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Israeli Production and Export Potential for fruits and vegetables: Expert Panel Analysis using the Delphi technique

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
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1) Overview of fresh fruit and vegetables in Israel

We begin with a brief description of the current state of Israel's agricultural. Table 1 presents data on agricultural production in 2004, with changes from 2003 reported in Table 1a (quantities) and Table 1b (prices).

Table 1: Agricultural output values by purpose and shares of export and domestic shares during 2004

	Intermediate produce and other	For export	For local manufacturing	For local consumption	Total
	NIS millions, at current prices(3)				
TOTAL	9.5%	23.4%	30.5%	36.6%	17509.7
CROPS	9.7%	38.0%	7.1%	45.2%	10572.5
Field crops	40.3%	26.9%	16.8%	16.0%	1181.2
Vegetables, potatoes and melons	1.1%	31.3%	5.7%	61.9%	4312.8
Citrus	3.1%	50.2%	11.5%	35.3%	715.1
Plantations, excluding citrus	12.2%	22.4%	9.3%	56.2%	2348.9
Flowers and garden plants		76.0%		24.0%	1408.7
Other crops	32.5%	65.2%	1.6%	0.8%	605.8
LIVESTOCK & ANIMAL PRODUCTS	9.1%	1.2%	66.2%	23.5%	6937.2
Poultry	16.6%	1.0%	63.8%	18.5%	3113.8
Cattle	1.6%		91.0%	7.5%	2580
Sheep and goats	2.1%		22.8%	75.1%	510.7
Fish		10.7%		89.3%	438.8
Pigs	20.4%	2.4%	47.8%	29.4%	293.8

Source: Processed by authors from Israel's Central Bureau of Statistics (CBS) 2005
http://www.cbs.gov.il/haklaut/hakheb.htm

We see that the crop sectors as a whole export 38% of output value while the livestock sectors export only 1.2%. The most export-oriented sector is the flowers industry that obtains 76% of its revenues from exports, followed by citrus, vegetables and fruits (orchards). The citrus sector has been reduced dramatically since it heyday during the 1960s and is now only ninth in size.

Table 1a compares production between 2004 and 2003. Fruits production (orchards not including citrus) grew at the highest rate (15.7%), vegetables production increased somewhat

above average, while citrus continues to decline. Flowers production grew by more than 37%, but this increase was offset by a decline in prices (Table 1b).

Table 1a: Percent changes in output between 2004 and 2003

	Intermediate produce and other	For export	For local manufacturing	For local consumption	Total
TOTAL	9.6	31.1	2.6	4.7	9.3
CROPS	14.1	31.7	8.0	4.4	13.6
Field crops	7.5	22.7	-12.0	-3.4	5.0
Vegetables, potatoes and melons	64.1	38.3	10.0	1.6	9.9
Citrus	10.4	15.4	-22.4	0.8	-1.0
Orchards, excluding citrus	35.0	18.8	52.1	8.7	15.7
Flowers and garden plants	-	44.6	-	13.8	37.4
LIVESTOCK & ANIMAL PRODUCTS	2.3	9.3	1.7	5.7	2.7
Poultry	2.8	-9.6	1.3	11.3	3.1
Cattle	0.0	-	1.7	3.1	1.8
Sheep and goats	0.0	-	3.2	2.0	2.2
Fish	-	5.3	-	4.3	4.4

Table 1b: Percent changes in output price between 2004 and 2003

	Intermediate produce and other	For export	For local manufacturing	For local consumption	Total
TOTAL	-2.8	-1.2	4.5	-4.6	-0.6
CROPS	-5.6	-1.2	-6.5	-7.3	-4.3
Field crops	4.5	-3.9	-1.8	2.4	1.0
Vegetables, potatoes and melons	27.0	29.5	-3.7	1.5	8.6
Citrus	4.2	7.1	-0.9	-0.3	8.3
Plantations, excluding citrus	-18.1	-6.2	-15.1	-24.4	-18.9
Flowers and garden plants	-	-23.9	-	1.2	-19.1
LIVESTOCK & ANIMAL PRODUCTS	2.3	-1.9	6.5	5.7	5.5
Poultry	1.8	4.5	5.3	11.3	5.6
Cattle	14.5	-	8.9	15.4	9.5
Sheep and goats	1.2	-	4.0	2.1	2.5
Fish	-	11.6	-	-3.8	-2.4

Vegetables production increased by 9.9% and their price increased by 8.6%. Milk (cattle) and poultry prices (controlled by the government) were raised in order to compensate farmers for the raise in input costs.

Table 1c presents import and export indexes for the 5 year period 2000-2004.

Table 1c: Import and export

Israel	Year				
Agriculture Products Total	2000	2001	2002	2003	2004
Import Value (Index)	99	101	102	108	130
Import Unit Value (Index)	99	101	97	105	108
Import Quantity (Index)	100	100	105	102	121
Export Value (Index)	100	94	85	102	133
Export Unit Value (Index)	101	106	93	85	89
Export Quantity (Index)	98	88	91	120	150

Source: FAOSTAT

During this period the magnitude of change in the volume of import and export is almost identical. During the last five years total value of agricultural import increased more than the value of exported, as Israel's agricultural has been loosing its competitive edge in some product categories. We continue with an overview of the vegetables and fruits sectors.

1.1. Vegetables

Vegetables output has increased quite significantly between 2002 and 2005 (with a 5% increase between 2004 and 2005). This is mostly due to growing demand for export (see Table 2) associated with the growing healthier food awareness.

The production of potatoes and melons increased over time, but for different reasons. Potatoes are grown in the Negev (the southern, arid part of Israel) where land is abundant (so its alternative price is low), the desert climate enables out of season production, and the new potatoes varieties are not water intensive. These new varieties are of high demand in Europe, particularly in France and the UK. Most importantly, the previously uncultivated areas in the Negev allow for organic production. The combination of new varieties, low water

consumption, technology oriented production, virgin land suitable for organic products, and favorable climatic conditions all act to support a successful crop.

Melons, grown mainly in the Arava valley, located at the south most tip of the Negev, where on high demand during the 1980‘s but lost their glimmer recently for a variety of reasons. Tomatoes and peppers are grown all over the country, but a large share of the export of these crops is grown in the Arava valley. Table 2 depicts the production by purpose in 2004

Table 2 Vegetable production data - 2004

	Intermediate produce and other	For export	For local manufacturing	For local consumption	Total
	NIS millions, at current prices(3)				
TOTAL – Agricultural sector	1,659.0	4,101.0	5,341.7	6,408.0	17,509.7
Vegetables, potatoes and melons	49.4	1,348.4	243.7	2,671.3	4,312.8
	Percent of quantitative change in relation to previous year				
TOTAL Agricultural sector	9.6	31.1	2.6	4.7	9.3
Vegetables, potatoes and melons	64.1	38.3	10.0	1.6	9.9
	Percent of price change in relation to previous year				
TOTAL Agricultural sector	-2.8	-1.2	4.5	-4.6	-0.6
Vegetables, potatoes and melons	27.0	29.5	-3.7	1.5	8.6

Comparing the second line (vegetables) to the first line (total agriculture revenue) indicates that the share of export is larger in the vegetable group relative to the agricultural sector as a whole and the share of vegetables for industrial processing is smaller. Comparing the fourth and the third lines shows that the production of vegetables increased by 9.9% during 2004 – above 9.3% growth rate of agricultural sector as a whole. The largest increase is in vegetables for intermediate produce and for local manufacturing. In contrast (or perhaps as a result) the average vegetables price has declined.

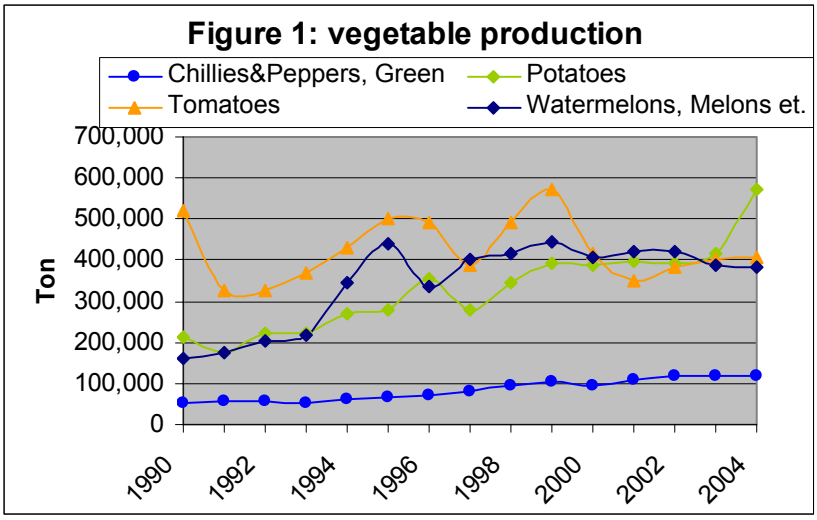
Table 2.1: Area, yield and production for selected vegetables

		Year					
Vegetables Melon, Total		2000	2001	2002	2003	2004	2005
	Area Harv (Ha)	49,831	48,755	52,615	53,715	52,925	52,925
	Yield (Hg/Ha)	322,420	320,128	317,018	309,261	315,521	315,521
	Production (Mt)	1,606,651	1,560,782	1,667,990	1,661,195	1,669,895	1,669,895
Tomatoes	Area Harv (Ha)	4,934	4,170	2,820	3,300	3,400	3,400
	Yield (Hg/Ha)	841,508	835,971	1,366,312	1,215,152	1,191,177	1,191,177
	Production (Mt)	415,200	348,600	385,300	401,000	405,000	405,000
Chillily and Peppers	Area Harv (Ha)	2,115	2,290	2,300	2,300	2,300	2,300
	Yield (Hg/Ha)	449,173	471,616	506,087	511,739	513,043	513,043
	Production (Mt)	95,000	108,000	116,400	117,700	118,000	118,000
Strawberries	Area Harv (Ha)	392	400	400	400	400	400
	Yield (Hg/Ha)	392,857	415,000	410,000	412,500	400,000	400,000
	Production (Mt)	15,400	16,600	16,400	16,500	16,000	16,000
Potatoes	Area Harv (Ha)	11,287	11,400	12,000	12,000	16,000	16,000
	Yield (Hg/Ha)	344,348	347,647	327,584	346,780	356,736	343,750
	Production (Mt)	388,665	396,318	393,101	416,136	570,777	550,000

Source: FAO 2005.

The total area used for agricultural production increased during the last five year. The area used for growing peppers, potatoes and tomatoes increased modestly in the last five years and in the last three years it was pretty much stable.

Figure 1 depicts changes in vegetable production between 1990 and 2004.



Trade with the Palestinian authority

During 2004, 78000 tones of vegetables were purchased from and 28000 tones were sold to the Palestinian authority. Palestinians export to Israel tomatoes and cucumbers and import corn, potatoes and onion. The trade with the Palestinian authority is tax exempt but the vegetables need to pass health inspection.. The quantities imported to Israel affect local prices but since the crops are not in export quality they have no effect on our study.

1.2. Fruits

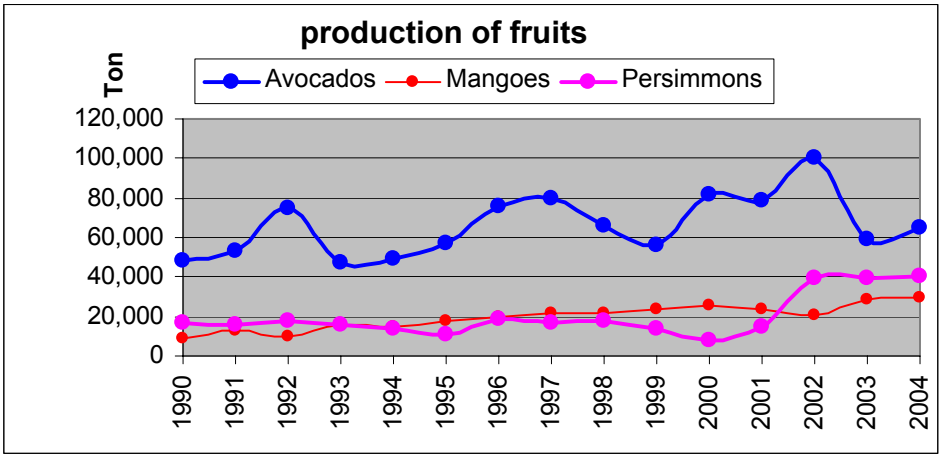
While area of fruits orchards has hardly changed between 1990 and 2004 , output dropped by 41%. However, production of fruits excluding citrus actually recovered between 2002 and 2004. Table 3 illustrates these trends.

Table 3

	Intermediate produce and other	For export	For local manufacturing	For local consumption	Total
	NIS millions, at current prices(3)				
TOTAL Agricultural Productions	1,659.0	4,101.0	5,341.7	6,408.0	17,509.7
Citrus	22.0	358.7	82.0	252.5	715.1
Plantations, excluding citrus	285.4	525.3	218.1	1,320.1	2,348.9
	Percent of quantitative change in relation to previous year				
TOTAL Agricultural Productions	9.6	31.1	2.6	4.7	9.3
Citrus	10.4	15.4	-22.4	0.8	-1.0
Plantations, excluding citrus	35.0	18.8	52.1	8.7	15.7
TOTAL Agricultural Productions	Percent of price change in relation to previous year				
Citrus	4.2	7.1	-0.9	-0.3	8.3
Plantations, excluding citrus	-18.1	-6.2	-15.1	-24.4	-18.9

The share of fruits export increased. Production of the avocados and persimmons alternate between abundance years and shortage years. The difference between high and low production years is about 50% (20000-22000 tons). Persimmons production reveals similar cyclical behavior. Figure 3 depicts the trends of production of the three leading fruit categories: Avocado, Mangoes and Persimmons.

Figure 2: Production of Avocado, Mangoes and Persimmons.



Planting of new almonds, avocados and pomegranates orchards continued during 2005, as Table 4 shows.

Table 4 : New orchards 2003-2005.

2005	2004	2003	Year
17,600	18,800	18,000	New Plantation
5,900	5,000	2,450	Citrus
2,450	1,430	1,050	Almonds
2,150	1,450	3,400	Grapes
1,850	2,250	2,160	Avocado
1,450	1,500	1,200	Olive –industrial
1,000	900	600	Pomegranates
900	2,250	2,090	Peaches
620	1,200	2,000	Pears

Source: CBS special report 8/2/06

Table (5) Presents area, yield and production for the grapes and for the entire vegetables category.

		Year					
		2000	2001	2002	2003	2004	2005
Fruit excl Melons							
Total	Area Harv (Ha)	70,276	63,780	65,880	68,095	69,205	69,205
	Yield (Hg/Ha)	178,328	203,645	181,808	168,926	169,251	169,829
	Production (Mt)	1,253,216	1,298,846	1,197,750	1,150,300	1,171,300	1,175,300
Grapes	Area Harv (Ha)	7,090	7,510	6,000	6,000	6,000	6,000
	Yield (Hg/Ha)	143,635	162,051	190,000	150,167	158,333	158,333
	Production (Mt)	101,837	121,700	114,000	90,100	95,000	95,000

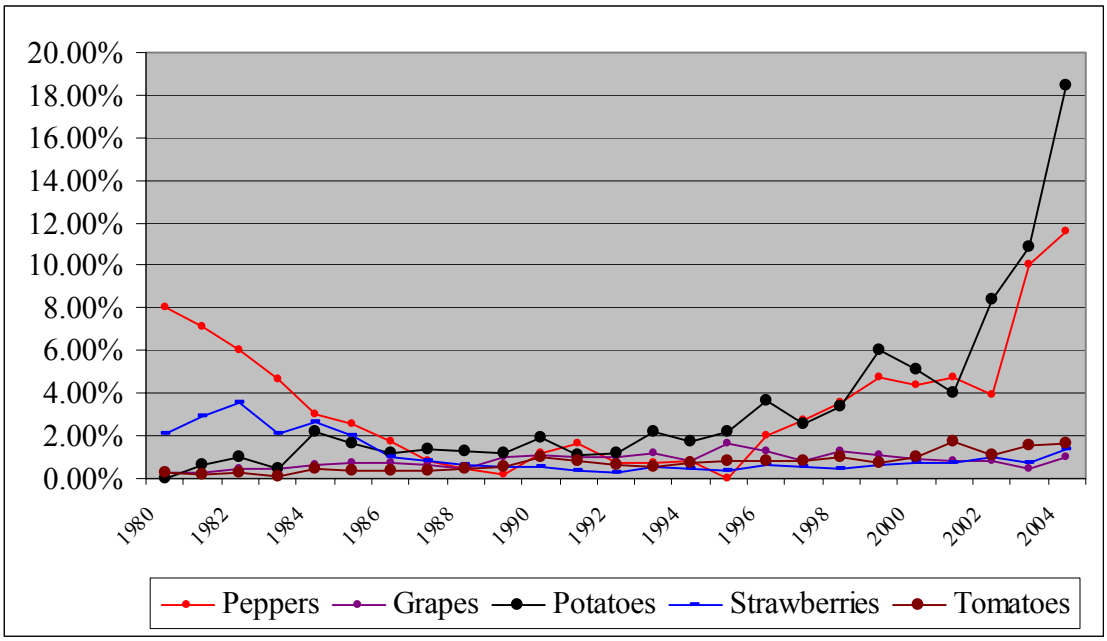
The area used for production of grapes, and the production of grapes declined over the last five years

Source: Israel's CBS, 2005.

1.3. Choice of products

The five products selected for the Expert Panel study are tomatoes, potatoes, pepper, table grapes, and strawberries. (We note that given their weights in the Israeli exports, both avocado and flowers are more important than strawberries and grapes.) Figure 3 presents the market share of the Israeli export to the EU for the chosen products.

Figure (3) – presents the share of export of the five products to the EU



Products with small market share are unlikely to affect local (EU) prices. Only in tomatoes and potatoes markets Israel's exports have significant shares in the EU (above 8%). In peppers, grapes and strawberries, Israel is virtually a price taker.

2) Liberalization scenarios

The liberalization scenarios considered in this project, according to which the Delphi questionnaires were prepared, are summarized below.

Liberalization scenarios - Israel - Year 2015

Product	Current situation	Eu-med partial liberalization scenario
Tomatoes CN8:070200	MFN trigger price Quota (2004) : 10 000 tons Tariff ad valorem : 0% inside the quota *Import UE (2004) : 15 333 tons*	Increase the quota to 20 000 tons
Sweet pepper CN8 : 07096010	Quota (2004) : 15 725 tons Quota (2007) : 17 248 tons Reduced Tariff ad valorem (0,45%) inside the quota *Import UE (2004) : 40 929 tons*	Increase the quota to 61 000 tons
Potatoes CN8 : 07019050 (News, from 01 January to 30 June	Quota (2004) : 31 000 tons Tariff ad valorem : 0% inside the quota Periode : 01 January to 31 March and 1May to 30 June *Import UE : 224 156 tons*	Israel exports are 723% above the volume of quotas Increase the quota to 224 000 tons
Strawberries CN8: 08101000	Quota (2004-2005) : 2 678 tons Tariff ad valorem : 0% inside the quota Period : 01 November to 31 May *Import UE : 3 001 tons*	Increase the quota to 5 000 tons with no change in the windows
Grapes CN10 :0806101099	Tariff ad valorem =0% Period : 1er May to 21 July	Increase the import windows from 1er Mat to 21 August

Sample description

We chose responders who could give reliable valuation based on experience, e.g., mangers of export firms, policy makers in the Ministry of Agriculture and extension service members. (The Israeli extension service is a subdivision of the Ministry of Agriculture and, although talks of privatization surface every now and then, up to now it has been providing free and valuable information to farmers on a broad range of issue from plating, irrigation, pesticide use as well as processing and marketing. In addition to their role in providing technical assistance, the extension experts take active part in designing and carrying out agricultural policies.)

We identified 35 potential responders and (after convincing their mangers to authorize their participation in the study) sent them the questionnaire by mail and email. We received 29 responses (5 replied that they are not knowledgeable enough to handle this mission and 1 declined). Since responders were instructed to answer only questions in their field of expertise and the number of experts is not the same across all product categories, we obtained uneven number of responses for the different categories.

After receiving the first-round questionnaires and processing the information, we sent a revised questionnaire that contained descriptive statistics (mean, standard deviation, maximum and minimum values). The responders were informed that they may revise their initial evaluation, but if they are confident in their initial evaluation then they should stick to it (for Israelis this goes without saying). Only four responders out of 29 revised their initial evaluations.

We presented the results at a conference held in the Ministry of Agriculture to audience of policy makers, extension service administrators and 10 of the experts participated in this study. At the end of the presentation we urged the audience to comment on the evaluations and give their own independent guesses. Overall, the presented figures were accepted.

4) The expert opinion survey: First round questionnaire

Explanation to respondents: We are part of a study funded by the European Union (EU) to estimate the effects of different EU liberalization scenarios on the exports to the EU of horticulture products from the following Mediterranean countries: Turkey, Tunisia, Morocco, Egypt and Israel. This part of the study aims at evaluating the impact of partial and full liberalization on the trade between EU and the above mentioned Mediterranean countries. In addition to other techniques, the liberalization is being studied using the Delphi survey technique.

The Delphi survey technique uses a panel of experts to forecast impacts of various policy measures. The method is straightforward. In the first step we kindly ask you to answer the following questionnaire. The second step will be held shortly after that, and will include another round of questions. There are no right or wrong answers, and your valuation or educated estimate is exactly what we need in order to conduct our forecast. You were selected as an expert in your field and your participation is very valuable for us. We appreciated your time in helping us help the industry.

Thank you,

General guidelines – please answer all the following questions. If you do not have precise information on a specific industry, you can provide your own estimates. If you cannot provide an evaluation or estimate for a particular question, please indicate so.

Tomatoes, cherry tomatoes and other tomatoes.

1) The production of tomatoes in 2003 in Israel was 378000 tones. In 2004 it was 496000 tones. What will be the potential of the production of tomatoes, cherry tomatoes and other tomatoes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

2) The EU quota in 2004 was 10000 tons. Import tax inside the quota is 0% and above the quota an import tax of 8.8%-14.4% is applied (the higher tax is applied in the summer). In 2004 the export was of 15333 tons. Suppose that under a partial liberalization scenario the quota increases to 20000 tons. All other barriers are held constant. What do you think will be the impact of this step on the export of tomatoes, cherry tomatoes and other tomatoes?

3) The quantity exported to the EU will increase to _____
The FOB price, which was on average in 1700 EURO per ton will change as a result of changes in quantity in 2008 to _____

4) Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of tomatoes, cherry tomatoes and other tomatoes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

5) What will be the impact of reduction of all the import barriers between the EU and all the Mediterranean countries that are part of the project on the Israeli export? The quantity will change to _____ the price will change to _____.
What is more restricting the export of tomatoes and cherry tomatoes (please rank): Quota, window of export, MFN price, the Tariff?

Sweet Pepper

1) The production of sweet pepper in 2003 was 94000 tones. In 2004 it was 112000 tones. What will be the potential of the production of sweet pepper in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

2) The quota in 2004 was 15700 tons. In 2007 as part of the WTO agreements the quota will increase to 17248 tons. In 2004 the export was 40929 tons. Suppose that under a partial liberalization scenario the quota will increases to 61000 tons. The ad valorem tariff in the quota will decrease from 0.9% to 0.45% and above the quota it will be 4.3% (as of today). All other barriers are held constant. What do you think will be the impact of this step on the export of sweet pepper?
The quantity exported to the EU will increase to _____
The FOB will change to _____

3) Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of sweet pepper?
The quantity exported to the EU will increase to _____
The FOB will change to _____

4) What will be the impact of reduction of all the import barriers between the EU and all the Mediterranean countries that are part of the project? The quantity will change to _____ the price will change to _____.
What is more restricting the export of sweet pepper (please rank): Quota, window of export, MFN price, the Tariff ?

Potatoes

1) In 2003 the production of potatoes was 354000 tones in 2004 the production was 545000 tones. What will be the potential of the production of potatoes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

2) The quota in 2004 was 30000 tons to be exported between 1 of January to 31 of March. In 2004 the export to EU was 224156 tons. Suppose that under a partial liberalization scenario the quota will increases to 224000 tons and the export two months will be added to the export window (May and June). All other barriers are held constant. What do you think will be the impact of this step on the export of potatoes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

3) Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of potatoes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

4) What will be the impact of reduction of all the import barriers between the EU and all the Mediterranean countries that are part of the project? The quantity will change to _____ the price will change to _____.
What is more restricting the export of potatoes (please rank): Quota, window of export, MFN price, the Tariff?

Grapes

1) The production of grapes is around 70000 tones. What will be the potential of the production of grapes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

2) The export of Israel to EU is limited to the period between 1 of May to 21 of July. After this period the tariff barrier effectively avoids the export. In 2004 the export to EU was 7568 tons. Suppose that under a partial liberalization scenario the export duration will be extended in a month and will end in 21 of August instead in 21 of July. What do you think will be the impact of this step on the export of grapes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

3) Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of grapes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

4) What will be the impact of reduction of all the import barriers between the EU and all the Mediterranean countries that are part of the project? The quantity will change to _____ the price will change to _____.
What is more restricting the export of grapes (please rank): Quota, window of export, MFN price, the Tariff?

Strawberries

1) The production in 2003 was 5500 tones, in 2004 5300 tones. What will be the potential of the production of strawberries in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

2) The quota in 2004 was 2678 tons to be exported between 1 of November to 31 of May. In 2004 the export to EU was 3001 tons. Suppose that under a partial liberalization scenario the quota will increases to 5000 tons. All other barriers are held constant. What do you think will be the impact of this step on the export of strawberries?
The quantity exported to the EU will increase to _____
The FOB will change to _____

3) Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of strawberries?
The quantity exported to the EU will increase to _____
The FOB will change to _____

4) What will be the impact of reduction of all the import barriers between the EU and all the Mediterranean countries that are part of the project? The quantity will change to _____ the price will change to _____.
What is more restricting the export of strawberries (please rank): Quota, window of export, MFN price, the Tariff?

First round results

Tomato first round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	18	10	50	20.28	10.6
Production Potential 2015	18	-20	100	21.94	24.8
Export quantity 2008	17	10,000	30,000	21,647	5,159
Price FOB 2008	18	1,300	3,000	1,661	355
Export 2015	18	10,000	50,000	26,000	10,991
Price FOB2015	17	1,000	1,850	1,485	223
2008 –Partial Liberalization	2015- Full Liberalization				

Pepper					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	19	5	50	19.2	11.6
Production Potential 2015	19	0	70	23.95	17
Export quantity 2008	19	40,000	100,000	66,789	19,306
Price FOB 2008	19	1,000	1,500	1,247	145
Export 2015	19	40,000	150,000	85,316	28,898
Price FOB2015	18	800	1,350	1,175	194
2008 –Partial Liberalization	2015- Full Liberalization				

Potatoes					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	18	0	50	11.67	12.13
Production Potential 2015	18	0	100	16.94	23.08
Export quantity 2008	20	200,000	350,000	260,500	32,683
Price FOB 2008	20	185	250	218	20
Export 2015	20	200,000	400,000	302,500	54,519
Price FOB2015	20	175	2,000	298	401
2008 –Partial Liberalization	2015- Full Liberalization				

Grapes					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	12	0	50	20.8	13.8
Production Potential 2015	12	5	70	25	17.2
Export quantity 2008	13	8,500	15,000	10,931	1,896
Price FOB 2008	11	1,000	1,600	1,109	243
Export 2015	12	11,000	50,000	19,250	10,411
Price FOB2015	11	900	1,600	1,145	225
2008 –Partial Liberalization	2015- Full Liberalization				

Strawberries					
Results of the first round	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	14	5	50	16.79	11.54
Production Potential 2015	14	0	80	20.71	20.56
Export quantity 2008	15	2,000	5,000	3,353	751
Price FOB 2008	15	1,500	6,000	4,200	1,192
Export 2015	14	2,000	7,000	4,143	1,231
Price FOB2015	15	1,300	6,000	3,807	1,272

2008 –Partial Liberalization 2015- Full Liberalization

5) The expert opinion survey: Second round

Dear Participant
We highly appreciate your time in responding to the first part of our research. Your answers and comments provided us with valuable information. After processing and analyzing the answers that were collected in the first round we are ready to the second and final stage of the survey. At the second stage we send you again the questionnaire with one difference: below every question we provide information about the mean, standard deviation, maximum and minimum values that where calculated from the answers obtained at the first round. The mean represents the average response from the entire panel, the maximum and the minimum values represent the upper and lower bounds of the responses and the standard deviation represents level of consensus. Low standard deviation represents higher level of consensus and high standard deviation represents low level of consensus.

The individual results are kept confidential and all the responders receive only mean, standard deviation and extreme values.

The results of the first round are provided to you in order to give you additional information. You may revise your evaluations but you are not obliged to do so. If you retain your previous evaluations please write it specifically, otherwise answer the question again.

There are no right or wrong answers, and your valuation or your educated estimation is exactly what we need in order to conduct our forecast. You were selected as an expert in your field, and therefore you participation is so important for us. We appreciate your time in helping us help the industry.

Thank you,

General guidelines – please answer all the following questions. If you do not have information on a specific industry, you can provide your estimation. If you cannot estimate, please indicate that you can not provide us with an answer to this question.

Tomatoes, cherry tomatoes and other tomatoes.

The production of tomatoes in 2003 in Israel was 378000 tones. In 2004 it was 496000 tones. What will be the potential of the production of tomatoes, cherry tomatoes and other tomatoes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

Results of the first round

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	10	50	20.28	10.64
Production Potential 2015	-20	100	21.94	24.80

The EU quota in 2004 was 10000 tons. Import tax inside the quota is 0% and above the quota an import tax of 8.8%-14.4% is applied (the higher tax is applied in the summer). In 2004 the export was of 15333 tons. Suppose that under a partial liberalization scenario the quota increases to 20000 tons. All other barriers are held constant. What do you think will be the impact of this step on the export of tomatoes, cherry tomatoes and other tomatoes?

The quantity exported to the EU will increase to _____

Results of the first round

	Minimum	Maximum	Mean	Std. Deviation
Export quantity 2008	10,000	30,000	21,647	5,159

The FOB price, which was on average $1700 per ton will change as a result of changes in quantity in 2008 to _____

	Minimum	Maximum	Mean	Std. Deviation
Price FOB 2008	1,300	3,000	1,661	355

Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of tomatoes, cherry tomatoes and other tomatoes?

The quantity exported to the EU will increase to _____

The FOB will change to _____

Results of the first round

	Minimum	Maximum	Mean	Std. Deviation
Export 2015	10,000	50,000	26,000	10,990
Price FOB2015	1,000	1,850	1,485	223

What restricts more the export of tomatoes and cherry tomatoes (please rank): Quota, window of export, MFN price, the Tariff?

Sweet Pepper

The production of sweet pepper in 2003 was 94000 tones. In 2004 it was 112000 tones. What will be the potential of the production of sweet pepper in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	5	50	19.2	11.6
Production Potential 2015	0	70	24	17

The quota in 2004 was 15700 tons. In 2007 as part of the WTO agreements the quota will increase to 17248 tons. In 2004 the export was 40929 tons. Suppose that under a partial liberalization scenario the quota will increases to 61000 tons. The ad valorem tariff in the quota will decrease from 0.9% to 0.45% and above the quota it will be 4.3% (as of today). All other barriers are held constant. What do you think will be the impact of this step on the export of sweet pepper?
The quantity exported to the EU will increase to _____
The FOB will change to _____

	Minimum	Maximum	Mean	Std. Deviation
Export quantity 2008	40,000.00	100,000.00	66,789	19,306.24
Price FOB 2008	1,000.00	1,500.00	1,247	144.79

Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of sweet pepper?
The quantity exported to the EU will increase to _____
The FOB will change to _____

	Minimum	Maximum	Mean	Std. Deviation
Export 2015	40,000.00	150,000.00	85,316	28,897.91
Price FOB2015	800.00	1,350.00	1,175	194.22

What is more restricting the export of sweet pepper (please rank): Quota, window of export, MFN price, the Tariff ?

Potatoes

In 2003 the production of potatoes was 354000 tones in 2004 the production was 545000 tones. What will be the potential of the production of potatoes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	0	50	11.67	12.13
Production Potential 2015	0	100	16.94	23.08

The quota in 2004 was 30000 tons to be exported between 1 of January to 31 of March. In 2004 the export to EU was 224156 tons. Suppose that under a partial liberalization scenario the quota will increases to 224000 tons and the export two months will be added to the export window (May and June). All other barriers are held constant. What do you think will be the impact of this step on the export of potatoes?

The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Export quantity 2008	200,000	350,000	260,500	32,683
Price FOB 2008	185	250	218	20

Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of potatoes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Export 2015	200,000	400,000	302,500	54,519
Price FOB2015	175	2,000	298	401

What is more restricting the export of potatoes (please rank): Quota, window of export, MFN price, the Tariff?

Grapes

The production of grapes is around 70000 tones. What will be the potential of the production of grapes in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	0	50	20.8	13.8
Production Potential 2015	5	70	25	17.2

The export of Israel to EU is limited to the period between 1 of May to 21 of July. After this period the tariff barrier effectively avoids the export. In 2004 the export to EU was 7568 tons. Suppose that under a partial liberalization scenario the export duration will be extended in a month and will end in 21 of August instead in 21 of July. What do you think will be the impact of this step on the export of grapes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Export quantity 2008	8,500	15,000	10,931	1,896
Price FOB 2008	1,000	1,600	1,109	243

Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of grapes?
The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Price FOB 2008	1,000	1,600	1,109	243
Export 2015	11,000	50,000	19,250	10,411
Price FOB2015	900	1,600	1,145	225

What is more restricting the export of grapes (please rank): Quota, window of export, MFN price, the Tariff?

Strawberries

The production in 2003 was 5500 tones, in 2004 5300 tones. What will be the potential of the production of strawberries in 2008 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___) and in 2015 relative to 2004 (-30%, -10%,-5%, 0%, + 5%, +10%, +30% other___).

Results of the first round	Minimum	Maximum	Mean	Std. Deviation

Production Potential 2008	5	50	16.79	11.54
Production Potential 2015	0	80	20.71	20.56

The quota in 2004 was 2678 tons to be exported between 1 of November to 31 of May. In 2004 the export to EU was 3001 tons. Suppose that under a partial liberalization scenario the quota will increases to 5000 tons. All other barriers are held constant. What do you think will be the impact of this step on the export of strawberries?
The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Export quantity 2008	2,000	5,000	3,353	751
Price FOB 2008	1,500	6,000	4,200	1,192

Now suppose that there is a full liberalization (no barriers are applied). What do you think will be the impact of full liberalization on the export of strawberries?
The quantity exported to the EU will increase to _____
The FOB will change to _____

Results of the first round	Minimum	Maximum	Mean	Std. Deviation
Export 2015	2,000	7,000	4,143	1,231
Price FOB2015	1,300	6,000	3,807	1,272

What is more restricting the export of strawberries (please rank): Quota, window of export, MFN price, the Tariff?

Results of second round

Tomato 2nd round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	18	10	50	20.3	10.6
Production Potential 2015	18	-20	100	21.9	24.8
Export quantity 2008	17	15,000	30,000	22,353	4,197
Price FOB 2008	18	1,300	3,000	1,661	355
Export 2015	18	13,500	50,000	27,000	10,173
Price FOB 2015	17	1,000	1,850	1,472	216

Pepper 2nd round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	19	5	50	19.2	11.6
Production Potential 2015	19	0	70	23.7	17.3
Export quantity 2008	19	45,000	100,000	68,895	18,381
Price FOB 2008	19	1,000	1,500	1,234	140
Export 2015	19	46,000	150,000	88,579	26,765
Price FOB 2015	18	800	1,350	1,158	183

potatoes 2nd round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	18	0	50	11.7	12.1
Production Potential 2015	18	0	100	17.2	22.9
Export quantity 2008	20	200,000	350,000	263,250	31,842
Price FOB 2008	20	185	250	218	20
Export 2015	20	220,000	400,000	307,250	49,377
Price FOB 2015	20	175	2,000	298	401

Grapes 2nd round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	12	0	50	20.8	13.8
Production Potential 2015	12	5	70	25.0	17.2
Export quantity 2008	13	8,500	18,000	11,546	2,698
Price FOB 2008	12	1,000	1,600	1,150	239
Export 2015	12	11,000	50,000	19,667	10,325
Price FOB 2015	12	900	1,600	1,171	214

Strawberries 2nd round					
	N	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	14	5	50	16.4	11.8
Production Potential 2015	14	0	80	20.4	20.4
Export quantity 2008	15	2,000	5,000	3,353	751
Price FOB 2008	15	1,500	6,000	4,167	1,205
Export 2015	14	2,000	7,000	4,179	1,203
Price FOB 2015	15	1,300	6,000	3,787	1,280

6) Comparing the first and the second round

The theory suggests that the new information will be used to update prior evaluations. The magnitude of updating is a function of strength in prior beliefs (initial evaluation) and the reliability and coherence of the new information. Thus if a responder is not very sure in his evaluation he will use the new information, representing the consensus, in order to update valuation. On the other hand if the responder is very confident in his initial evaluation, the new information will be discounted. This updating procedure gives rise to a lower standard deviation and drives averages to their "true value", i.e., their value under perfect information. It is hard to expect that the upper limits will increase and the lower limits will decrease since the responses are converging toward the center (mean). The results indicate that the minimum values were raised (moving to the center) in three of the five categories (tomatoes, pepper and potatoes). The maximum value was not changed except for grapes in one case (export in 2008) where the new information affected results in the opposite way, i.e., larger disagreement.

The responders did not change their valuation of the potential production and thus changes in these figures will not be presented. The standard deviations became smaller and changes were made more frequently in the quantities under the two scenarios of liberalization. The following table presents changes in evaluation on the five product categories.

		Minimum	Maximum	Mean	Std. Deviation
Tomatoes	Export quantity 2008	5,000	0	706	-962
	Price FOB 2008	0	0	0	0
	Export 2015	3,500	0	1,000	-817
	Price FOB 2015	0	0	-14	-7
Pepper	Export quantity 2008	5,000	0	2,105	-925
	Price FOB 2008	0	0	-14	-4
	Export 2015	6,000	0	3,263	-2,133
	Price FOB 2015	0	0	-17	-11
Potatoes	Export quantity 2008	0	0	2,750	-841
	Price FOB 2008	0	0	0	0
	Export 2015	20,000	0	4,750	-5,142
	Price FOB 2015	0	0	0	0
Grapes	Export quantity 2008	0	3,000	615	802
	Price FOB 2008	0	0	41	-3
	Export 2015	0	0	417	-86
	Price FOB 2015	0	0	25	-12
Strawberries	Export quantity 2008	0	0	0	0
	Price FOB 2008	0	0	-33	13
	Export 2015	0	0	36	-29
	Price FOB 2015	0	0	-20	7

The decrease in the standard deviation and the fact that the means were mostly unchanged (updated only in the case of grapes export under partial liberalization) led us to adopt evaluations of the second round as the base for our analysis.

7) Analysis of survey's result

We start by presenting the information on production by purpose in the last three years and the forecast of the panel. This section will be followed by comparin panel forecasts with forecasts based on regression analysis.

Tomatoes

The production by purpose (intermediate is omitted) in 2002-2004 is presented in the following table

Product	Total			Industry			Local consumption			Export		
	Thousand tones			Thousand tones			Thousand tones			Thousand tones		
	2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002
Tomatoes Total	512.0	405.6	388.3	287.5	171.0	157.6	203.0	206.2	201.4	21.5	20.1	16.8
Tomatoes regular and cluster	193.8	206.9	207.5	-	-	-	189.0	193.2	189.9	4.8	5.5	5.1
Tomatoes Cherri	30.7	27.7	23.2	-	-	-	14.0	13.0	11.5	16.7	14.7	11.7
Tomatoes Industry	287.5	171.0	157.6	287.5	171.0	157.6	-	-	-	-	-	-

The panel forecasts are presented in the following table.

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	10	50	20.3	10.6
Production Potential 2015	-20	100	21.9	24.8
Export quantity 2008	15,000	30,000	22,353	4,197
Export 2015	13,500	50,000	27,000	10,173

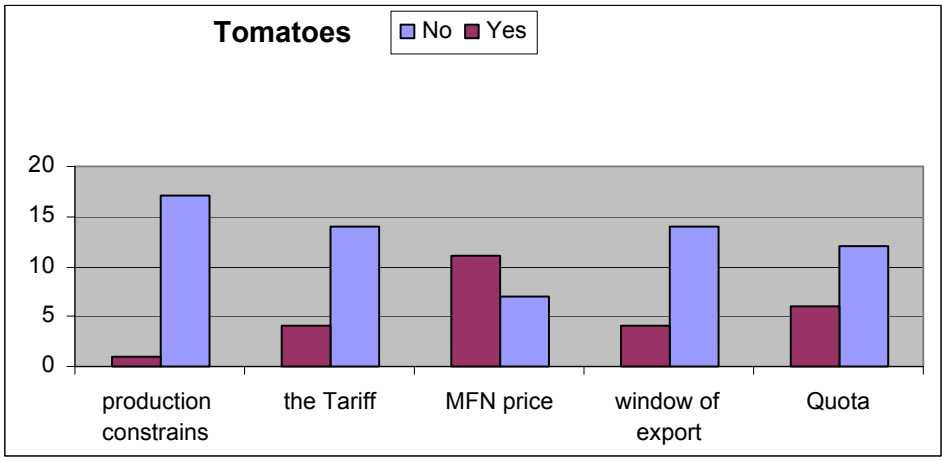
The average panel forecast of production in 2008 is 610 thousand tones (512 in 2004) and 624 thousand tones in 2015. The exported quantity for the partial liberalization scenario is 22300 tones (21 in 2004) and with full liberalization the export will reach 27000 tones – a 28% increase. The experts thus estimated that the share of export will increase as the quota is doubled (from 10000 to 20000 tones).

Prices

The current tomatoes FOB price is 1700 euro per tone. The panel expected a decline to 1661 euro per tone in 2008 and 1441 euro per tone in 2015 -- a decline of 2.3% and 13.5% respectively.

The most binding constraint of tomatoes export is the MFN price, which is the entry reference price for import tax calculations, followed by export quotas. Production constrains (water, water price, labor and land) has small impact on export. Figure 5 illustrates graphically the responses to the question regarding the "…. the most binding constrain for export of tomatoes (list if the five constrains)"

Figure (5)



Pepper

Pepper production by purpose (intermediate is omitted) in 2002-2004 is presented in the following table

Total			Industry			Local consumption			Export		
Thousand tones			Thousand tones			Thousand tones			Thousand tones		
2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002
127.6	113.4	110.9	2.4	2.0	2.0	71.5	69.6	73.0	53.7	41.8	35.9

The panel forecasts are presented in the following table.

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	5	50	19.2	11.6
Production Potential 2015	0	70	23.7	17.3
Export quantity 2008	45,000	100,000	68,895	18,381
Export 2015	46,000	150,000	88,579	26,765

The panel forecasted that production in 2008 will be 152 thousand tones (127.6 in 2004) and will reach 158 thousand tones in 2015. Pepper export in the partial liberalization scenario is estimated at 68895 tones (In 2004 Israel exported 53700 tones, of which 40929 went to the EU) and with full liberalization the export will reach 88579 tones- increase of 65%. The experts thus estimated that the export is constrained by the import barriers of EU.

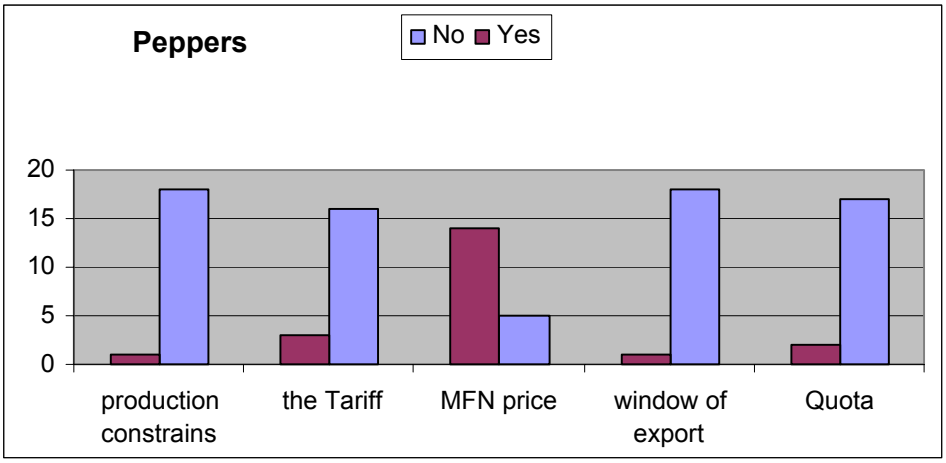
Effect of increase in quantity exported on prices

The current FOB pepper price is in the range of 1200 – 1500 euro per tone. The experts forecast that the increase in quantity will result in sharp decline of price. The price is expected to decline to 1234 euro per tone in 2008 and 1158 euro per tone in 2015 with full liberalization.

The most binding constrain for pepper export is MFN price, followed by Tariffs. This view is similar to the one presented in tomatoes but the difference are in the magnitude and in the second binding constrain. Production constrains (water, water price, labor and land) has no

impact on export. Figure 6 illustrates graphically the responses to the question regarding "….. the most binding constrain for export of peppers (list the five constrains)"

Figure 6



Potatoes

Potatoes production (by purpose) in 2002-2004 is presented in the following table.

Intermediate			Industry			Local consumption			Export			Total		
Thousand tones			Thousand tones			Thousand tones			Thousand tones			Thousand tones		
2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002
17.2	6.0	6.2	45.0	45.0	50.0	257.0	231.5	236.8	251.6	133.6	100.1	570.8	416.1	393.1

The panel forecast is presented in the following table

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	0	50	11.7	12.1
Production Potential 2015	0	100	17.2	22.9
Export quantity 2008	200,000	350,000	263,250	31,842
Export 2015	220,000	400,000	307,250	49,377

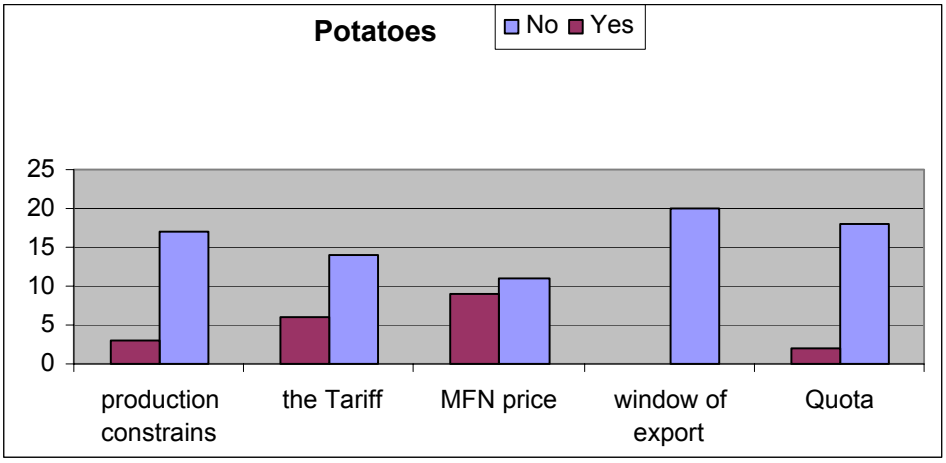
The panel forecasted 637 thousand tones production in 2008 (570.8 tones in 2004) and 669 thousand ton in 2015. The exported quantity for the partial liberalization scenario is 263250 tones (251000 tones in 2004, of which 224156 tones are exported to the EU) and with full liberalization the export will reach 307250 tones – an increase of 22.4%. We can conclude that the experts think that potatoes export is constrained by EU import barriers.

Effects of increase in quantity exported on prices

The current FOB potatoes price is in the range of 220 euro per tone The price is expected to decline to 218 euro per tone in 2008 and increase to 298 euro per tone in 2015 after full liberalization. The two price estimates are not straightforward. In the current price of 220 euro per tone the profitability of exporting potatoes is questionable, thus a larger export under a lower price is, at best, odd. The price in 2015 is supposed to increase while the quantity continues to increase. This will happen if potatoes production becomes more efficient or demand shifts upward (e.g., as a result of improved variety) or both.

The most binding constrain for potatoes export is MFN price, followed by Tariffs. The difference between the MFN price and tariff becomes smaller, compared to the previous crops discussed. Production constrains (water, water price, labor and land) has no impact on export. Figure 7 illustrates graphically the responses to the question regarding "…..the most binding constrain for export of peppers (list the five constrains)".

Figure (7)



Grapes

Grape production by purpose in 2002-2004.

Intermediate			Industry			Local consumption			Export			Total		
Thousand tones			Thousand tones			Thousand tones			Thousand tones			Thousand tones		
2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002
1.2	0.8	0.5	2.3	2.5	2.3	63.2	62.6	62.4	6.7	3.1	4.9	73.5	68.9	70.2

The panel forecast is presented in the following table

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	0	50	20.8	13.8
Production Potential 2015	5	70	25.0	17.2
Export quantity 2008	8,500	18,000	11,546	2,698
Export 2015	11,000	50,000	19,667	10,325

According to the panel forecast, the production of grapes in 2008 will be 88.8 thousand tones (73.5 in 2004) and will reach 92 thousand tones in 2015. The exported quantity under the partial liberalization scenario is 11546 tones (compare with 6700 tones export to the EU in 2004) and will reach 19667 tones under full liberalization - increase of 72% and 193%, respectively. The experts thus think that the export is constrained mainly by EU's import barriers.

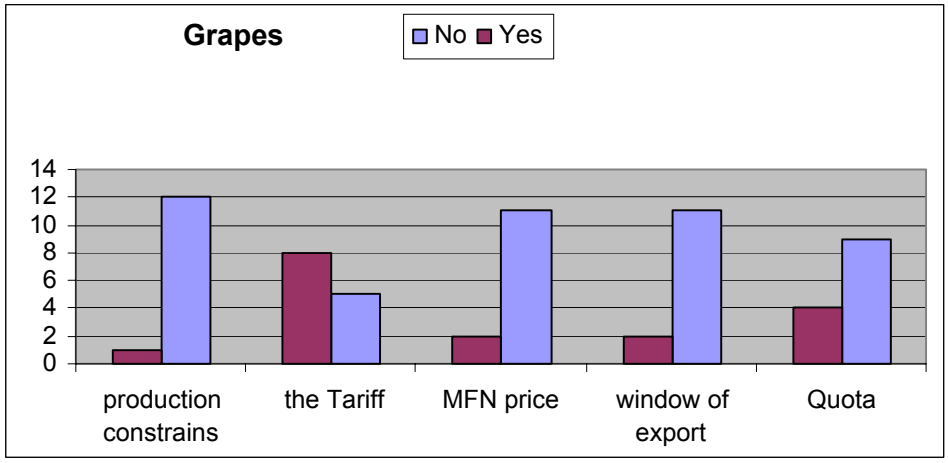
Effect of increase in quantity exported on price

The current rapes FOB price is around 1800 -1600 euro per tone. The price is expected to decline to 1150 euro per tone in 2008 and increase slightly to 1170 euro per tone in 2015. Again the increase of price between 2008 and 2015 is not easy to explain.

The most binding export constraint for grapes is tariffs. Grapes are the only product for which the experts panel thought that tariffs are the most binding trade constraint. Production factors (water, water price, labor and land) have no impact on export.

Figure 8 illustrates graphically the responses to the question regarding "…..the most binding constrain for export of peppers (list the five constrains)".

Figure (8)



Strawberries

The following Table presents production data by purpose for 2002-2004.

Total			Industry			Local consumption			Export		
Thousand tones			Thousand tones			Thousand tones			Thousand tones		
2004	2003	2002	2004	2003	2002	2004	2003	2002	2004	2003	2002
			-	-	-	14.7	13.8	14.2	2.9	2.3	2.2
17.6	16.0	16.4									

The panel forecasts are presented in the following table.

	Minimum	Maximum	Mean	Std. Deviation
Production Potential 2008	5	50	16.4	11.8
Production Potential 2015	0	80	20.4	20.4
Export quantity 2008	2,000	5,000	3,353	751
Export 2015	2,000	7,000	4,179	1,203

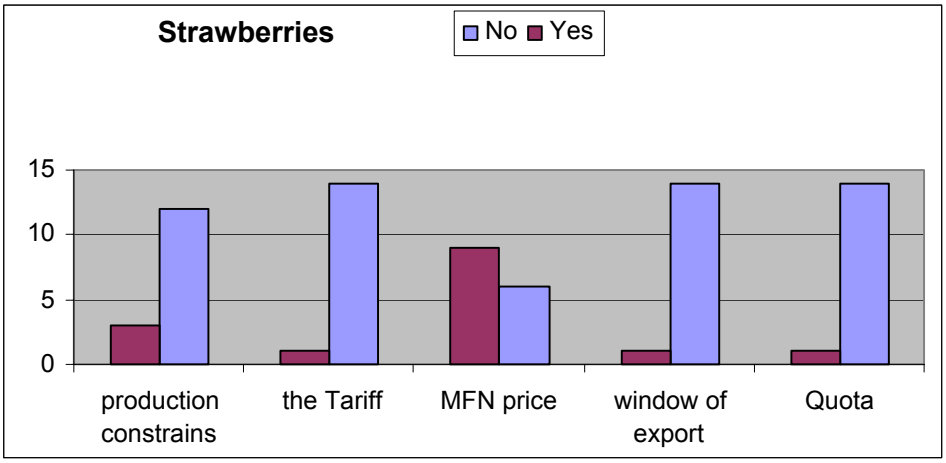
The panel forecast that the production of grapes will be 20.5 thousand tones in 2008 (compare with 17.6 thousand tones in 2004) and 21.2 thousand tones in 2015. The exported quantity for the partial liberalization scenario is estimated at 3353 tones (compare with 2900 tones of export to EU in 2004) and under full liberalization the export will reach 4179 tones- and increase of 16% and 44% respectively. The growth of export due to liberalization is very modest (about 500 tones under partial liberalization and 800 tones under full liberalization). The effective constraint is the intensive labor input in production

The current FOB price is about 5000 euro per tone. The experts' panel thinks it will decline to about 4167 euro per tone in 2008 and 3787 euro per tone in 2015 under full liberalization.

The most binding constrain for strawberries export is again the MFN price. Strawberries are the only crop for which the experts' panel thinks that production constrains will be binding.

Figure 9 shows graphically the responses to the question regarding "…. the most binding constrain for export of peppers (list the five constrains)".

Figure (9)



8) Closing comments

We use the Delphi methodology to evaluate the impacts of two trade liberalization scenarios on agriculture trade between Israel and the EU. The study covers effects on the export of Israeli agricultural products to the EU but ignores the possibility of import from EU (and other Mediterranean countries) to Israel. The possibility of increased imports into Israeli raised concern during our discussions and interviews.

Another issue that surfaced during the interviews was the choice of the product categories. Most experts were puzzled why flowers – a major export crop – were not part of the survey and why strawberries were included.

Overall, trade liberalization is excepted to increase Israeli export agricultural products to the EU by about 12-60% and decrease prices by 3%-15% . In general, the production is expected to increase in all product categories.

It is possible that the experts had hard time evaluating the effects of trade liberalization on competition, thus their forecasts are based on partial aspects of liberalization.