes area was irrigated.

Figure 12 Comparison of Irrigated v. Rain fed Table Grape Vineyards in ha and Percent of Total Area by Farm Size



Source: Data Base "Moldova Table Grapes Production Appraisal", August 2009

The chart above shows that large growers don't use much more irrigation than small ones. Thus, the mostly rain-fed crop in Moldova leads to similar table grapes yields for large and small growers. The application of fertilizers by bigger growers lead to better yields but this is also a function of the amount of precipitation if irrigation is not available. However, due to better application of plant protection practices and better cold chain management grapes from larger growers have a higher value and can be sold at higher prices. If irrigation would be applied at a greater extent for large growers, then the productivity would increase and the costs per one kilogram would diminish greatly.

In conclusion, Moldovan table grape growers rarely use irrigation, they use insufficient fertilizers, and growers don't adequately protect the shoots against the late spring frost (e.g. using smoke or sprinklers).

Varieties

The average area planted by table grapes growers per each variety is a small 2 ha. This means that the average table grape grower cannot fill a truck with 20 tons with the average yield of 6.7 tons per

²² "The establishment of vine plantations of table grape varieties" information guide, USAID/ADP, 2006

ha. In order to attain one full truck per grower, the average surface planted by growers per each variety should be not less than 3 ha (3ha x 6.7 t/ha = 20.1 tons) or the average yield per variety should be not less than 10 tons/ha.

Over diversification of varieties on the small plots of land has contributed to this current inability to harvest a full truck in a day. Harvesting in one day is important as it is necessary to keep the stem from browning and maintain the required shelf life.

There are 79 locally planted varieties (see full list in the Annex 1), but 10 of them are most prevalent, comprising 85% of the total surface area. The Table 8 below presents the main ten varieties planted according to the total area. The varieties in the table are arranged according to their harvesting period. The numbers in the boxes represent surface area farmed. The numbers on the right represent the tons harvested. The table also shows color by variety, and demonstrates that red, white and black varieties are present, but that particularly in the late season, black varieties dominate. Moldovan growers produce approximately 30,200 tons of Moldova variety, 4,700 tons of Rannii Magarach –and 2,700 tons of Muscat de Hamburg per year.

Table 7 Seasonality of Top 10 Varieties Grown in Moldova According to Planted Area, Hectares and Tons

Grape Color	Table Grapes	Periods of harvest, months and decades										Tons		
		July		August			September			October				
		3	1	2	3	1	2	3	1	2				
1	Cardinal			356										2385
2	Muscat Iantarnii			402										2691
3	Rannii Magaracea			565										3782
4	Victoria rusească/românească			292										1958
5	Codreanca			240										1609
6	Chasselas musque					146								979
7	Alb de Suruceni					321								2150
8	Muscat de Hamburg							203						1358
9	Moldova							3206						21478
10	Italia									102				682

■ 1 - Red varieties
■ 2 - White varieties
■ 3 - Black varieties
■ 4 - Varieties of red and white color which registering is pending

The top ten varieties are Cardinal, Muscat Yantarnyi, Rannii Magarachya, Victoria (Russian/Romanian), Codreanca, Chasselas Musque, Alb de Suruceni, Muscat de Hamburg, Moldova and Italia. Early varieties are considered all that precede Chasselas Musque, such as Cardinal, Muscat Yantarnyi, Rannii Magarachya, Victoria (Russian/Romanian), and Codreanca.

Among these varieties there are market winners that sell better than others such as Cardinal (a high value cash generator in the local market) and Codreanca (relabelled Black Magic by Italians) that sells well both locally and for even higher prices internationally. Another category of “market winners” is the grapes which store well (namely Moldova variety). Moldova variety is the most widely spread. It is a black, late variety and covers half of total areas planted with grapes in Moldova. Since its development by Moldovan scientists and registration in 1980 this variety gained a strong reputation among growers. This was due to very few options of table grapes varieties in the Soviet Union but also due to its superior resistance to frost, diseases, high sugar content and good storability.

According to MAFI, this variety comprises about 80% of Moldovan exports in the off-season. Recently, Moldova variety’s dominance has begun to spread other 3 varieties: Pamyati Negrulya, Pamyati Zhuravelya and Black Autumn. These are also black and late varieties but differ from Moldova in their taste and as they produce bigger bunches. Their storability is very good as reported by growers that already have marketed them via cold stores.

From the main 10 varieties presented here, the best business investments will represent black varieties both early and late which have bigger berries and bunches. These are Cardinal, Codreanca, Muscat de Hamburg, Moldova and presumably those 3 newly tested varieties.

There are also several seedless varieties developed by Moldovan Institute of Applied Science in Grapes and Wine in 2008 and 2009. Some of them can be quite promising as they were developed for Moldovan climate conditions and are resistant to frosts and diseases. Some local nurseries manifest interest in propagating them. Due to the imperfect system of intellectual property protection the original breeders who developed those varieties are inclined to keep them out of wide circulation. For these varieties Gibberellic acid can be successfully used to increase the berry and bunch size. Due to fragmented demand this substance is very expensive and is sold in very small quantities on the local market that leads to lack of interest in trading it from the input suppliers. Growers go abroad by themselves to procure Gibberellic Acid.

As over diversification of varieties is a problem for efficient cooling, consolidation into a few gainful varieties would increase the efficiency and profitability of the sector.

Seedless Varieties

There are 12 seedless table grape varieties registered in Moldova. Four are white varieties of which two are early, five are red, of which four are early and three are black, of which two are early. In total, 4 seedless varieties out of 12 are late varieties.

Although the majority of seedless varieties were created by national institutes over a period of 30 years, Moldovan table grapes growers are in the inception phase of commercially propagating seedless varieties. The main problems facing these seedless varieties in the market are: the small berry size and the fact that growers do not have information about working with this kind of variety. Recently the Moldovan Institute of Applied Science in Horticulture and Agri-food Technology developed several seedless varieties that have large berries, good storability, and good resistance to diseases and frost. By applying growth regulators to these varieties such as Gibberellic Acid their commercial use will be very promising. As these varieties are new and have a strong commercial perspective, ACED will disseminate information about them in partnership with the nurseries and variety breeders (“Authors”) to growers. ACED will encourage the Authors to sign collaboration contracts with nurseries for the propagation of these varieties for the benefit of the Moldovan table grapes sector.

2.1.3 Vineyard investments

According to the Ministry of Agriculture and Food Industry there were 62 nurseries in the period of 2006 - 2010. This number had a positive evolution from an average of 40 nurseries in the period of 2002 - 2005.

If comparing these two periods in terms of surfaces planted than in 2006–2010 the average yearly planted surface was 3.8 thousand hectares and in the period 2002 - 2005 – 2.6 thousand hectares. At the same time, the import of plants decreased from an average amount of 4 thousand to 1.6 thousand plants per year. This means that while surface areas under production grew, production of plants by local nurseries developed. This is clearly seen in the table below.

Table 8 Evolution of Table Grape Plants Production and Establishment of New Plantations

Indicators	Average, 2002-2005	Average, 2006-2010	Change in average '06-'10 compared to '02-'05
Number of nurseries	40	62	155%
Production of grafts, ha	1394,5	1415,4	102%
Production of rootstocks, ha	537,5	844,2	157%
Production of grafted cuttings, mil	15,7	15,0	96%
Production of grafts, mil	6,3	7,1	113%
Import of plants, mil	4,0	1,6	40%

New plantations, thousand ha	2,6	3,8	146%
Cancelled plantations, thousand ha	1,6	2,2	138%

Source: Ministry of Agriculture and Food Industry of Moldova

The average price for a vine from local nurseries is \$1.20 per plant. In average 3,300 vines are planted per hectare. The total investment in establishing and maintaining a modern vineyard up to the fruit bearing period (which is the third year after plantation) is \$15,000 per hectare.

2.1.4 Cold Chain Management

The aim of the cold chain is to extend grapes' shelf life, slow the aging process, maintain their quality and taste, maintain resale value, and reduce losses while complying with safety standards that prevent contamination of the edible products, and create or increase revenues throughout the value chain.²³

Traditionally referred to as the "Cold Chain", it can be reduced to its most basic elements as follows:

1. Harvesting
2. Pre-Cooling
3. Cold Storage (commonly includes humidity and other controls for produce)
4. Cold Transportation
5. Wholesale/Retail temperature controls

The vast majority of Moldovan table grapes are selling in the bottom rung of the export markets because they make limited cold chain use. According to our calculations, 10-12,000 tons pass through Moldova's cold chain. Currently, no producers pre-cool table grapes due to the lack of pre-coolers in Moldova. According to our analysis, only 7% (3,747 tons under OCG 1) from the total volume of fresh grapes production can potentially respond properly to market requirements in the near future, however even these advanced producers do not pre-cool. The market requirement is to harvest large volumes of uniform good quality grapes, cooled by being put immediately after harvest into refrigerated trucks and transported to the pre-coolers so that they are cooled within hours of harvest.

The use of a pre-cooling tunnel reduces cooling time, removing the field heat very quickly. Potential for bunch deterioration is reduced and soon after the treatment, grapes can be stored or shipped in the optimal condition.²⁴ Furthermore, temperatures must be maintained throughout the chain to maximize shelf life.

Temperature is the most important determinant of the shelf life of fruits and table grapes. The optimum recommended temperature for grape berry storage is -1.0 to 0° C. As it is shown below the lower the temperature the smaller the transpiration of the grapes will be, leading to a longer shelf life.

Table 9 Table Grapes Rates of Respiration (of grape clusters, i.e. berries + stems)

Temperature	ml CO ₂ /kg·hr ²⁵
0° C	1 - 2
5° C	3 - 4
10° C	5 - 8
20° C	12-15

Source: "Technical Input for Improved Cold Store Operations in the Republic of Moldova", USAID/ACED, August 2011

²³ "Technical Input for Improved Cold Store Operations in the Republic of Moldova", USAID/ACED, August 2011, page 7

²⁴ FAO, "GRAPE: Post Harvest Operations", 2005, page 20

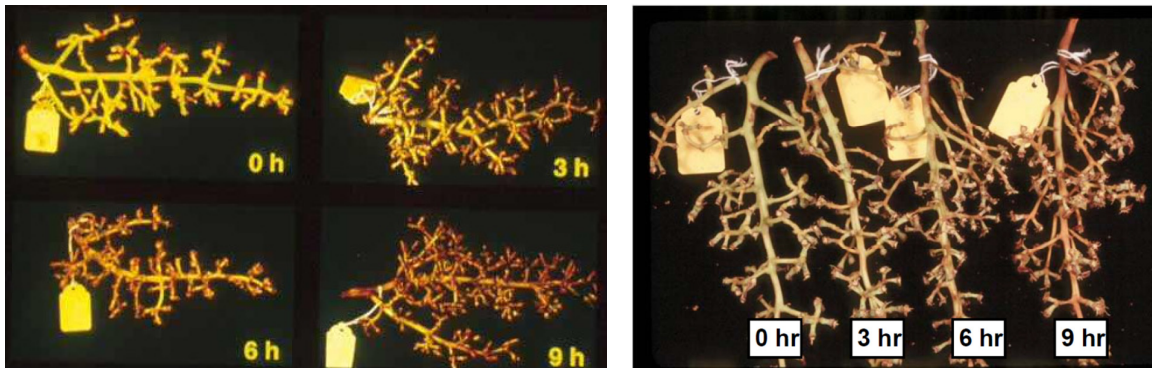
²⁵ To calculate heat production, multiply ml CO₂ /kg·hr by 122 to get kcal/metric ton/day

Humidity is the second most important factor that has to be controlled after harvesting. The optimum relative humidity (RH) in which table grapes have to be kept is 90 – 95 % RH. As the stem respiration rate is approximately 15 times higher than the berry respiration, it is critical to keep water in the stem. If not, the stem becomes dry and brown (and the berries detach more quickly). This problem is universal with Moldovan table grape producers, who need to learn how to eliminate this brown stem with better cold chain management.

The photos below demonstrate two tests performed during a period of 6 days. In each experiment 4 samples of stems were kept from zero to nine hours (0, 3, 6, and 9 hours respectively) at a temperature of 32°C and relative humidity of 80% before being put to cool at a temperature of 0°C.

After 6 days in the cold storage, the berries were removed from the bunches and the stems assessed. The level of humidity in the stems differed so that the one that was stored first (0 hours) had the greatest retained humidity. The stem that was stored after the longest delay (9 hours) became entirely brown due to late cooling and high loss of humidity.

Photo 3 Stem Browning Due to Delays Before Cooling, 32°C/80% Relative Humidity + 6 days at 0°C/80%RH

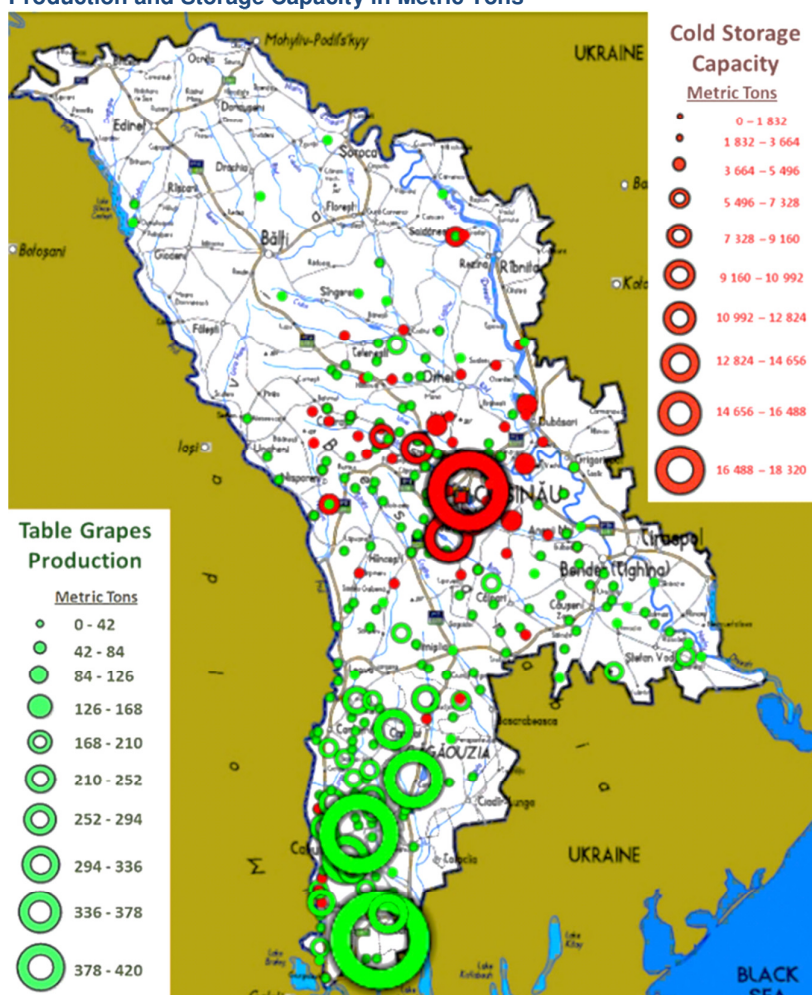


Source: "Harvesting, handling and packaging of table grapes for export", [http://www.docstoc.com/docs/95754676/HARVESTING -HANDLING-AND-PACKAGING-OF-TABLE-GRAPES-](http://www.docstoc.com/docs/95754676/HARVESTING_AND_PACKAGING_OF_TABLE_GRAPES), pg. 20.

Because of this stem browning, which is not accepted for high quality retail, cold storage warehouses are an essential supporting component impacting the table grapes value chain.

Another issue is the large distance from the Moldovan vineyards to cold chain infrastructure. As seen from the map below, major fresh grape production is concentrated in the south of Moldova (Cahul, Cantemir, Comrat, Ciadrlunga, Taraclia, Vulcanesti and Stefan Voda raions). In the south, approximately 30,000 tons of fresh grapes are produced every season while the functional cold storage capacity there is only 4,000 tons. In the central part of Moldova the cold storage capacity is 90,000 tons. However, the total table grapes production is estimated in the center at 20,000 tons.

Figure 13 Concentration of Table Grapes Vineyards and of Cold Storages Across Moldova, Volumes of Production and Storage Capacity in Metric Tons



Source: Product of present research, based on data collected - USAID/ADP, "Moldova Table Grapes Production Appraisal" survey, August 2009 and USAID/ACED, "Demand Assessment for Stone Fruit and Table Grape Pre-cooling Services in the South of Moldova", August 2011

The average distance from Moldova's south to center is 150 km. A loaded 20 ton truck takes up to 4 hours to reach cold stores in the center. The majority of traders buy table grapes from fields in the south and keep them in their own or leased cold storages in the center of Moldova. In the best case scenario, 20 tons of grapes are collected during 8 - hours, plus transported for 4 hours, plus unloaded and put to the cold storage for 2 hours. The total time is 14 hours between harvesting and cooling. This is 10 times more than ideally recommended. As a result, the quality and value of grapes is lost due to the lack of quick pre-cooling and cold stores located near the table grape fields.

Although along the Moldovan table grape value chain a volume of 10 to 15 thousand tons pass through the cold chain every year, there is a lack of deep knowledge regarding cold storage operations, refrigeration basics, refrigeration repair and maintenance, logistics, postharvest handling science and methodology, and a general lack of business acumen, especially in the marketing arena.

There are noticeable issues related to the cold storage facilities. Modern design facilities have recently been built or are currently under construction across Moldova. But lack of humidity controls and pre-cooling rooms as well as inappropriate loading dock patios still remain problems coming from the lack of knowledge about the respective importance of these items. Thus the development of a cold chain for handling produce is imperative.

2.2 Characteristics of Market Channels

General Description

The main Moldovan table grapes marketing channels are the export and domestic market channels (Channel 1 and Channel 2 respectively). The table grapes passing through Channel 1 are sourced from all types of growers: large, medium and small. However, large and medium growers have the dominant share. Channel 2 is dominated by grapes being sourced from medium and small growers.

In Channel 1 large growers organize harvesting, packing, storing, and transport to the external wholesale markets and sell at the open air truck market operating as trader/exporter and wholesaler there. The large growers that export by themselves have their own cold stores and can keep grapes for the off-season. Small growers that sell their grapes in the high season to traders who keep it for the off-season and then sell to exporters also are part of Channel 1. The grapes sold through Channel 1 have a better quality and a higher price. Subsequently, Channel 1 participants obtain higher margins.

Channel 2 and the domestic market is mostly represented by small growers and to a lesser extent by medium growers that have earlier varieties of predominantly light colored grapes and have smaller amounts of dark colored grapes. These growers usually sell their products by themselves at the wholesale market or to traders that operate in local wholesale and retail markets. As export traders will not accept grapes of poorer quality, by default, they are sold in the local market. Due to the fact that a lot of grapes do not succeed to be bought by traders for export during the high season, early grape varieties generally go to local markets for a smaller price.

Channel 1. Export

The average export price received by Moldovan table grape exporters is approximately \$US 2.80/ kg or higher (without VAT) at the importing country truck market in the off-season. In the high season it is \$US 1.40. The main clients at the truck market are retailers of different categories and Hotels, Retail, or Cafes (HoReCa) as well as regional traders that come to the wholesale market to source their supplies.

Exporting buyers of OCG 2, 3 and 4 have their own trucks or hire trucks from transport companies and deliver the produce to the open wholesale markets abroad. Usually they sell the grapes for no longer than 5 days due to the daily incremental costs they incur in the open market.

For late varieties, these growers sell produce to traders that store the grapes. There are also exceptions when growers store their grapes for the off season on their own in leased cold stores. The average price for storing 1kg of grapes in a leased cold storage during one season is \$0.09/kg. The price grapes garner post-storage in the off-season is about \$US 1.25. The next steps are made by traders that export the grapes or sell locally at the open wholesale market.

Channel 2. Domestic Market

In Channel 2, in the local market early varieties are sold for \$US 0.53/kg or cheaper from the field. Late varieties are sold for \$US 0.53 or higher from the field. OCG 3 growers sell their early varieties to local traders or go directly to the wholesale markets (mainly in Chisinau).

A large part of OCG 4 growers sell their grapes at local wholesale markets in Chisinau or in their raions in bulk or retail at the open markets. Usually they command cheaper prices. While smaller growers are more likely to sell domestically, a part of these small farmers who have late varieties like Moldova and higher quality grapes sell their produce to traders and exporters that put the grapes in cold storage to be sold in the off-season.

2.2.1 Volumes Sold Through Each Channel and Their Value

About 30 thousand tons of Moldovan table grapes are exported yearly to regional markets. This represents 56% of total commercial grapes produced seasonally in Moldova.

As shown in Table 10 below, the largest table grapes volumes are sold by OCG 4 (small growers, 25,172 tons). OCG 4 comprises 29% of the total export volume. However, OCG 4 is exporting only 34% of its total output or 8,623 tons out of 25,172 tons. Thus, OCG 4 is the main supplier of grapes in the local market.

The greatest volume of exports is performed by OCG 3 (medium sized growers) with 10,073 tons exported: 65% of the OCG 3 total output and 34% of total exports of table grapes.

Table 10 Growers Production and Trade by Channel and Output Capacity Group

Indicators	OCG 1	OCG 2	OCG 3	OCG 4	Total
OCG output, tons	3,745	9,333	15,497	25,172	53,747
Exported volume, tons	3,371	7,933	10,073	8,623	30,000
% in OCG output	90%	85%	65%	34%	
% in total exports	11%	26%	34%	29%	100%
Domestic sales volume, tons	375	1,400	5,424	16,549	23,747
% in OCG output	10%	15%	35%	66%	
% in total domestic sales	1%	5%	21%	65%	100%

Source: Based on data collected - USAID/ADP, Moldova Table Grapes Production Appraisal, August 2009

From its total output of 9,333 tons OCG 2 is exporting 85% or 7,933 tons. 90% of OCG 1 production is exported. Table 10 again demonstrates that the capacity to export is determined directly by the capacity to form uniform deliveries in terms of volume, quality and value.

2.3 Main Functions & Players along the Value Chain

The main functions along the Table Grape Value Chain are: i) production of planting material, ii) growing, iii) harvesting, sorting and packing, iv) storing and v) Wholesale and Retail distribution. Other functions include inputs supply, packaging, transport, and service provision.

There are currently three main types of players adding value along the Moldovan Table Grapes Value Chain: I) Growers, ii) Traders and iii) Exporters. The other players are input suppliers, nurseries, packaging producers, transporters, large wholesalers and distribution centers, large and small retailers, and HoReCa.

Table 11 Main Functions from the Key Actors in the Table Grapes Value Chain

Players	Functions
Nurseries	- Growing planting material, - Recommending best varieties to growers
Growers	- Growing, - Harvesting, - Sorting, - Packing, - Largest growers are storing and exporting/ distributing, - Local wholesale
Traders	- Storing, - Post-storage sorting, - Provide packaging
Exporters	- Transport and paperwork to get to market - Wholesale (in export truck market)

Nurseries

There are about 62 table grape nurseries in Moldova. The average price for a grafted plant from local nurseries is \$1.20 per plant. Italian certified plants cost \$2.10 per plant at the importer warehouse. The EXW price is \$1.50 plus transportation, VAT (20%) and other costs comprise the additional \$0.60. The specialists consider the difference between the local and imported vine price as insignificant due to the much higher quality of Italian plants, which are clean from diseases, virus-free, more productive and are certified. Some local nurseries as “Vitis Cojusna” Ltd make active efforts to produce certified plants of high biological category (high productivity and clean from diseases). This could be achieved 3 – 4 years from now (2015).

Grape nurseries have a big impact on the varieties planted by growers. As the major part of small growers do not know the marketing information related to varieties and traders and exporters do not understand too much about grape varieties (besides the traditional ones with which they are working) the grower’s main source of marketing information related to varieties becomes the nursery. Nurseries will try always to promote those varieties they think can grow better and are good for the market but their marketing information is far from perfect. In such a way nurseries, based on the information they have about market requirements in terms of varieties plan and determine the varieties that are planted by Moldovan growers.

Plantation Designers

In Moldova the Law on Grapes and Wine requires that vine plantations with areas larger than 0.5 ha be established only on the basis of projects developed by the institutions authorized by the Ministry of Agriculture and Food Industry. The institutions authorized to develop projects provide project development and site selection services based on commercial contracts.²⁶ The table below presents the list of main plantation design companies.

Table 12 List of Companies and Institutions Authorized to Develop Projects for Vine Plantations

Company	Address	Contact
IM Weis-MD Vine Co Ltd	Chisinau, str. Vlaicu Parcalab,	22-04-82
Duo-Agro Project Ltd	Chisinau	069717538
National Institute of Grapes and Wine	Chisinau, str. Grenoble, 128	28-50-25, 78-77-67
FPC Codru-ST Ltd	Chisinau, bd Stefan cel Mare,	21-22-39, 22-73-66
ASP SPM-Grup	Chisinau, str. Costiujeni, 16	75-35-70, 78-75-12
Territory Organization Project Institute	Chisinau, str. Ialoveni, 100B	72-35-70
Tanjar-CO Ltd	Chisinau, str. Academiei, 8/2	72-45-70
National State Soil Protection	Chisinau, str. Grenoble, 106	73-78-20, 73-50-33

Growers

We have grouped commercial growers into three broad categories based on their areas under production:

- Large growers – considered to be those that fulfill two conditions: i) have big surface areas (more than 18 ha) and ii) have the ability to provide more than half a truck, one truck or more per variety per day.
- Medium growers – are those growers that have more than 8 ha and can provide in one day between 5 to 10 tons of grapes of one variety.
- Small growers – are the growers with surfaces greater than 0.5 ha and less than 8 ha that have the ability to provide less than 5 tons in one day.

Traders

There are traders operating in the local market and traders that specialize in working with exporters. Local market traders represent distribution companies that buy from the field and distribute to

²⁶ “Moldova Table Grapes Production Appraisal”, August 2009

Moldovan supermarkets and individuals that buy from the wholesale market and sell in open markets directly to consumers.

Traders that work with exporters actively pursue the goal of selling in the off-season. They buy late grapes varieties in September and October and store them in their own or leased cold storages. Then in the off season: typically November, mostly December and January, they sell the grapes to the exporters. These types of traders are mainly located in the central raions of Moldova, such as Ialoveni, Straseni and Chisinau Municipality where the cold stores of various sizes, types and quality are concentrated. The highest concentration of traders specialized in storing grapes is in Costesti Village, Ialoveni Raion where total cold storage capacity is about 10 thousand tons.

Exporters

The classic table grape exporter is an individual that buys from traders with cold storage or directly from the field and uses the services of a specialized service company, which provides the necessary buying and selling paperwork (contract, phytosanitary certificate and certificate of origin).

Particularly for Russia, it is mandatory to hire a company to carry out the import paperwork. Some of such service providers operate for less than one year under one name and then register another company to avoid taxation. After receiving all import documents the exporter then typically continues taking the produce to a wholesale market in the importing country, e.g. Pokrovka (Moscow). These Moldovan exporters are usually transportation companies shipping a large assortment of fresh fruit to Russia (and other countries) that bringing produce not only from Moldova, but also from other countries, such as Serbia, Bulgaria and Poland.

The exporters of fresh grapes can also represent some big growers that can store and export their grapes. They can be also transport companies that buy locally and export the grapes. All of them use the same scheme as described for the classic exporter. Grading is done by traders/ owners of cold stores. Annex 2 presents the list of table grape exporters with official permission to export to Russia.

Drip Irrigation Suppliers

Vineyards can be irrigated by introduction of moisture in soil (plowing or harrowing), sprinkling, use of underground irrigation systems, dispersion, and drip irrigation; however the most widespread irrigation methods are sprinkling irrigation and drip irrigation.

Drip irrigation ensures the most efficient use of water, mineral fertilizers and labor, uniform distribution of water in the root area and achievement of high yields. The drip irrigation system includes a water source, the distribution and control unit, pressure controller, subterranean pipes, distributing sleeves and 1-2 droppers at each vine placed directly on the soil or at the height of 20 cm.²⁷ Table 13 below presents some of the Moldovan companies providing irrigation systems.

Table 13 Companies Distributing Irrigation Systems

Company	Contact	System type	Origin
Trio LTD	43-23-16, 43-21-61	Drip	USA, Ukraine
MOLDAGROCHIM LTD	22-35-97; 22-47-82; 22-41-17	Sprinkler, Drip	USA
Eco-Irigare LTD	43-04-19; 44-13-35	Sprinkler	Moldova; Austria
Agro-Logistica LTD	22-31-91; 27-00-40	Sprinkler	Russia
Agrodor-Succes LTD	59-64-76; 71-58-62	Drip, Sprinkler	Greece
Agrofit-BONUS LTD	27-97-37; 27-97-36	Drip, Sprinkler	Spain, Greece
Strimedit LTD	24-34-88; 22-27-42; 24-46-69	Drip	USA, Ukraine
A.I.K. LTD	79-39-63	Sprinkler, Drip	Ukraine
Agrimatco-Service LTD	22-67-73; 21-09-60	Drip	USA

²⁷ "The establishment of vine plantations of table grape varieties" information guide, USAID/ADP, 2006, page 9

Packaging producers

There are 14 active packaging producers in Moldova (Annex 3) that produce wood boxes for table grapes. The advantage of wood packaging is mainly in its strength and its availability on the local market. However, it has disadvantages related to marketing and manipulation. Wood isn't conducive to printing promotional information (logo, phone number, branding, etc.) and it is heavier, so harder for workers to lift.

Photo 4 Example of Wood Boxes of 9 Kg



Source: "Iri-Carmen" Ltd, table grape grower

Cardboard packaging has several advantages: it is printable and can include advertising, it is lighter, more convenient to handle, and is recyclable. However, the cardboard has to be strong enough to resist humidity and stacking pressure, which implies higher price per box.

Box producers haven't seen the need to invest in the production equipment needed for special high resistance cardboard and box assembly. However in 2011 several local companies bought cardboard boxes assembly lines that could provide high quality boxes of 5 kg. The Moldovan Association of Grapes Producers and Exporters could play the role of demonstrating a consolidated regular demand. Potential providers of cardboard boxes of 5 kg for table grapes are companies such as: Chisinau Cardboard Plant (cardboard producer), Remprocom SRL (TM "Agrotara"), and Agro-Product Ltd (cardboard boxes assembly line).

Photo 5 Example of 5kg Cardboard Box that Can Be Assembled In Moldova



Source: "Jotagris" JSC, Importer, Lithuania

Residue Testing Laboratories

In Moldova are several laboratories accredited / authorized for issuing safety certificates and test protocols for export of fruits and vegetables to the Russian Federation. Their names and addresses are in Annex 4.

2.4 Transactions between Players and the Flow of Goods from Production to End Market

Within the Table Grapes Value Chain, transactions happen between the following players:

1. Input suppliers – Growers
2. Growers – Traders
3. Traders – Exporters
4. Exporters – Retailers

In general, along the table grape value chain transactions that involve larger companies are made by bank transfer and are supported by contracts. The others very often use only cash or partly cash/ partly transfer without any contract.

Input suppliers - Growers

Transactions between medium, small growers and such input suppliers as plantation design companies, seedling producers, and some irrigation system providers usually involve cash only payments which are supported by a contract. Growers receive invoices from their suppliers.

Plantation design companies provide growers with detailed consulting on adequate placement, soil composition, planting and varieties recommended for a specific location. Usually small growers with a plot of land in a given location ask these service providers to make a plantation design for that specific plot.

In case the Plantation Designer does not recommend the grower plant grapes on that plot, a conflict can appear. At the insistence of the grower the service provider then develops the Plantation Design but requires the grower to take all the responsibility and risks with the future plantation in a separate document signed by the grower. Thus the grapes produced on such plantations tend to be of poor quality and reportedly such cases are frequent.

Small growers use transfers and contracts when buying agricultural machinery. For buying Fertilizers and protection solutions growers do not make contracts with suppliers but receive only invoices. Companies providing fertilizers and crop protection solutions give growers detailed data on the solutions' characteristics and instructions for use. Due to the competition in this market these companies provide also consulting in the field to be sure that their products are properly used and produce the desired effects, in such a way keeping clients satisfied and loyal.

In the case when transactions are made between a large grower and input suppliers, contracts are very often used due to the bigger values involved. Still, in some cases, money is partly transferred and partly paid in cash to avoid payment of VAT or diverse taxes.

Growers – Traders

The transactions between traders and medium and small growers are made only with cash. Large growers may use contracts and bank transfer, but this is only to show activity on their balance sheets, and still greater sales are performed with cash.

In the majority of the cases growers are found by traders. In high yield years with larger than normal supplies (typically once in four years), growers are forced to find traders and lower their sales prices. Each year the price is dictated by the market situation. Usually the late varieties that are bought by traders for storage are being sold for less by growers from southern raions because the grapes production is concentrated there (and bigger volumes are sold) and because the traders' transport costs are higher as they transport the grapes to the central raions where cold storages are located. In central raions grapes are more expensive.

Traders usually complain about grape quality suggesting that better quality is needed. In high supply years, the growers' power of negotiation drops dramatically. They still operate profitably, but with a lower margin. In the low supply year growers obtain good prices.

Traders – Exporters

All trader - exporter relations use contracts and necessary documents such as bookkeeping, transport, and payment records. The payment is performed partially by money transfers, partially in cash.

There are traders that buy grapes for storing and selling in the off-season and specialize in better quality produce. They understand the quality of grapes according to the appearance the vines in the growers' vineyard, color of leaves, etc. Even if the grapes are nice looking according to the appearance of the plant and color of the leaves, one can judge if a plantation is infested by fungus or not. Usually growers don't understand the behavior of such traders that when seeing the vineyard and plants refuse to collaborate not mentioning the cause. Other traders with less expertise do not differentiate and purchase infested grapes that will create problems in the cold storage. The more selective traders own their own stores or lease them.

Another type of traders is those that operate only during the season, also exporting fresh produce. Due to the fact that storage is not required, their criteria are healthy and nice looking produce of varieties that have high demand in the end market.

Exporters – Retailers

There is a generally accepted and applied "scheme" of importing produce to regional CIS markets, which is based on avoiding taxation. The provision of this information should not be interpreted as advice to use the existing mechanism. Despite this, sellers report that attempts to avoid this mechanism currently lead to failure in penetrating the Russian market.

Russian distributors and average size wholesalers often are not registered and licensed for external trade. Therefore, they use Brokerage Service Companies (hereinafter referred to as BSCs) to handle import procedures. BSC do not ever take over the product. Usually big distributing companies can have their own BSC, but in all cases they are kept as a separate business entity. After customs clearance the truck either goes to the distributor or Pokrovka/ open air truck market.

The indicative price is a price that is considered by the Customs to be a minimum fair price for a certain product from a certain country. Theoretically the indicative price is a method of preventing the lowering of the import prices and avoiding taxes. In practice, the indicative price is the price that all market players operate with for filling out paperwork when importing produce and, in the majority of cases, it is much lower than the real price of the produce. At the truck market exporters sell their products for cash and send money home by international money transfer services such as Western Union and Money Gram.

Chapter III Analysis of Value Added

3.1 Channels and Players Capturing the Most Value

We can distinguish value captured depending on the market channel and the sale period. The export markets offer better value than local markets and consume bigger volumes at this value. During the off-season prices are much higher than in the high-season. Volumes that can be sold in the local market in the off-season are much lower than in external markets. Bigger growers can sell straight to export markets and integrate all the functions described in Table 14 (growing, trading, exporting) also garnering all the margins along the chain, while concurrently facing the risks associated with marketing. The margin of the grower who sells the produce directly from the field in the high-season is just \$0.25/kg (no cold storage). In the off season growers that store the grapes can gain a margin of \$0.75/kg. If the grower is also conducting the export during the off-season then his margin would be \$2.00/kg.

The off-season columns in Table 14 below relate to late grape varieties, predominantly black. The high-season column relates to all varieties sold until late October.

During the off-season the greatest value added is in Channel 1 (export) - \$3.81/kg (price paid by consumer). In the local market during the off-season the average price is \$3.22/kg.

Table 14 Costs and Margins Captured by the Table Grapes Value Chain Participants

Sale season		Off-season		High-season	
Market		Export*	Local	Export*	Local
Participants	Functions	Costs and margins			
Grower	Variable costs	0.28	0.28	0.28	0.28
	Margin from field in high season	0.25	0.25	0.25	0.25
	Cost to next stage	0.53	0.53	0.53	0.53
Cold storage (performed either by grower, trader or exporter)	Transport	0.01	0.01	-	-
	Packing	0.07	0.07	0.07	0.07
	Storing	0.09	0.09	-	-
	Margin from cold storage in off-season	0.50	0.50	-	-
	Cost to next stage	1.20	1.20	0.60	0.60
Exporter/Wholesaler	Transport	0.22	0.03	0.19	0.03
	Customs clearance	0.05	-	0.05	-
	Banking costs	0.02	-	0.02	-
	Access to sale point fee	0.04	0.01	0.04	0.04
	Other costs	0.03	0.03	0.03	0.03
	Margin in the end market	1.25	1.10	0.45	0.18
Cost to next stage	2.81	2.37	1.38	0.88	
Retailer	Costs & margin	0.42	0.36	0.21	0.13
VAT, 18% for Export and 20% for Local		0.58	0.55	0.32	0.20
Consumer, price includes VAT		3.81	3.28	1.91	1.21

*Export to Russia

Source: Based on information collected in "End Market Study for Fresh and Dried Fruits in Russia", USAID/ACED (Prices), September 2011 and on interviews with the Moldovan Association of Grapes Producers and Exporters

Grower and trader variable costs do not differ by Channels. Only exporters incur additional costs that are not applicable for Channel 2 (local market). The traders that buy and store the produce for the off-season incur costs such as packaging, transport from field to the cold storage, and storage. These

costs amount to \$0.19/kg so that the price the trader paid for the grapes plus cost is \$0.72/kg. The traders' margin is \$0.53/kg, 43% of the price offered to the exporter of \$1.25/kg.

For the export channel, the principal variable costs are transport, customs clearance, interest and other bank fees, the fee for access to the point of sale, and miscellaneous "other costs". For the domestic wholesale, costs include transport, access to point of sale, and other. The exporter costs add up to USD 0.36/kg during the off-season and USD 0.33/kg during the high season. For the domestic wholesaler, the corresponding costs are USD 0.07/kg during the off-season and USD 0.10/kg during the high season.

During the off-season, the exporter applies a margin of USD 1.20/kg to account for risk; the corresponding margin for the high season is USD 0.45/kg, reflecting the lower risk during that period. The corresponding values for domestic wholesalers are USD 1.10/kg during the off-season, and USD 0.18/kg during the high season.

The exporter adds USD 1.61 to the final price during the off-season, and USD 0.78 during the high season, accounting for about 42 percent of the total consumer price in both seasons. Domestic wholesalers add USD 1.17 and USD 0.28 to the final price for off- and high season, respectively, corresponding to 36 and 23 percent of the consumer price.

In absolute values, the profit "winners" are traders and exporters, who also face greater risks. Large producers and large traders that have greater volumes of throughput also capture the most value.

3.2 Comparative Costs and Productivity Analysis

In order to make a comparison between costs incurred by Moldovan growers and by competitor country producers, in Table 15 below we present Turkey as the country providing the most direct competition.

Turkey is located in a convenient region for grape growing as the gene center of the grape-vine as well as having quite an old and long standing vineyard culture. Vine growing is one of the most important branches of agriculture in Turkey.²⁸

Table 15 Comparative Productivity Analysis

Indicators	Turkish producers	Moldovan producers		
		Large growers, highest technology	Medium growers, partial use of highest technology	Small growers, basic technology
Product value, \$/ha	6,039	6,334	4,684	2,704
Variable costs, \$/ha	2,847	3,463	2,734	1,846
Gross margin, \$/ha	3,192	2,881	1,950	858
Gross margin, %	53%	45%	42%	32%

Source: 1. Energy and cost analysis of sultana grape growing: A case study of Manisa, west Turkey, September, 2009
2. Ghid privind argumentarea economică a activităților din agricultura Republicii Moldova, 2009

According to the "Energy and Cost Analysis of Sultana Grape Growing: A Case Study of Manisa, West Turkey" study developed in 2009, the values of gross product and total variable costs were \$ 6,039 and \$ 2,847 per hectare respectively. In Moldova growers that respect the recommended growing technology have a gross product value of \$6,344 and total variable costs of \$3,463 per hectare.

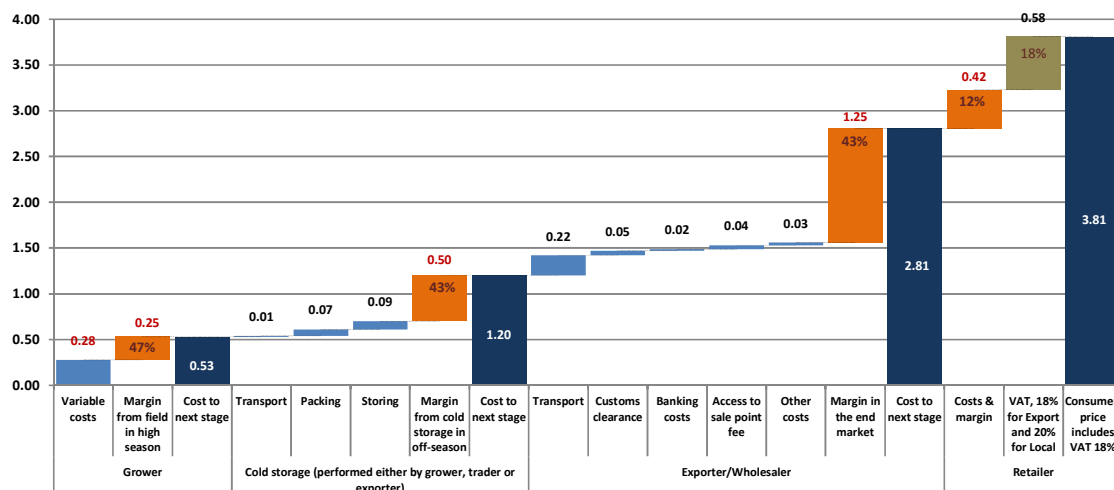
²⁸ Energy and cost analysis of sultana grape growing: A case study of Manisa, west Turkey, September, 2009

Thus the gross margin in Turkey is \$3,192/ha and in Moldova it is \$2,881/ha. Moldovan companies that apply partially the recommended technology have a product value of \$4,684/ha and total variable costs of \$2,734/ha that results in a gross margin of \$1,950/ha. Local family farms' product value is \$2,704/ha and total variable cost is \$1,846/ha and the gross margin is \$858/ha. Thus, Turkish grape production is more competitive in value, and its break-even point is lower than Moldovan production utilizing recommended technology.

Typically Moldovan grapes are not targeting a specific market from the start. Therefore, the costs do not differ much between grapes sold domestically and those exported. Only the largest growers understand the requirements of the export markets and make additional financial efforts to capture more value through different practices leading to quality and productivity improvements²⁹.

Gross margin indicator can be considered when judging whether the risks are covered or not. The grower's gross margin must generally be over 30%. This is needed as a buffer against price fluctuations of either raw materials, inputs or the price received at market.³⁰ Figure 15 below shows graphically how variable costs, gross margins and costs change for next stages. In relative values we can see that in the off-season – Channel 1 Growers selling from field incur a 47% gross margin (\$0.25/kg), Growers selling after minimum one month of cold storage incur a 63% gross margin (\$0.75/kg), Traders with cold storage – 43% gross margin (\$0.50/kg), Exporters – 43% gross margin (\$1.25/kg).

Figure 14 Costs, Margins and Value along the Channel 1 of the Table Grape Value Chain, \$/kg (% for gross margin)



Source: Product of present research based on information collected in "End Market Study for Fresh and Dried Fruits in Russia", USAID/ACED, September 2011 and on interviews with Association of Grapes Producers and Exporters

²⁹ It is hard to quantify precisely the differences between growing costs incurred by small growers and large growers that have a targeted end market. Additionally growers cannot be strictly divided by Channels as their produce is bought both by exporters and by local traders.

³⁰ FAO, EBRD, Agribusiness Handbook, Fruit and Vegetables Processing, page 17.

Chapter IV Linkages and relationships within the Value Chain

4.1 Vertical linkages

In the system of modern retail (with a large role for supermarkets), educated final consumers demand high quality standards for products they buy. As the region adapts to those standards, the final consumers increasingly require a certain minimum level of fruit quality and supermarkets demand this from their suppliers. As modern retail becomes a more and more important player in the regional markets, its requirements: quality, packaging, terms of delivery and payment, become the general “rules of the game” starting to being adopted by other distribution channels, like traditional retail and open markets. Currently, there is a gap between the demand characteristics from modern retail and other channels; however, with the growing market share of supermarkets, this gap is shrinking.

Following the retail chains, the wholesalers/distributors that are listed as suppliers of these supermarket chains have the next largest market power. These distributors have the same quality requirements as modern retail and they require consistent supply of significant volumes. The Moldovan exporters that can meet those requirements are those who have the access to the largest producers on the Moldovan side of the border. These exporters can deliver products to both distributors (e.g. destined for supermarkets) and the open wholesale truck markets, in case the quality of the produce is below supermarkets requirements.

Because of the problems related to fruit uniformity, quality and lack of consistent supply, there are not many of such big exporters in Moldova, and usual they are the companies that are fully integrated, from producing to storing, with proper packaging that also deliver grapes to the market.

A majority of exporters are of small and medium size, often transportation companies having one to several trucks. They deliver grapes to wholesale markets, like the Pokrovka open air truck wholesale market in Russia, and the fruits there are sold further through traditional retail or retail open markets. Due to the lack of table grape grower cold stores, these small and medium traders have a bigger bargaining power than producers in the high production season, due to the large supply of grapes. However, in the off-season, those producers who own or have rented cold storage facilities have more bargaining power and earn higher margins due to still big market demand and much lower supply available.

Both with large fully integrated exporters and smaller ones, exporters are the only node in the value chain that has more or less full information regarding end market requirements and to some extent also trends. The information about market requirements are delivered to producers in limited portions, mainly via produce specifications and volumes of produce negotiated.

Sometimes traders are exporters but usually they are separate. Being smaller by number than growers, traders have relatively more power than growers without cold stores. From the whole value chain, exporters are the ones that have highest margins, which can be seen on the Value Chain Map above. However, the Map describes the situation when all the distribution process is running smoothly without encountering major problems. In fact, exporters are exposed to major risks, like high price fluctuation of the wholesale market, import bans (as with the Russia ban of 2006), etc. An additional risk exporters face is sourcing fruit from producers that could be rejected by sanitary control authorities in the country of import.

There are also risks of expenses related to high corruption in some of the regional market countries. In these conditions the high exporters' margins shouldn't be considered as a net unfairly high exporter profit, because they also use this margin to pad for risk.

Sometimes this potential profit and risks are shared between trader and producers. This happens in cases when the producer gives his grapes to the trader for storing without selling it and without paying a fee for storing services. The trader then sells grapes according to the market price at the time of selling and pays to produce a "fairer" price, depending on their agreement. In case of a price drop, the risks are also shared with producer.

The general rule of the information flow is that the closer to the end market the node is, the more information it possess. Producers have the least information about the end market. Sometimes, in case of small producers, the only information they get from trader is whether the quality of their products is good (accepted by the market) or bad, not entering into details. The more vertically integrated the chain is, the better information flow it has.

4.2 Horizontal linkages

Horizontal linkages within the table grapes cluster in Moldova are at the initial stage of their development in terms of cooperation. The Moldovan Association of Grape Producers and Exporters (MAGPE) has 144 members representing 10% of all growers and 25% of production volumes. Among the 144 members there are also traders and input suppliers. The association includes also wine makers so it is not made only of table grapes producers. From 140 association members there are 100 table grape growers. However, the cooperation between its members is mainly limited to learning about production issues, such as production technology by variety, thinning, integrated pest management, etc. This has a positive but limited impact on grapes uniformity and adopting new technologies. However it is still far behind the real cooperation needs for enhancing international competitiveness of the whole table grapes cluster in Moldova.

Currently, the association doesn't have much capacity for providing market information to members, and could benefit from ACED's assistance. Furthermore, they don't negotiate group discount prices for inputs or bring in much money. A small amount of dues per member pay for the executive director's salary.

Currently the sector is lacking obvious leaders who have the motivation, capacity, knowledge and skills to organize a group of producers to pursue joint commercial activity, including the sourcing of inputs and marketing. The Executive Director is an excellent source of knowledge and production advice to the other members. The President is a very successful business man who is therefore limited in time to organize group endeavors. There is currently no person in charge of marketing at the association, as there is no money for this salary in the current fees collected.

The main problems of horizontal linkages are absence of real cooperation in marketing and limited cooperation in production. Furthermore, there is a problem of lack of trust among farmers to group horizontally and sell together in cooperatives.

Moldovan table grapes compete in the low quality segment of the declining traditional and open markets, which will lead in future only to higher competition and shrinking producers' profitability if no real steps towards consolidation and joint marketing will be taken.

Chapter V Systemic Constraints, Upgrading Needs and Action Plan

5.1 Table Grape Value Chain Constraints

5.1.1 Business Enabling Environment

Aside from the free trade agreements listed above, there are non-tariff barriers for Moldovan table grapes such as an ad valorem tax in EU market that protects EU producers from external table grapes entering with lower prices and scrutiny of sanitary requirements in Russia and Belarus that led to the creation by the Moldovan Ministry of Agriculture and Food Industry of a list of accepted exporters to these markets. There is currently not full transparency regarding this process of list creation and acceptance.

At the local level, the table grapes sector faces the problem of high fuel prices in periods when fuel is needed the most. A government or bank supported financial instrument could be useful in order to ease the pressure on growers' cash flows in periods when there are big cash outflows and no cash inflows such as in spring.

There is a lack of good information about the characteristics of varieties which are registered in Moldova that physiologically adapt well to the local environment. This lack of information combined with the lack of information on market requirements leads to growers looking to foreign varieties that are not suitable for Moldova climate conditions and asking nurseries to grow varieties which are not tested and registered locally. After that, growers face the problem of low yields and other respective problems with those varieties. This is an institutional problem as the State Commission for Plant Varieties Testing and Registration (SCPVTR) should disseminate detailed variety descriptions of the plants it registers.

There is an important issue related to the permissible area for testing new varieties on grower land. A table grape grower that wants to register a new variety and additionally to carry out the tests required by SCPVTR on his own land is limited to only a 5 ha area for this purpose. New table grape varieties can be registered in Moldova after 7 years from the time of planting. The seven year period is composed of four years before the yielding period and then three years yielding. It is necessary to monitor three years after plants begin yielding due to the fact that seasonal weather conditions in Moldova change regularly. The 5 ha testing area limit is too small as opportunities can be lost in case the new variety shows very good results. It would be more efficient if the tester could take on the risks associated with planting new varieties and expand the testing area.

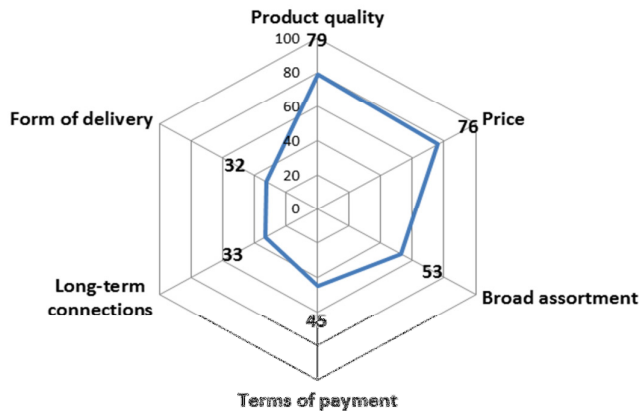
5.1.2 Constraints Related To Key Market Requirements

The survey called "Russian Retail Chains vs. Foreign Retailers: Changes within the Industry and Supplier-Retailer Relationships" identified the main criteria according to which Russian retailers select their fresh fruit suppliers.³¹ The main factors can be viewed in Figure 16 below. Most importantly, retailers pay attention to the product quality that should not have visible defects. A product with good cosmetic appeal is sold faster and translates into more sales. The second important factor for the retailers is price. The third is broad assortment that the supplier can provide, fourth: terms of payment. If a supplier wants to work with a retail chain it has to be able to wait for payment from 14 to 30 days or even more. The fifth important factor is long term connections. This means offering a uniform

³¹ "Russian Retail Chains vs. Foreign Retailers: Changes within the Industry and Supplier-Retailer Relationships", <http://www.impgroup.org/uploads/papers/4766.pdf>, page 5

product with strict, planned and reliable regularity. Last, sixth, is the form of delivery (to the supermarket warehouse). In order to partner with supermarket chains, these are the main aspects that a supplier should take into account and their relative importance (on a scale of 1 to 100) denoted by the numbers in Figure 16 below.

Figure 15 Criteria of Fresh Fruit Supplier Choice in Russian Fresh Fruit Supply Chain



Source: Based on data presented in "Russian Retail Chains vs. Foreign Retailers: Changes within the Industry and Supplier-Retailer Relationships" survey

The requirements above represent priorities for the Moldovan table grape value chain. For each of these there are constraints that will need to be mitigated. Below, ACED has designated the 5 highest priority improvements for the Moldova table grape sector, and provides a brief discussion of the existing constraints to achieving those improvements. A more detailed ACED action plan follows below in 5.2.

Market requirement #1: Cosmetic appeal

Lack of cosmetic appeal results from lack of knowledge and good thinning practice, as well as due to lack of knowledge in other aspects of table grape production technology including fertilization and plant protection practices. Furthermore, the majority of producers grow, harvest, handle and store table grapes improperly. This leads to large quantities of grapes with small bunches, small berries, and damages from diseases, pests, handling, and packing and storing inefficiencies.

The key markets of Moldovan table grapes require the following minimum quality characteristics:

- a. Minimum berry diameter: 20 mm and preferable bunch weight: 600 gr and higher
- b. Absence of physical damages
- c. There is greater demand for black varieties
- d. Clean and attractive packaging

In order to improve Moldovan table grapes' cosmetic appeal, ACED will provide training to producers, traders and exporters in:

- i. Berry diameter and bunch weight;
- ii. Physical damages;
- iii. Popular/ demanded varieties in key end markets;
- iv. Shelf life; and
- v. Packaging.

i. Berry diameter and bunch weight

Improvements needed: In order to raise the average diameter of berries and the weight of the bunch several tools can be applied. First is manual thinning of the bunches. The second tool is applying foliar fertilization for seeded and seedless varieties and Gibberellic acid predominantly for seedless

varieties. Third is use of irrigation. Another option to meet the berry and bunch size requirement is to use special varieties. Promising ones include Black Autumn, Pamyati Negrulya and Pamyati Jzuravelya, which are black seeded late varieties that are close to Moldova variety by visual and organoleptic aspects, but have larger berries and bunches.

Constraints: One of the biggest constraints for increasing bunch sizes is growers' misperception that thinning of bunches could lead to smaller yields per hectare. Growers do not recognize the need for thinning and do not know how to do this. Similarly, growers do not understand the need and know how to use Gibberellic acid (and calcium treatments). Because of the low demand for Gibberellic acid, the producers of this solution have not officially registered it in Moldova (registration implies a cost of approximately 3,000 euro) and even those few producers who use it do so unofficially, not respecting the local legislation.

ii. Physical damages

Improvements needed: When using Gibberellic acid and irrigation there is a high risk of berries cracking resulting in visual defects. In order to prevent this, there is a need to apply calcium to the leaves in conjunction with Gibberellic acid.

Constraints:

One nationwide constraint is the lack of skilled labor in rural areas due to extensive out-migration. Some of the work, like manual thinning or produce handling during harvesting is labor intensive and it can be hard for farms to find all of the workers they need. During harvesting, the boxes shouldn't be overloaded in order not to squash grapes. To improve grape appearance, pickers should be trained to put more focus on careful harvesting, eliminating the spoiled berries.

iii. Demanded varieties

For Moldovan producers it is more profitable to work with early and predominantly late dark varieties that can be stored because the value of these varieties is higher in our traditional markets. Seedless varieties already tested in Moldova show promise as well and will be increasingly important as Regional consumers continue the trend of "Westernizing" their taste preferences.

Constraints: The long period required in order to adopt new varieties (7 years from the date of registration) slows down the process of introducing new promising varieties to the market. The testing area is limited to 5 hectares which means that after 7 years the total output that can be marketed is limited. Another constraint is that seedless varieties already tested have very limited distribution (in nurseries, etc.).

Improvements needed: It would be more efficient if Moldova would adopt the EU variety registration list and the tester could take on the risks associated with planting new varieties by expand the testing area. This is a potential area for a Competitive Impacts of Business Environment Reform (CIBER) analysis. For pre-tested seedless varieties, ACED will work to link those varieties into Moldovan nurseries more broadly.

iv. Packaging

The main requirements for packaging are to be convenient to handlers, clean, that it protects fruits from damages and losses and attractive if the packaging will end up on retail display. In order to be more competitive in delivering fresh table grapes to the market in the winter period Moldovan producers should use a different format of packaging: smaller wooden boxes of 4.5-5 kg with a layer of protective paper.

Constraints: Producers do not know the end market requirements regarding packaging and thus, do not feel the need to move from traditional 8-10 kg wooden boxes or plastic bags. For packaging producers there is no problem in changing equipment for producing new boxes as existing equipment

for adjustable and local box producers can make any standard of boxes. The constraint is in the fragmented demand for boxes of 4.5 kg.

Improvements needed:

Use of individual bags for each bunch would help not lose product weight in cases of varieties for which berries fall easy from the bunch. Use box stacking with corner posts on pallets and fork lifts for loading unloading instead of manual work (box by box) will radically speed up the delivery of product to the pre-cooler or cold storage thus increasing the shelf life. For working with modern retail chains in foreign markets these measures should be implemented entirely.

Currently producers don't use individual bags so the appropriate ones will need to be identified and tested. Forklifts for pallets would need to be procured and likely require access to finance; workers will need to be trained on stacking pallets.

Market requirement #2: Cost Competitiveness

Constraints: As seen above, Moldovan productivity is much lower than in Turkey, one key competitor. One major constraint is that yield per hectare is lower than that of competitors leading to higher variable costs per kilo. Low productivity among growers is determined by two main causes: i) Growers don't know how to increase productivity efficiently; ii) Growers feel they cannot afford the investments needed to enhance productivity (such as irrigation and fertilizers) and have been reluctant to invest in the necessary upgrades.

Improvement needed: Growers have to implement technologies that increase productivity such as: irrigation and foliar fertilizing with micro-elements. This will lead to higher productivity and lower variable costs.

ACED intervention: ACED will train TG producers in efficient technologies to increase productivity. Growers have to be trained in the methods and effects of irrigation and special fertilizers. ACED will link producers to equipment and fertilizer input supply companies. ACED will organize demonstrations where growers will see the difference between the traditional technology they apply and the recommended and more effective technologies.

Market Requirement #3: Produce uniformity, delivery sustainability and longer shelf life

Constraint: Table grapes volumes per grower are small, there is limited coordinated consolidation, quality varies and there is no pre-determined harvest schedules shared with buyers or fellow producers who could sell together.

A big problem faced by Moldovan producers that limits penetration to the modern retail distribution channel is absence of uniform quality of sufficiently large volumes of produce over a long enough window of delivery (for example one 20 ton truck with standard high quality grapes per week for 8 weeks). Another large problem is the lack of cold storage and pre-cooling capacities co-located in the proximity of growers, namely in the southern part of the country. Cold storage management with adequate temperature and humidity regimes is also crucial to maintain produce shelf life. Another constraint is the very fragmented table grape production with many small growers and over diversified varieties, which leads to a long time for produce collection from multiple fields to cold storage (as a truck can spend days going around and collecting the grapes to bring them to cold storage). Producers currently lack knowledge and awareness about the importance of cold chain management, about adequate cold storage practices and about final application of disinfectant solutions while storing such as fumigating or sulfuring with Sulfur Dioxide to kill fungus.

The principle problem preventing consolidation is the lack of trust among producers and unwillingness to change their traditional approach of doing business. Fragmented small producers have different production skills and financial capacities, which by default leads to differing quality of produce.

Improvement needed: A multi-pronged approach is needed to achieve produce uniformity, delivery sustainability and the longer shelf life. First, volumes of high quality grapes will need to be consolidated. The improvements for shelf life include also the adequate application of plant protection solutions in the field and shortening the time of grapes delivery from the field to a pre-cooling facility and cold storage. Stakeholders/ investors will need to build cold storage facilities including forced air pre-cooling machinery in table grapes production regions. For this, it will be necessary to attract investments in post-harvest infrastructure from growers (through marketing cooperatives), traders or outside investors. Consolidation could be achieved by growers joining in production/marketing cooperatives being managed by a leading producer in the region if he/she plays a role of consolidating trader. In the longer term land plots will likely be consolidated (a process which is already underway in Moldova as larger plots make for better economic efficiency).

ACED Intervention: In order to overcome these constraints listed above, ACED will: i) present advantages of working collectively to justify change; ii) identify model producers and traders; iii) build capacity of producer groups to sell a standard quality product; iv) link producers to financing and business service providers who can help provide viable business plans; v) link model producers to loans for packinghouses.

In order to attract investment, feasibility studies and investment plans will be developed that will be disseminated to potential interested investors through MIEPO, MAFI, Chambers of Commerce, embassies, foreign investors' associations and investor forums. Furthermore, through joint efforts between ACED and AAFA growers will be able to access financial resources for cold chain infrastructure and packing houses that will improve Southern grape producers in foreign markets.

Market Requirement #4: Acceptable levels of pesticide residues

Constraint: Currently there is uncertainty whether or not pesticide residue levels comply with local, regional, and EU standards. Both export and local markets put increasing emphasis on the permitted level of pesticide and other chemical residuals in produce. Inability to meet those requirements is potentially dangerous for the whole fresh fruit industry in Moldova including the table grapes production sector.

Improvements needed: Buyers of table grapes need assured compliance of all growers with the minimum level of pesticide residues accepted by local and foreign market regulating bodies according to:

- For EU - http://ec.europa.eu/sanco_pesticides/public/index.cfm;
- for Russia and Belarus – “Постановление Главного государственного санитарного врача РФ от 2 августа 2010 г. N 101, Об утверждении ГН 1.2.2701-10 "Гигиенические нормативы в объектах окружающей среды (перечень)”
- For Moldova- Sanitary Regulation Related to Maximum Admissible Limits of Pesticide Residues, Government Decision 1191 of 23 Dec 2010.

Furthermore, producers need to understand the necessity of adopting the principles of integrated pest management, including the use of disease preventing actions. A common crop protection system leads to lower pesticide costs because of joint procurement and lower cost for crop protection consultancy and better knowledge dissemination.

ACED Intervention: ACED will train growers and conduct workshops on integrated pest management and how to comply with EU and Russia/ Belarusian standards. ACED will assist groups of growers which intend to jointly market their produce in adopting common crop protection systems and implementing quality standards. ACED will work with producer groups in realizing their joint procurement bargaining power (to source inputs jointly for less money than by themselves).

Market Requirement #5: Awareness of and compliance with market requirements

Constraint: Growers are not aware of market requirements. Because of grower fragmentation and lack of long term relations with marketing partners that hold marketing information, limited information about market requirements is currently passed to the grower. Even when the grower does receive some information, the lack of on-going flow often leads to the incorrect interpretation. In general, there is poor visibility of end market requirements and trends. This leads to the situation where Moldovan producers lose their competitiveness in a rapidly changing market environment.

Improvements needed: Value chain participants need to learn periodically what are the main end market requirements, trends, and implications for their business activities. Due to long term marketing relations established among business partners, value chain participants with market information (exporters) should be motivated to identify and pass downstream the necessary market information.

ACED intervention: ACED will develop better marketing capacity within MAGPE. ACED will link growers with buyers in long term supply relationships, ACED will train exporters on how to enhance communications with suppliers in order to maximize the competitiveness of the product they receive, and how to communicate dynamic market information. ACED will support the initiatives of cooperation and strengthening of vertical linkages along the value chain by bringing key players together, providing them training and building trust in the process. Additional flow of information will be established through the Moldovan Association of Grapes Producers and Exporters marketing arm, especially for new markets and new market segments. For this purpose, ACED will assist MAGPE in creating a marketing department that will collect and disseminate the information to its members.

5.2 Action Plan to Implement Upgrading

Market Requirements/ Critical Success Factors	Improvements needed	ACED interventions	Timing	Resources
1. Cosmetic appeal - Berry size min. 20 mm - Bunch weight ~600g <i>2.Lack of physical damages</i> <i>3.Grow early and late dark demanded varieties that can be stored</i> <i>Packaging</i>		1. Identify and select the target groups (approximately 7 clusters) for trainings on table grapes production	- Dec. 01, 2011	- ACED staff
		2. Identify potential trainers from each target groups	- Dec.15, 2011	- ACED staff
		3. Develop content and provide Training of Trainers (ToTs) in methods of berry and bunch enlargement through thinning, fertilizing, irrigating and application of growth regulators (such as using Gibberellic Acid paired with Calcium treatments)	- Jan. 10, 2012	- Local specialist - International STTA - ACED staff
		4. Organize training course for growers from the target groups (including GAP)	- Jan. 15, 2012	- Local specialist
		5. Develop video course in table grape production (based on video of trainings, demo events and study tours)	- Medium term	- Local subcontractor
		6. Organize a study tour to Southern Italy – Puglia region (specialized in table grape production and integrated cold chain management) and/ or Turkey (where integrated value chain post-harvest handling and marketing is more efficient than in Moldova)	- Medium term	- ACED staff
		7. Develop a guide of step by step production technology for the early and late dark table grapes varieties with variety description with focus on upgrading needs identified in the TGVC Analysis	- Medium term	- ACED staff - Local specialist International STTA
		8. Provide and link to Technical Assistance individual VC participants in TG production technology according to requirements identified in EMS and TGVC Analysis	- Medium term	- ACED staff
		9. Consolidate information on the demand for Gibberellic Acid and facilitate its registration and distribution in Moldova - Prepare information on market demand and present it to regional input supplier to motivate them to register their product in Moldova, assist with documents	- Long term	- ACED staff - MAGPE - Regional Input Supplier of G. Acid
		10. Identify location and partner grower and organize demonstration plots in the field of: - Increasing berry and bunch size increase (thinning, Gibberellic Acid, Fertilizing, Irrigation) - Reducing physical damages (harvest and PHH practices, box loading and stacking, Application of Calcium) - Planting most demanded varieties (larger berries and bunches)	- Long term	- ACED staff - MAGPE
		1. Initiate the production and propagation of packaging of 4.5-5 kg made of wood or cardboard to fit Europallet - Aced will provide package producers information about market potential for smaller package - ACED will provide package producers the size of the package - ACED will assist package producers in designing and producing a demo quantity of boxes to be spread among growers during the demo-events	- Medium term	- MAGPE - Packaging producers and assemblers
		2. Initiate the use of protective paper that separates grapes in the box with a model group of producers - Identify best paper to be used - Link paper provider with producers	- Medium term	- MAGPE - Packaging producers and assemblers
		3. Provide training and demonstration of table grapes harvest in boxes with protective paper	- Medium term	- MAGPE - Model growers

				- ACED Staff - Local Specialist
		4. Test and initiate the use of disinfectant SO ₂ pads that is placed on the bottom of each box intended for storing in cold storage (this substitutes the need in gassing the whole chamber with SO ₂ leading to equipment and doors corrosion and faster cold storage amortization)	- Long term	- MAGPE - Model growers
		5. Train, demonstrate and provide sorting table designs on field use of self-made sorting tables (in individual bunch plastic bags)	- Medium term	- MAGPE - Model growers
2. Competitive costs	<i>Higher productivity</i> (higher yields t/ha)	1. Train TG producers in methods for obtaining higher productivity by means of: - Irrigation - Fertilizing with micro elements and foliar application - Create and disseminate crop budget that illustrates the cost benefit analysis of using irrigation	- Medium term	- ACED staff - Specialized companies
		2. Provide growers with the list of equipment and fertilizer providers	- Medium term	- ACED staff
		3. Organize demonstration events for growers, distribute Crop budget demonstrating the cost benefit analysis of using irrigation	- Medium term	- ACED staff - Model growers - Local specialist - BSPs - Input suppliers
3. Produce uniformity and longer shelf life	<i>Consolidated and organized volumes of high quality grapes</i>	Consolidate efforts of smaller producers in applying the same technology and standards through cooperative selling of by:	-Long term	- ACED staff
		1. Organize round tables for discussing and explaining the advantages and synergistic effects resulting from cooperation - Workshop - Table Grapes Forum - Develop a short strategy and business plan for grower groups - Present the strategy at workshop(s) with targeted production clusters		
		2. Develop investment plans for building cold chain infrastructure close to the target groups (table grapes production clusters) in order to shorten the time from field to pre-cooling and cold storage	- Medium term	- ACED staff - IDSPs
		3. Identify financial incentives for groups of producers which want to cooperate and link model producers with lenders and IDSPs for getting access to investments leading to consistent volumes, quality, competitive, varieties and standards - Develop the financing guide with the indication of financial sources, conditions and budgets - Develop generic investment plan referred to an integrated model of table grape production, storage and marketing	- Medium term	- ACED staff - MAGPE - Donors - Investors
		4. Initiate and develop an integrated demonstration model of Table Grapes production, cold chain and marketing as a reliable example of proper way for taking the advantage of market opportunities	- Medium term	- ACED staff
	Longer shelf life (7 – 10 days) - Improve Post-harvest Handling - Adopt precooling - Adopt improved storage technologies	1. Develop and provide trainings to trainers (ToT)s, growers, traders and exporters regarding TG PHH including the video course in TG PHH (edited from video of the trainings, demo events and study tours)	- December, 2011	- ACED staff - International STTA
		2. Create and disseminate the TG Cooling and Storage Guide with focus on findings from TGVC Analysis	- Medium term	- ACED staff - Local specialist
		3. Develop a database of providers of cold chain related equipment, materials and machines	- Medium term	- ACED staff
		4. Identify and organize demonstration events at selected growers with cold storages, in the field of: - Post-harvest Handling - Use of corner posts, pallets and forklifts that fasten handling - Precooling - Cold storage, cold storage disinfection using SO ₂ - Humidifiers	- Medium term	- ACED staff - International STTA - Local specialist - MAGPE - Model growers

4. Accepted level of pest residues	<i>Compliance of all growers with minimum level of pest residues accepted by local and foreign markets regulating bodies</i>	1. Train geographically concentrated clusters in food safety including admissible norms of residues in table grapes according to GOST and EU requirements. Provide information about the threats of not respecting food safety standards	- Medium term	- Food safety specialist (TBD) - ACED staff - MAGPE
		2. Assist target groups and individual growers in implementing national quality standards, GlobalGAP and HACCP	- Long term	- ACED staff - MAGPE
		3. Train and build the capacity of laboratories in identifying the residue content in Moldovan table grapes according to Russian RosPotrebNadzor and EU requirements	- Medium term	- ACED staff - State Phyto-sanitary Inspectorate - MAGPE
		4. Equip and certify central SPS lab.		
5. Awareness about market requirements	<i>Marketing information</i>	1. Organize a workshop with 20 – 30 representative stakeholders of table grapes sector (MAGPE members, MAFI) to present the findings of the ACED End Market Studies and Table Grape Value Chain Analysis <ul style="list-style-type: none"> - Elaborate the list of stakeholders - Invite stakeholders to ACED office - Conduct the workshop 	- November 2011	- ACED staff - MAGPE
			- Oct. 28, 2011	
			- Oct. 31, 2011	
			- Nov. 15. 2011	
		2. Present at Table Grapes Forum the findings of ACED End Market Studies and Table Grape Value Chain Analysis to the main actors along the value chain, i.e. Nurseries, Input suppliers, Growers, Traders and Exporters.	- Dec. 03, 2011	- ACED staff
		3. Update and disseminate the findings of ACED End Market Studies and Table Grape Value Chain Analysis to the table grape value chain stakeholders	- Long term, continuous	- MGPE - ACED staff - Agro-inform - ACSA - MIEPO
		4. Provide capacity building and TA to MAGPE's staff on Marketing	- Medium term	- ACED staff - MAGPE
		5. Organize round tables for presenting the ACED EMSs	- Dec. - Jan., 2011	- FEMIDA - Cahul Grape Producers and Exporters Association (from South)
		6. Enhancing existing or implementing new MIS with information relevant to table grapes <ul style="list-style-type: none"> - Trainings of growers, traders and exporters in using the MIS - Promotion of MIS and information dissemination 	- Medium term, 2012	- ACED staff - Agro-inform - ACSA - FEMIDA
7. Assist individual VC participants by providing marketing knowledge and trade linkages	- Long term	- ACED staff		
8. Carry out additional EMSs in markets of interest (e.g. Estonia)	- Long term	- ACED staff		
9. Disseminate the EMSs among VC participants	- Medium term	- ACED staff		

5.3 Causal Model

Market Requirements/ Critical Success Factors	ACED interventions	Outputs	Outcomes	Impacts
<p>1. Cosmetic appeal</p> <p><i>1. Berry diameter and bunch weight</i></p> <p><i>Berry min. 20 mm</i></p> <p><i>Bunch weight ~600g</i></p> <p><i>2. Lack of physical damages</i></p> <p><i>3. Grow early and late dark demanded varieties that can be stored</i></p>	<ol style="list-style-type: none"> 1. Identify and select target groups (clusters) for trainings on table grapes production 2. Identify international and local STTA 3. Select potential Trainers from the target groups 4. Develop the production course on table grapes for the trainers 5. Provide ToTs regarding methods of berry and bunch enlargement through thinning, fertilizing, irrigating and application of growing regulators 6. Organize training course for growers from the target groups (including GAP) 7. Develop of the video courses on table grapes production 8. Organize a study tour to Southern Italy – Puglia region and/ or Turkey 9. Develop the guide of step by step production technology for the early and late dark table grapes varieties 10. Develop the guide of the Table Grapes variety description with focus on findings from TGVC Analysis including information on dark, late and hearty storable varieties 11. Link individual VC participants to technical assistance and finance in TG production technology according to requirements identified in EMS and TGVC Analysis 12. Assist the registration of Gibberellic Acid in Moldova 13. Identify growers and Organize demonstration activities in: <ul style="list-style-type: none"> - Berry and bunch size increase (thinning, Gibberellic Acid, Fertilizing, Irrigation) - Physical damages (harvest and PHH practices, box loading and stacking, Application of Calcium) - Profitable varieties 	<ul style="list-style-type: none"> ▪ # of target groups identified ▪ # of target groups selected ▪ # of cluster trainers identified ▪ # of ToTs ▪ # of growers trained ▪ # of video courses distributed or viewed online ▪ Study tour held ▪ # of study tour participants# of Production Guides distributed ▪ Variety Description Guide developed ▪ # of Variety Description Guides distributed ▪ # of individual VC participants assisted in TG production technology ▪ # of demonstration events conducted 	<ul style="list-style-type: none"> ▪ Gibberellic Acid is registered in Moldova <p>Together with ToTs, video, demos, study tour and guides contributing to:</p> <ul style="list-style-type: none"> ▪ TGVC participants apply techniques (thinning, irrigation, growth regulators, thinning) to achieve larger bunches ▪ TGVC participants invest in planting new and higher value TG varieties ▪ Growers implement newly acquired production and sorting and packing techniques (use of pallets, fork lift, sorting tables, etc.) ▪ Producers sell TG in better and more convenient to handle packaging <p>Leading to:</p> <ul style="list-style-type: none"> ▪ Producers sell TG produce that has a strong cosmetic appeal and a superior quality, achieving higher sales prices <p>Leading to:</p> <ul style="list-style-type: none"> ▪ Improved image to TG importers of Moldova as a TG exporter country 	<p>TGVC level</p> <ul style="list-style-type: none"> ▪ Production and marketing of higher value table grapes <p>Input supplier level</p> <ul style="list-style-type: none"> ▪ Increased income to input suppliers due to a demand for newly registered Gibberellic Acid ▪ Increased income to early adopters producing 4.5 kg boxes <p>Nursery level</p> <ul style="list-style-type: none"> ▪ Increased income due to sales of additional varieties of early and late dark TG <p>Grower level</p> <ul style="list-style-type: none"> ▪ Increased power of negotiation ▪ Increased profits due to increased value <p>Trader/Exporter level</p> <ul style="list-style-type: none"> ▪ Increased profits by operating with a TG of much better quality and obtaining better prices
<p>4. Packaging</p>	<ol style="list-style-type: none"> 1. Consolidate the demand for smaller packaging of 4.5-5 kg made of wood or cardboard to fit Europallet 2. Initiate the use of protective paper that separates grapes in the box with a model group of producers <ul style="list-style-type: none"> - Identify best paper to be used - Link paper provider with producers 3. Provide training and demonstration of table grapes harvest in boxes with protective paper 4. Test and then train on use of sulfuring SO₂ pads that placed on the bottom of each box intended for storing 5. Train, demonstrate and provide sorting table designs on field use of self-made sorting tables (paired with individual bunch plastic bags) 	<ul style="list-style-type: none"> ▪ # of 4.5 boxes introduced in TGVC use ▪ # of boxes with protective paper ▪ model producers identified ▪ key paper suppliers identified ▪ # of linkages: protective paper suppliers-growers ▪ # of people trained in the use of protective paper ▪ # of demonstration events related to protective paper use ▪ # of sulfuring paper tests conducted ▪ # of people trained in sorting and packaging on a special sorting table ▪ # of sorting tables and packaging demonstrations ▪ # of participants to sorting tables and packaging demonstrations and trainings 	<ul style="list-style-type: none"> ▪ Farmers increase use of 	<p>Increased incomes</p>
<p>2. Competitive</p>	<ol style="list-style-type: none"> 1. Train TG producers in methods for obtaining higher productivity by means of: 	<ul style="list-style-type: none"> ▪ # of productivity trainings 	<ul style="list-style-type: none"> ▪ Farmers increase use of 	<p>Increased incomes</p>

<p>costs</p> <p><i>Higher productivity (higher yields t/ha)</i></p>	<ul style="list-style-type: none"> - Irrigation - Foliar Fertilizing with micro elements <ol style="list-style-type: none"> 2. Provide growers with the list of equipment and fertilizer providers 3. Identify demonstration sites to show growers the effects of the use of irrigation and adequate fertilizers 4. Organize demonstration events for growers 	<ul style="list-style-type: none"> ▪ # of participants in productivity trainings ▪ List of equipment and fertilizer providers distributed ▪ # of demo-sites identified ▪ # of productivity demonstrations ▪ # of participants at productivity demonstrations 	<p>irrigation, foliar fertilizers with micro elements</p> <p>As a result:</p> <ul style="list-style-type: none"> higher yield/ ha achieved ▪ The price for table grapes relative to its value is more competitive ▪ The gross margin in TG production is increased <p>along the main participants of TGVC</p>
<p>3. Produce uniformity and longer shelf life</p> <p><i>1.Consolidated and organized volumes of high quality grapes</i></p>	<p>Consolidate efforts of smaller producers in applying the same technology and standards through cooperative selling of the produce by:</p> <ol style="list-style-type: none"> 1. Organize round tables to discuss and explain the advantages resulting from cooperation <ul style="list-style-type: none"> - Workshop - Table Grapes Forum - Develop a short strategy of creating grower groups - Present the strategy to model at an workshop 2. Develop investment plans for building cold chain infrastructure close to the target groups (table grapes production clusters) in order to shorten the time from field to pre-cooling and cold storage 3. Identify financial incentives to groups of producers which want to cooperate and link model producers with lenders and present investment plans for making investments leading to consistent volumes, quality, competitive, varieties and standards <ul style="list-style-type: none"> - Develop the financing guide with the indication of financial sources, conditions and budgets - Develop generic investment plan for an integrated model of table grapes growing, storing and marketing 4. Initiate and develop an integrated demonstration model of Table Grapes production, cold chain and marketing 	<ul style="list-style-type: none"> ▪ # of producer cooperative marketing round tables ▪ # of workshops ▪ TG Growers' Consolidation strategy ▪ Cold chain investment plan ▪ # of financial incentives identified ▪ Cold chain financing guide ▪ Integrated TG production Investment Plan ▪ # of integrated TG production demonstration models 	<ul style="list-style-type: none"> ▪ Growers realize a need to work together to meet market requirements ▪ Groups of growers coordinate their efforts in making acquisitions, applying production technology, complying to quality standards, PHH, collecting necessary volumes and marketing ▪ Growers achieve uniform quality as a group ▪ Access to supermarket chains with bigger volumes of good quality table grapes ▪ Contracted stable volumes sold at constant prices with fewer risks ▪ Increased profits along the TGVC
<p><i>2.Longer shelf life (7 – 10 days)</i></p> <p><i>Improve Post-harvest Handling</i></p> <p><i>Adopt pre-cooling</i></p> <p><i>Adopt improved storage technologies</i></p>	<ol style="list-style-type: none"> 1. Develop and provide trainings of trainers, growers, traders and exporters regarding TG PHH including a video on TG PHH 2. Elaborate the TG Cooling and Storage Guide with focus on findings from TGVC Analysis 3. Develop a database of providers of cold chain related equipment, materials and machinery 4. Identify and organize demonstration events at selected sites (growers with cold storage), in: <ul style="list-style-type: none"> - Post-harvest Handling - Use of corner posts, pallets and forklifts that speed up handling - Pre-cooling - Cold storage, sulfuring technology, sulfuring pads - Humidifiers 	<ul style="list-style-type: none"> ▪ # of trainers trained ▪ # of video courses on TG PHH distributed ▪ # of growers trained ▪ # of trader and exporter trained ▪ TG Cooling and Storage guide developed ▪ # of TG Cooling and Storage guide distributed ▪ Database of equipment providers developed ▪ # of PHH demonstrations ▪ #of PHH demonstration participants 	<ul style="list-style-type: none"> ▪ TGVC participants understand and apply modern PHH practices ▪ This leads to: ▪ Moldovan TGVC generates a competitive long shelf life product lasting close to 10 days ▪ This higher quality leads to: <ul style="list-style-type: none"> ▪ Strengthened ongoing relations with buyers ▪ Better Market perception ▪ Decreased produce losses along the TGVC ▪ Increased turnover of Moldovan growers at trader/exporter level ▪ Increased profit along the TGVC

		of Moldovan TG
4. Acceptable level of pesticide residues	<ol style="list-style-type: none"> 1. Train target groups in geographically concentrated clusters in food safety including admissible norms of residues in table grapes according to GOST and EU requirements. Provide information about the threats coming from not respecting food safety standards 2. Assist target groups and individual growers in implementing national quality standards, GlobalGAP and HACCP 3. Verify the ability of laboratories in identifying the residue content in Moldovan table grapes according to Russian RosPotrebNadzor and EU requirements 	<ul style="list-style-type: none"> ▪ # of trainings in food safety and pest residue control ▪ # of trained target groups ▪ # of TG growers assisted in implementing national quality standards, GlobalGAP and HACCP ▪ # of growers certified ▪ # of laboratories verified ▪ Report on laboratory capacity to verify pesticide residues <ul style="list-style-type: none"> ▪ TGVC participants are aware of pesticide residue requirements in local and foreign markets ▪ Growers know the risks they can expose consumers if not respecting minimal levels of pesticide residue requirements ▪ Laboratories residue verification capacity is improved as required by local and foreign markets <ul style="list-style-type: none"> ▪ Improved Moldovan TGVC image in end markets ▪ High quality and competitive TG produce ▪ Decreased value of unofficial payments ▪ Consumers are healthier as pesticide generated diseases are reduced
<i>Compliance of all growers with minimum level of pesticide residues accepted by local and foreign markets regulating bodies</i>		
5. Marketing information	<ol style="list-style-type: none"> 1. Organize a workshop with 20 – 30 representative stakeholders of table grapes sector (MAGPE members, MAFI) to present findings of ACED End Market Studies and Table Grape Value Chain Analysis 2. Present at Table Grapes Forum the findings of ACED End Market Studies and Table Grape Value Chain Analysis to the main actors along the value chain, i.e. Nurseries, Input suppliers, Growers, Traders and Exporters 3. Disseminate the findings of ACED End Market Studies and Table Grape Value Chain Analysis to the representative members of the Moldovan Association of Grapes Producers and Exporters (website, in person, etc.) 4. Build capacity of MAGPE marketing arm to monitor and analyze market trends 5. Assist individual VC participants by providing marketing knowledge and trade linkages 	<ul style="list-style-type: none"> ▪ TG Workshop ▪ 20-30 participants ▪ 2 presentations ▪ Participation at TG Forum ▪ 2 presentations ▪ # of materials disseminated related to EMSs and TGVC Analysis ▪ MAGPE marketing function operational, transmitting market information to growers ▪ # of VC participants assisted <ul style="list-style-type: none"> ▪ TG growers understand the need for compliance with higher value market requirements ▪ TGVC participants have a broad access to valuable market information and know how to use it, understand that markets are dynamic and make business adjustments as needed over time <ul style="list-style-type: none"> ▪ TGVC level ▪ Better positioning in the end markets and an increased end market share ▪ Nursery level ▪ Increased income due to better knowledge of TG varieties demanded in the end markets ▪ Grower level ▪ Increased value of TG produce due to complying with market requirements (varieties, packaging, uniformity) ▪ Trader/Exporter level ▪ Increased profits by operating with a TG of better quality and obtaining better prices for it

Chapter VI Annexes

Annex 1 Table Grapes Varieties and Maturation Periods

		Table Grapes	Periods of Harvest									
			July	August			September			October		
			3	1	2	3	1	2	3	1	2	
1	SD	Augustovski										
2	SD	Jemciug Csaba										
3	SL	Loose Perlette (Jemciujenca)										
4	SD	Muscat Iantarnii										
5	SD	Muscat Jemciujnai										
6	SD	Vostorg										
7	SD	Super Extra										
8	SD	Margăritar										
9	SD	Muscat Timpuriu										
10	SD	Prezentabil										
11	SD	Regina Viilor										
12	SD	Startovii										
13	SD	Arcadia										
14	SD	Favorit										
15	SD	Matilde										
16	SD	Victoria românească										
17	SD	Irşai Oliver										
18	SD	Frumoasa albă										
19	SD	Lora										
20	SL	Apiren alb										
21	SD	Chasselas d'ore										
22	SD	Chasselas musque										
23	SL	Romulus										
24	SD	Novii Podaroc Zaporozju										
25	SD	Podaroc Zaporozjuu										
26	SD	Talisman										
27	SL	Thompson Seedless (Sultaninã)										
28	SD	Leana										
29	SD	Alb de Suruceni										
30	SD	Ialovenskkii ustoicivii										
31	SD	Guzun										
32	SD	Karaburnu										
33	SD	Italia										
1	SD	Cardinal										
2	SL	Ruby Seedless (Rubinovii Bessemianii)										
3	SD	Victoria rusească										
4	SL	Kişmiş lucistâi										
5	SL	Mecita										
6	SD	Dunav										
7	SD	Chasselas rose										
8	SL	Apiren roz										
9	SD	Original										
10	SL	Kişmiş moldovenesc										
11	SD	Iubilei Juravelea										
12	SD	Red Globe (Crasnii Şar)										
1	SD	Codreanca										
2	SD	Rannii Magaracea										
3	SL	Beauty Seedless (Crasavita Bessemiana)										
4	SL	Monukka (Monica)										
5	SD	Pameati Negrulea										
6	SD	Black Rose (Ciornaia Roza)										
7	SL	Apiren negru de Grozeşti										
8	SD	Muscat de Bugeac										
9	SD	Odesskii Suvenir										
10	SD	Coarnă neagră										
11	SD	Muscat de Hamburg										
12	SD	Alphonse Lavallee										
13	SD	Moldova										
14	SD	Osenii Ciornii										
	SD	Seeded										
	SL	Seedless										

Light colored cells - Registered varieties
Dark colored cells - Varieties for testing, pending registration

Source: Product of present research

Annex 2 List of Moldovan Table Grapes Exporters

	Company name	Address
Members of Moldovan Association of Grapes Producers and Exporters		
1	PODGORENI LTD	Lingura village, Cantemir raion
2	FRUCT-EXPORT-INTER Company	7/A, Stefan cel Mare str., Popeasca village, Stefan Voda raion
3	TRANS-ORIGINAL-PRODUCT Company	Popeasca village, Stefan Voda raion
4	CETERONIS-ST LTD	Cantemir town
5	ANDRIDOR GRUP LTD	Tintareni village, Anenii Noi raion
6	CAPITALAGRO-STIL LTD	Sv. Nicolae str., Costesti village, Ialoveni raion
7	DELACOS GRUP LTD	Costesti village, Ialoveni raion
8	GENUM LTD	10, Bucuresti str., Chisinau city
9	TUDORINEX LTD	Chisinau city
10	OSUN-GRUP LTD	Hincesti town
11	ISI-EXIM LTD	204e, Lenin str., Comrat raion
OTHER companies		
12	SEBAX SOFT LTD	Vorniceni village, Straseni raion
13	ANDE-TRANS LTD	108, Hincu Mihalcea str., Hincesti town
14	MARVAS-GRUP LTD	Hodarcauti village, Ocnita raion
15	EXFRUCTTRANS LTD	Malaiesti village, Orhei raion
15	MELICATOS LTD	204, Alba lulia str., 12 ap., Chisinau city
16	UNIVERSAL LOGISTIC LTD	27, Izvoarelor str., Costesti village, Ialoveni raion
17	VIZUS-PRIM LTD	9, Renasterii str., 50 ap., Chisinau city
18	RUSFRUCT LTD	Colicauti village, Briceni raion
19	SOLOTRANS-AGRO LTD	2, Pruncului str., Vatra village, Chisinau municipality
20	NARZAN JSC	42, Rascova str., Riscani town
21	IONEX TRANS LTD	Costesti village, Ialoveni raion
22	TAIX-PRIM LTD	184, Alba lulia str., 17 ap., Chisinau city
23	L.G.V.D.-AGRO LTD	Negrasti village, Straseni raion
24	TRITAL-NORD LTD	202, 50 ani Pobedi str., Ocnita town
25	EUROVECTOR LTD	Sirauti village, Briceni raion
26	ALFA-NISTRU JSC	131, Stefan cel Mare str., Soroca town
27	PRODCAR LTD	Negureni village, Telenesti raion
28	VITALIFRUCT-EXPO LTD	Chistelnita village, Telenesti raion
29	VLAGRIAL-FRUCT LTD	Malaiesti village, Orhei raion
30	GEURCOM LTD	21, Igor Vieru str., Edinet raion
31	SOLIVADA LTD	61, Bulgara str., 15 ap., Balti town
32	SAM-AGROREX LTD	3, Uzinelor str., 2 ap., Otaci town, Ocnita raion
33	SORSERV-PRIM LTD	Trinca village, Edinet raion
34	EXIMFRUCT LTD	Colicauti village, Briceni raion
35	GHEARTCAR-TRANS LTD	15, Bucovinei str., 37 ap., Edinet town
36	GOTIX FRUCT LTD	79, Camarova str., Edinet town
37	CĂLDARE TIMOFEI VASILE FF	Mindresti village, Teleneti raion
38	SORSERV-PRIM LTD	Trinca village, Edinet raion
39	GHEORGHE-BOTNARU Individual Enterprise	Lozova village, Straseni raion
40	URSEVCOM LTD	105, Florar str., 15 ap., Edinet town
41	SOLGON-I LTD	21a, Polanicikin str., Causeni town
42	NICOLCOM GRUP LTD	54, Muncesti str., 66 ap., Chisinau city
43	GOSVICCOM-AGRO LTD	22, Industriala str., Hincesti town

Source: www.fsvps.ru

Annex 3 Moldovan Wood Box Producers

	Company name	Address
1	Trans-Palet Ltd	Mascauti village, Criuleni raion
2	Mob-Décor Ltd	Balti town
3	Viravi-Impex Ltd	Chisinau city
4	Sanplast Group Ltd	Chisinau city
5	Protopacofarm Ltd	99, Decebal blvd, Chisinau city
6	Zerghes Ltd	8, E. Alistar str., Chisinau city
7	Ambalaj-Bulboaca JSC	24, Cucorilor str., Bulboaca village, Anenii Noi
8	Ghermes-Agroservice JSC	74, Stefan Neaga str., of. 4, Chisinau city
9	Lozovanu Grup Ltd	97, Stefan cel Mare str., Lozova village, Straseni raion
10	Capicons Ltd	29, Ioana Radu str., Chisinau city
11	CPL Fag JSC	623, Muncesti str., Chisinau city
12	Lucretia Sandu Individual Company	Orac village, Leova raion
13	Serghei Doganic Individual Company	4, A. Mateevici str., Ghidighici village, Chisinau city

Annex 4 List of Laboratories

List of laboratories accredited / authorized for issuing safety certificates and test protocols for export of fruits and vegetables from Moldova to the Russian Federation

	Denumirea	Numărul de înregistrare	Adresa
1	Centrul de încercări de laborator al Centrului Național de Sănătate Publică	SNA MD CAECP LÎ 01 078 Acr. iniț. 16.08.1999 17.02.2010 – 16.02.2014 SM SR EN ISO/CEI 17025:2006	MD 2028, mun. Chișinău str. Gh. Asachi, 67a Pantea Valeriu tel.: 57-45-73, 57-45-78, 57-45-33 bacteriologie: 57-45-21, 57-45-23 fax: 72-97-25 e-mail: pantea@cnsnp.md
2	LÎ al Centrului de Sănătate Publică, Raionul Ceadâr – Lunga	SNA MD CAECP LÎ 01 052 Acr. iniț. 13.06.1997 20.10.2008-20.10.2012 Competență tehnică și independență SM SR EN ISO/CEI 17025:2006	or. Ceadâr – Lunga str. Micurin, 2/3 MD 6104, Bazilevscaia Valentina tel:/fax:(291) 2-39-82,2-39-89 e-mail: cmp@mtc-cg.md
3	Centrul de Încercări de laborator al Centrului de Sănătate Publică din Municipiul Chișinău	SNA MD CAECP LÎ 01 197 Acr. iniț.08.11.2007 30.11.2010-29.11.2014 SM SR EN ISO/CEI 17025:2006	MD 2001, or. Chișinău str. Hajdeu, 49 Nicolai Furtună tel: 57-43-00, 57-43-88 fax: 57-43-00, 57-43-02 e-mail:cmp@cmpchisinau.md
4	LÎ a produselor alimentare CSM Bălți	SNA MD CAECP LÎ 01 005 Acr. iniț. 06.07.1994 24.09.2010-23.09.2014 SM SR EN ISO/CEI 17025:2006	MD 3100, mun. Bălți str. Decebal 13 Boincean Maria tel:(231) 2-01-54, 2-61-24 fax: :(231) 2-51-41 e-mail: csm-bl@mtc-bl.md e-mail: csmb@mail.ru
5	LÎ al Centrului de Standardizare și Experimentare a Calității Producției de Conserve	SNA MD CAECP LÎ 01 011 Acr. iniț. 19.08.1994 24.11.2008-24.11.2012 Competență tehnică	MD 2023, mun. Chișinău str. Uzinelor, 19 Berezina Ludmila tel:47-13-70 fax:47-71-93

	Denumirea	Numărul de înregistrare	Adresa
		și independență SM SR EN ISO/CEI 17025:2006	
6	LÎ „Agrochim” al Centrului Republican de Pedologie Aplicată	SNA MD CAECP LÎ 01 034 Acr. iniț. 15.12.1995 16.10.2009-16.10.2013 Competență tehnică și independență SM SR EN ISO/CEI 17025:2006	MD 2005, mun. Chișinău str. Cosmonauților, 6 Cociu Ludmila tel:24-30-66, 24-34-04 fax:22-10

Annex 5 List of Key Informants

#	Person interviewed	Company name	Position
1	Vasile Biesu	Moldovan Association of Grape Producers and Exporters	Director
2	Valeriu Cebotari	Market policy in wine and grapes sector, Ministry of Agriculture and Food Industry of Moldova	Chief of Department
3	Gheorghe Savin	Institute of Applied Science in Horticulture and Agri-food Technology	Researcher
4	Cazac Tudor	Institute of Applied Science in Horticulture and Agri-food Technology	Researcher
5	Gheoghe Nicolaescu	Viticulture department, State Agrarian University of Moldova	Researcher/ Professor
6	Andrei Stirbu	Viticulture department, State Agrarian University of Moldova	Researcher/ Teacher
7	Alexandru Cerepenco	Razmost LTD	Grower
8	Dumitru Mihov	Terra-vitis LTD	Grower
9	Ion Chilianu	Codru ST Ltd	Grower
10	Vladimir Sirbu	Vladimir Sarbu Family Farm	Grower
11	Valeriu Mironescu	Famit Com Ltd	Grower
12	Constantin Talmaci	Fructex-COM LTD	Trader, exporter
13	Gheorghe Gaberi	Vitis-Cojusna LTD	Nursery Manager
14	Emil Rotaru	Duoagro Proiect	Plantation designer
15	Iurie Cătană	Elit-Tehnica LTD	Input supplier, fertilizers and agriculture machinery
16	Dumitru Gaidarfi	Ampelos LTD	Input supplier, support system, planting material, agriculture machinery
17	Iurie Bivol	Universal Logistic Ltd	Trader, exporter
18	Mihai Zagorodnyi	Eco Lux Ltd	Supplier of cold storage equipment

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4. "Demand Assessment for Stone Fruit and Table Grape Pre-cooling Services in the South of Moldova", USAID/ACED, August 2011
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8. "Moldova Table Grapes Production Appraisal", USAID/ADP, August 2009
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13. "Russian Retail Chains vs. Foreign Retailers: Changes within the Industry and Supplier-Retailer Relationships" Olga Tretyak, Moscow State University, Faculty of Economics; Marina Sheresheva, Moscow State University, Faculty of Economics
14. "Russian Market for Table Grapes" study, Magenta Consulting, November 2008
15. "The establishment of vine plantations of table grape varieties" information guide, USAID/ADP, 2006
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