Centre for Development Innovation

Assessment of the Soft Fruit Sector

Croatia

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Market Opportunity Report

Soft Fruit Sector

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Project (BO-10-001-233) Value chain analysis in fresh fruit and vegetable supply sector

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This report has been developed on the request of the Royal Dutch Embassy in Zagreb to contribute to enhancing the oft fruit sector in Croatia.

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1 Introduction

1.1 Introduction to Croatia

The Republic of Croatia, is a unitary democratic parliamentary republic at the crossroads of Central Europe, the Balkans, and the Mediterranean. Its capital and largest city is Zagreb. Population of the country is 4.28 million; the population growth rate is -2.2% (2011). The total land area of 56,594 km^2 (territorial sea makes up 31,067 km^2). The country is characterised by considerable natural and climatic diversity, which is also reflected in the range of agricultural production, ranging from traditional continental arable and industrial crops to vineyards and to Mediterranean fruits and vegetables.

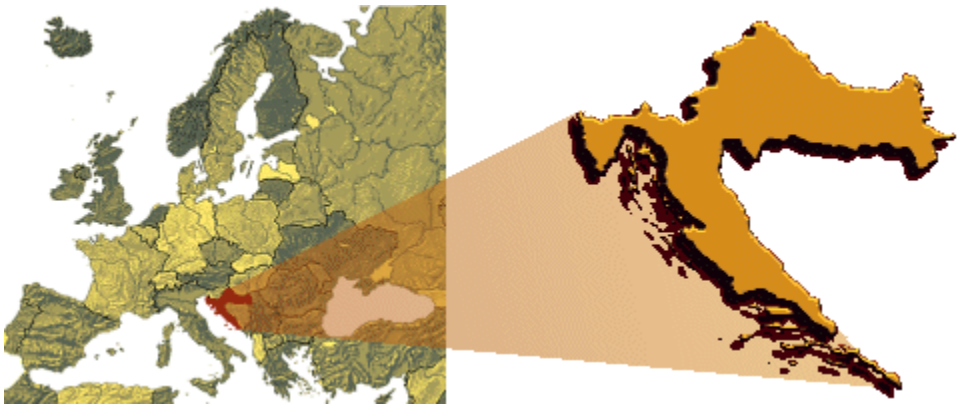
Croatia has a high-income market economy. International Monetary Fund data shows that Croatian nominal GDP stood at USD 63,842 billion, or USD 14,457 per capita, at the same time in 2011 while purchasing power parity GDP was USD 80,334 billion or USD 18,191 per capita. According to Eurostat data, Croatian PPS GDP per capita stood at 61% of the EU average in 2012.

Real GDP growth in 2007 was 6.0%. The average net salary of a Croatian worker in March 2013 was HRK 5,516 (USD 988) per month. As of March 2013, registered unemployment rate in Croatia was 20.9%.

In 2010, economic output was dominated by the service sector which accounted for 66% of GDP, followed by the industrial sector with 27.2% and agriculture accounting for 6.8% of GDP. According to 2004 data, 2.7% of the workforce were employed in agriculture, 32.8% by industry and 64.5% in services. In 2011, Croatian exports were valued at 1.591,8 million USD with 2.621 million USD worth of imports. The largest trading partner has been the European Union.

Privatization and the drive toward a market economy had barely begun under the new Croatian Government when war broke out in 1991. As a result of the war, the economic infrastructure sustained massive damage, particularly the revenue-rich tourism industry. The Croatian state still controls a significant part of the economy, with government expenditures accounting for as much as 40% of GDP. A backlogged judiciary system, combined with inefficient public administration, especially on issues of land ownership and corruption, are particular concerns. In 2011 the country has been ranked 66th by Transparency International with a Corruption Perceptions Index of 4.0. In October 2012, the national debt stood at 52.1% of the nation's GDP.

Figure 1. Map of Croatia



Croatia applied for EU membership in 2003 and Candidate country status was granted to Croatia by the European Council in mid-2004. The entry negotiations began in October 2005 (03/10/2005) together with

the screening process. Croatia finished accession negotiations on 30 June 2011 and on 9 December 2011 signed the Treaty of Accession to become the bloc's 28th member. Entry into force and accession of Croatia to the took place on 1 July 2013.

The new agricultural policy in the fruit and vegetable sector covers three components:

1. National strategy for sustainable operation programs for producer organization in fruit and vegetable sector (official gazette 082/2013)
2. School fruit scheme (Official gazette 088/2013)
3. Marketing standards, and issuing of certificates

Ordinance on marketing standards for fruit and vegetables (Official Gazette 047/2012)

Many challenges are foreseen with regards to marketing standards. Policy document on the subject has been drawn up, but implementation will require time and much effort. The EU accession will have big impact on dealing with import and export from third countries.

Currently, producers are not required to obtain certificate to be able to put produces on the domestic market. Even inspectors do not have enough knowledge to implement and control the new regulations, therefore, it cannot be expected that producer will comply overnight.

Producers are not yet organized in producer groups as it is laid down in EU regulations. In Croatia, a producer group is a legal entity that can be organized as a cooperative , in which case it has to comply with the cooperative law), limited liability company or joint stock company, in which cases it has to comply with the trade law.

There are many challenges in Croatia around setting up producer organizations that are in line with the EU legislation and that can take advantage of the opportunities offered by EU accession. Producers often do not have enough knowledge about the requirements regarding setting up an operating producer groups according to the EU legislation and of the benefits that can be derived joining a producer organization. The bad experience with state owned cooperative and lack of trust among farmers further hinder progression and becoming competitive on the EU market.

Through the first pillar of the Common Agricultural Policy (CAP) it will be possible to access a variety of financial instruments in agriculture (support for certification, insurance premium, environmental programs, market research) to help individuals as well we producer organizations compete in the market, however there are concerns that many people will not be able to recognize let alone take advantage of the offered opportunities. Majority of farmers do not have enough time and knowledge to access available information and enter into a bureaucratic process with success.

1.3 Fruit production in Croatia

Fruit production in Croatia is mostly based on production located on agricultural farms and is mostly not market directed. In 2007 the fruit and vegetable sector represented 12% of the Gross Agricultural Output (GAO). In general in both fruit and vegetable sub-sectors a sensitive decreasing of production is recorded. Current circumstances of home fruit production do not satisfy even 50% of domestic needs

Table 1	Self-sufficiency of Croatian agriculture 2000-2007 (%)	
	Average 2000-07.	**Average 2005-07.**
Grain total	99	99
Wheat	108	106
Barley	83	84
Maize	98	98
Vegetable oil-total	58	57
Olive oil	72	76
Sugar	95	109
Honey	153	125
Potato	77	79
Vegetable -total	66	68
Tomato	36	35
Cabbage	98	100
Onion and garlic	79	84
Melon and Watermelon	76	78
Fruit-total	49	54
Apple	72	85
Pear	38	29
Peach	40	34
Tangerine	120	134
Plum	92	92
Grape	93	92
Wine	96	90
Meat total	84	79
Cattle	72	69
Pig	77	71
Sheep and goat	74	71
Poultry	99	95
Milk	88	93
Fresh dairy products	97	106
Cheese and processed	82	80
Eggs	99	96

The reasons for it are mostly state inherited.

- Disregard and lack of recognition of fruit growing in Croatia within the period before independence; according to the then unofficial distribution of production in ex-Yugoslavia in which gave priority to fruit and vegetable production outside Croatia to Macedonia, Serbia. Processing was located in Croatia based on raw materials coming from Macedonia and Serbia.
- War (1991-1995) + peaceful reintegration of eastern part of Croatia (Slavonia and Baranja) in 1998.
- Shortage of more stimulating agricultural policy measures to help restructure the existing mostly extensive and agricultural production, into working and capital intense production in fruit growing, viticulture, olive growing, vegetable growing and floriculture.

To support domestic production of fruit, wine and olive groves, Ministry of Agriculture (MoA) initiated Operational Programme (OP) of establishing perennial crops in 2004. Program had a goal to encourage farmers (winemakers and fruit growers) to invest into nurseries, vineyards, and orchards rejuvenation and planting. Goals were to raise productivity, quality, and competitiveness in general. Official reports on the efficiency of OP exist although they are quite fuzzy. According to the available information, in the period of 2004-2009 about 11 thousand hectares of new orchards, about 7 thousand hectares of new vineyards and 5 thousand hectares of new olive groves were established. Detailed analysis will not find support for those figures in the official statistics! Analysis made by Mario Njavro at the University of Zagreb shows that about 50 hectares of new raspberry plantation have been established and about 12 hectares of new blackberry plantations. Besides the above mentioned OP, Croatian Government has a history of supporting of fruit growers in planting new orchards, with capital-intensive investments support programmes for agricultural households, and lately it coordinates IPARD, the EU pre-accession fund.

Because of such unfavourable production structures, and lack of organization of market, Croatia imports significant quantities of all types of fruit, apples more than 50% of home consumption, pears 80% and peaches 70%.

1.4 History of soft fruit production in Croatia

Strawberry

Soft fruit production has a long history in Croatia. In the early 1930s, strawberry production technology was imported from California. The II WW interrupted the production, which was revived only in the 1970s with Italian inputs: varieties, irrigation and fertilizers. During that time, Croatia exported strawberries to Germany. Unfortunately, production was once again destroyed by the war (1991-1995).

In addition, during the area of Yugoslavia, Croatia was the main area for processing industries, while Serbia, Bosnia Herzegovina were the focus areas for primary production due to the size of available land there, which was more preferable for production.

Fragaria, the biggest company engaged in soft fruit production, started strawberry production on 20 ha, and selling to export markets such as Germany and Sweden. Main time of harvest is May, after strawberries from Spain disappear from the market and before Polish strawberries enter.

Raspberry production was introduced on large scale in 1980s. The more than 100 ha production area demanded much labour, which was not available at that time. 1 ha requires 10

people, and it was not possible to hire 1000 people to work on the field. The initiative failed and left bad feelings behind.

Fragaria started raspberry production on 50 ha in collaboration with others 5 years ago in hope for increase in domestic demand. They have set up a processing plant to freeze soft fruits in case customers require frozen products.

Blueberries have no commercial production history in Croatia. It is only the last 6-7 years the blueberry plantations have been set up due to increase in demand. Health benefits of blueberries are strongly advertised in Croatia, consumers are looking for it, therefore, supermarkets decided to carry the product.

2 Supply

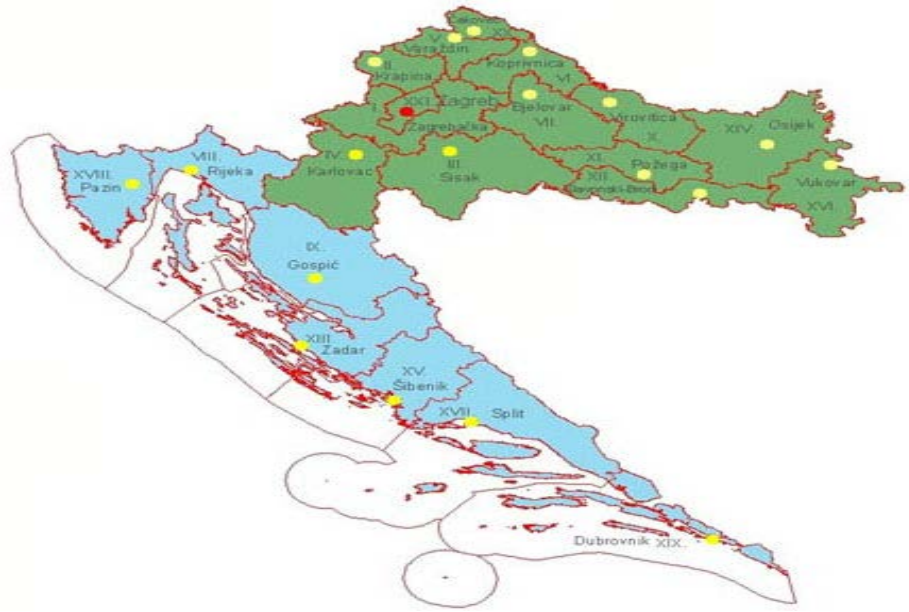
2.1 Regions of soft fruit growing

Republic of Croatia is divided into two statistical regions (NUTS2 level):

1. Continental Croatia, which encompasses 56% of the teritory and 67% of the population, and
2. Adriatic Croatia.

According to the administrative organization, Croatia is divided on 20 counties (NUTS3 level), and City of Zagreb as special administraive unit.

Figure 2. Map of Croatia's NUTS2 regions and counties



Main soft fruit produced in Croatia are strawberry, raspberry, blackberry, blueberry and Aronia.

There are three main categories for regions for berry production in Croatia:

- Vrgorac in middle Dalmatia with Mediterranean climate
- County Zagreb with continental climate
- Other areas favourable for soft fruit production:
  - Podravina with continental climate
  - Slavonia with continental climate
  - Istria with Mediterranean),
  - An opportunity is to grow berry in the Lika Gorski Kotar, which is so fare no exploited. The region has mountainous climate with good soil, Due to the clean soil, water and air there is prospect for organic berry production. As a result of the mountainous berry production here could complement the growing seasons of Zagreb County and Vrgorac since in this area vegetation starts 2-3 weeks later. It would also offer employment opportunity in the region that is currently underdeveloped and suffers from rural depopulation.

2.2 Production areas

The interviews carried out supplied the information in the table below.

Table 2	Soft fruit production areas in Croatia
Produce	**Area (hectare)**
Strawberry	200 ha
Raspberry	200 ha
Blackberry	150 ha
Blueberries	20 ha

2.3 Achieved yield in conventional and in ecological production

Exact quantities of berries being grown in Croatia are hard to estimate since the part of production comes from family run farms, and due to disproportion between the official statistical data and the field data. However, it is indisputable that the strawberries make two-third of berry fruit production on domestic market with trend of further increase. This is undoubtedly the most demanded berry fruit, which is supported by significant increase of strawberry growing areas in the last 15 years.

Table 3	Achieved yield	
Produce	**Yield/ha (conventional production**	**Yield /ha (ecological production)**
Strawberry	20 tons -	17 tons /ha
Raspberry	13 tons/ha	10 tons/ha
Blackberry	15 tons/ha	10 tons/ha
Blueberries	9 tons/ha	7 tons / ha
Aronia		5 tons /ha

Yield for strawberries:

- 1st year: 50 dkg/plant
- 2nd year: 50 dkg / plant, but quality is less, fruits are smaller

Cooperation between farmers and buyers can be a challenge in Croatia. Side-selling and lack of enforcement of contracts deter buyers from signing long-term agreements. Selling to third parties despite receiving inputs and extension services from buyers are not unheard of. There are, however, positive examples: Fragaria.

As comparison, with intensive cultivation the following yield can be achieved today:

- Strawberry 25 – 35 tons/ha table tops; Strawberry glasshouse 100 -120 tons/ha.
- Raspberry 20 - 40 tons/ha
- Blackberry 40 - 60 tons/ha
- Blueberry 20 - 25 tons/ha.

2.4 Varieties

From the carried out interviews the following varieties were mentioned as being grown in Croatia:

Table 4	
Plant	Main varieties produced for commercial production
Strawberries	Clery, Jolly, Albion, Elsanta
Raspberries	Willamette, Meeker and Sugana
Blackberries:	Thornfree, Black Satin, Hull Thornless
Blueberries	Blue Crop, Blue ray, Spartan, Yersey, Duke

2.5 Planting material

Strawberries

- Strawberries are propagated with "Frigo" plantlets that are young one-year old strawberry plants stored in a cold room and used for production plantations. These plantlets are dug out in November and December and after removing old leaves and runners they are kept in storage room at the temperature of 2° and in these conditions they can be stored until July and August of the following year. If needed, they can be planted in the field or under covers at any time. These plants bear their first crop in 8-10 weeks after planting and in the following years they crop at times typical of the individual cultivars.
  Frigo plants used for planting for strawberries in Croatia are imported mainly from Italy or from the Netherlands. Polish plant material is the cheapest as labour is cheap in Poland. However the quality of neither the Italian nor the Polish plant material comes close to that of the Dutch according to one of the interviews. However, Fragaria was convinced that the Italian varieties are better adapted to the Croatian environment: poor soil and hot weather.
- In vitro propagation during which microscopic plants to be grown in special conditions for 2 years and sold to producers, is not used in Croatia.
- Self-propagation: some producers are engaged in reproduction of strawberries by cutting off the flowers, and allow plant to produce new shoots, which farmers cut off and replant.

Raspberries, blackberries, blueberries, gooseberries are produced from seedlings (perennial crops). Wide range of varieties is available in Croatia. Quality of seedlings is sometimes questionable. High quality and virus tested and virus free seedlings are rare and too expansive for small farmers.

2.6 Production technology

Among the Balkan countries, Croatia is one of the countries that invests the most into soft fruit production, which is evident from the wide-spread irrigation systems, which can be hardly seen in Serbia or Bulgaria, etc.

Strawberry

Strawberry has three major types of production technology in Croatia:

1. Open field
2. Tunnel
3. Greenhouse (3-4 ha; less than 1% of total strawberry production area)

Intensive strawberry production in Croatia is based on the use of cold stored runner plants ('frigo' - F) which are planted in open fields. Planting of these plants is carried out during the summer season in double rows using black plastic mulch and a drip - fertigation system. Production is based mainly on short day varieties (Marmolada, Miss, Madeleine, Clery, Maya, Albe etc.) In such a production system the strawberry plants bear fruit in the spring of the following year. Overproduction of strawberries at the end of May and at the beginning of June decreases the price, while a deficit in supply occurs during the

summer season. The interest for producers and the market is how to expand the production season and how to respond to increased demand during the tourist season.

Recently, cold stored tray plants have played a more significant role in out of season strawberry production in the Republic of Croatia. This type of plant is particularly used in soilless production systems

TP have many advantages compared to frigo plants. For example, the plants can have less disease, higher yielding potential and a higher percentage of big fruit. In Northern Europe, the strawberry harvest season can be earlier or later compared to normal open field production. The supply of fruit is extended over a longer period, if cold stored tray plants are used. Wide use of TP in production in open fields and in greenhouses is expected.

Example of family farm producing strawberries based on the research of "Influence of Different Technologies on the Competitiveness of Strawberry Production in Croatia" by Jasna ČAČIĆ, Miroslav TRATNIK, Dražen ČAČIĆ, Dragan KOVAČEVIĆ:

"Strawberry production technology in Croatia the research is based on two-year, two-row growing of strawberries that are obtained from fresh green plants on the plastic mulch. The surveys were conducted on five farms in Zagreb County for the strawberry cultivar Elsanta. In the area of Zagreb County. Average quantity of plants per hectare amounts to 37,000. Space between the plastic mulch is 1.2 m, while on the plastic mulch there are two rows with space between plants 25 cm x 25 cm. Strawberries are planted manually, in the beginning of August, and the strawberry production lasts two years. Strawberry harvest is carried out manually, without truck. The picking on the researched farms was carried out by using producer's and seasonal work. Average use of working hours amounted to 2,155, out of which number 470 hours were of producer's labour, and 1,685 hours were of hired labour. Average result of worker amounts to 10 kg strawberry per hour. Average yield per plant was 0.46 kg, and average yield per hectare was 15,900 kg.

The two-year two-row strawberry production is at the very boundary of competitiveness. The production is completely subject to the market. The fact that strawberry production is at the very boundary of competitiveness means there is no need for significant support in order to achieve competitiveness. If the one-year production technology, common in Germany, is applied in Croatian strawberry production, the production can become very competitive."

There is a trend to move from open production to protected environment, mostly tunnels, to better manage weather risks such as lot of rain and low temperatures in the growing season.

Greenhouses are not common in Croatia. In addition to being vey investment intensive, the much snow in winter time can cause a lot of damage, which deters investment.

Strawberry

Table 5	Yield of strawberry production under different technology
Technology	**Average yield**
Greenhouse	100 tons / ha (1 kg/plant; 10 plants /square m)
Plastic tunnels	20-25 tons /ha
Small producer	10-15 tons / ha
Hobby producer with plants of 3 years	5 tons /ha

Table 6	Fruit weight depending on age of plant
Age of plant	**Weight/fruit**
1st year	17-20 gram
2nd year	13-14 gram
3rd year	10 gram or less

While third year plant produce fruit with the least weight, if production is set that fruit arrives 2 weeks earlier than the rest on the market, operations can be still profitable as no investment is needed and there is hardly any risk.

Blackberry

There are three main blackberry producers in eco production in Croatia: with 5.2 ha, 4.8 ha and with 3.4 ha of blackberry production respectively.

The plants of the interviewed farmer are 13 years old. Blackberry plants are replaced in Croatia when they are about 20 years old, but Nikola will start replacing his plants in batches of 100 next year with a Dutch variety. Due to financial constraints, he cannot replace all plants at the same time. His yield is 10 tons /ha.

Raspberry

Raspberry is produced on open field. As a shallow-rooted plant, raspberry plant requires irrigation in dry periods, which is achieved either by traditional channel irrigation methods or by drip or trickle systems. Raspberry plants require well-drained soils to avoid pathogenic parasites which can lead to root diseases. The use of fertilizers (nitrogen, phosphorus and potassium) and pesticides (insecticides and herbicides) are also required to replace soil nutrients removed at harvest and to control diseases and pests (Challies, 2010). Fresh raspberries are delicate fruit, sensitive to physical damage and bruising and vulnerable to temperature induced denaturation. Because of that, harvesting and post-harvesting grading and packing are labour-intensive activities. The visited Fragaria has 4 ha of raspberry for export for out of season.

2.7 Ecological production

There is increasing customer preference for ecological grown products in Croatia. Market segments with high purchasing power are looking for products that contributes to their healthy lifestyle. However, the

ecological production in Croatia is still in infancy. The total ecological production area id 150 ha and growing every year. There is about 50 ha of ecologically grown blackberry, 20 ha raspberry, 20-25 ha blue berry and 100 ha Aronia.

80% of eco market is Zagreb. The substantial growth rate is due to the introduced incentive system 3 years ago: support had grown from 2800 kuna/ha, to 6800 kuna/ha.

Table 7	Increase in organic production
Year	**Covered area**
2013	43 000 ha
2012	32 000 ha
2011	26 000 ha

In case of conventional arable land, the support given is 2000 to 5000 HRK/ha.

The midterm goal for Croatia is to achieve 80 000 ha under organic production, out of which orchard is 3000 ha. Out of the 1 million ha of conventional production, there is 30 000 ha orchard.

The value of annual consumption of organic produce in Croatia is 400 000 000 kuna, and most of it is import. 3 years ago the this value was merely HRK 5 000 000; the growth curve is very steep. As comparison, the value of annual consumption of organic produce in Berlin is 3 billion kuna/year.

2.8 Harvesting and post-harvest management

The magnitude of postharvest losses is largely influenced by the environmental conditions such as temperature and relative humidity in which they are kept after harvest and also depends on fruit crop. In strawberry production, the interviewed farmers recalled 2% loss in good year, 5-10% in bad year.

According to Fragaria, post-harvest treatment is very important. Strawberry can lose a lot of its quality in 2-3 hours after harvest. There is a 5-7% loss up to two hours. After 2-3 hours, quality deteriorates exponentially. Therefore, it is necessary that strawberries enter the cold chain within 2-3 hours after harvest.

Blackberry can be left for 2-3 days after harvest and can handle transport very well. Strawberry needs to reach the market within 1 day and cannot handle transport.

2.9 Cost of production

The major bought-in inputs for soft fruit production are plant materials, fertilisers and agrochemicals. Fertilizers and agrochemicals are more costly than abroad.

Currently, Croatia is not competitive enough in terms of costs of production comparing to the big strawberry producers such as Spain, Poland, Turkey.

Table 8	Comparison of cost of production in Croatia using different technology, strawberry
Technology	**Cost of production / kg**
Open field	more than EUR 1
Protective environment	EUR 1.5

In Spain, the cost of production of strawberry is less than 1 euro, which is due to economies of scale: farmers can buy plant materials and other inputs at cheaper price than Croatian farmers who have much smaller land, and most of the time not organized in producer groups. The ideal farm size is around 2-300 ha to be able to take advantage of economies of scale, which is possible in Croatia only if farmers get organized.

The visited Fragaria defined 450 gr fruit / strawberry plant as break-even point.

According to one of our interviewed farmers gas prices went up 3000% in the last 10 year, price of water and other inputs keep going up while price of strawberry stays the same for the last 15 years. In terms of impact on profitability that means 50% decrease. Labour used to be 10 kuna / hour, now it is 20 kuna. It is only thanks to own improvement in production technology that family can still manage cost increase.

Indication of production costs for the above mentioned family farm

The family has 1 ha of production: 1/3 year of it is 1st year plants; 1/3 of it is 2nd year; 1/3 of it is 3rd year. They have extra land to be able to rotate production.

- Grade A minus plant costs- 1.9 euro, grade A plant costs 1.95 euro; grade A plus plant cost 2 euro
- 30-40,000 plants / ha are planted generally. As soil is very dry, lot of water is needed; family is planting only 30,000 / ha and they use+ irrigation
- Of the total costs, plant material represents about 50%;
- For labour, 10 people / ha is needed, but labour is not calculated by farmer as input costs, as it comes from family.

Input production costs for the visited blackberry wine producing farm

In case of the blackberry, the interviewed farmer has the plant production and wine production operations. The cost of plant production combined with the wine production is much less comparing to the expenses incurred with the transportation of the wine in bottles to interested retailers engaged in tourisms, since these are hotels and small souvenir shop; their demand is relatively small, and they are spread across the country.

- The Dutch plant material is costs 2.5 euro in the Netherlands. By the time it reaches Croatia, it becomes EUR 8.5
- Fertilizer: EUR 1000 for 5 applications throughout the year
- Bottle for yearly wine production: 7000 euro
- Labour EUR 1300 / year
- Transport EUR 3500 (diesel: 9.5 kuna / l; he drives 45,000 km)

In the Appendix, please find gross margin calculations for berry fruit production in Croatia.

2.10 Quality control

Main export fruits for Croatia are mandarin and strawberries. Companies producing for the export market have been already working with GlobalGap. As Fragaria export strawberries they also had to introduce GlobalGap 4 years ago.

Some of the producers are preparing for GlobalGap, but awareness raising and capacity building, are needed. Currently supermarkets in Croatia do not require GlobalGap certification, but it is likely to change in the future. Also, to be able to sell on the domestic green market, there is no need to obtain any certificates yet. Processing industry

2.11 Processing

Fruit and vegetable processing is one of the weakest points in the food industry, because of the insufficient production of fresh fruits and vegetables, in spite of good climate and production conditions, as well as because of problems caused during privatization process and lack of investments.

Strawberry

Processing of local strawberries happens only in small scale, at home to make jam. Processing industries of soft fruit import strawberries from China, Poland and Spain. As more and more supermarkets open every day, more and more processed fruit, including soft fruits, will end up on the shelves there. It is only Fragaria that uses its own strawberries to freeze them in case there is demand for frozen food.

Currently, Croatia cannot compete with other countries in providing soft fruit for the domestic processing industries because of lack of economies of scale, therefore, the high production costs and lack of stable climate. As result market price of strawberries are high comparing to imported ones.

Blackberry

In case of blackberries, only 1.5 tons can be put on the market in Croatia as fresh fruit in one season, the rest is processed into wine and other products

The biggest blackberry producer in Croatia has 4 ha of production. He hardly sells the fresh fruit, as price is not attractive enough. I kg of fresh fruits currently sells at HRK 20 on the fresh market. He can sell 1 bottle of wine (0.75 l) for HRK 50. He processes most of the fruits into wine and sell the wine to retailers targeting the tourist market.

Another blackberry grower exports blackberry juice to Sweden.

Aronia

The ecologically produced fruit is processed into 3000 l juice, and sold to pharmacy. The plants are still young, only 2 years; and produce only 5 ton/ha. 1kg of fruits is needed to make 0.8 l juice.

3 Demand

3.1 Soft fruit export / import

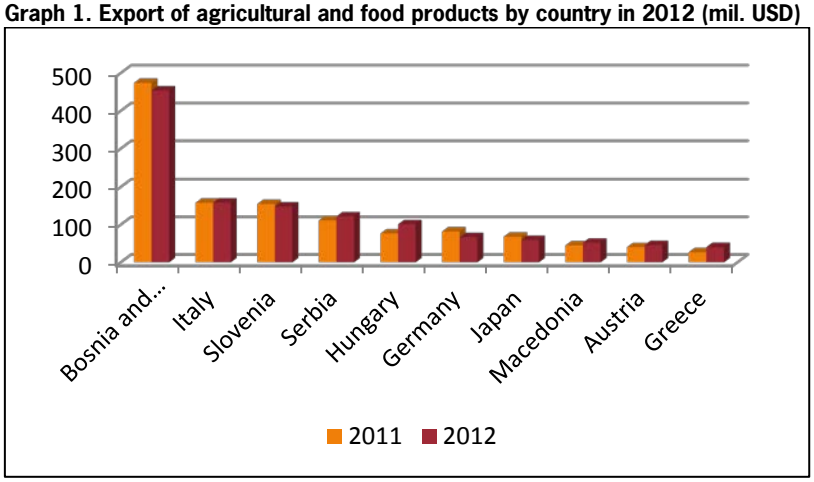
In the year 2012, total import of agricultural and food products was 2,011 thousand tons and USD 2,532 million. In the same year export was USD 1,593 million and 3,088 thousands tones.

Croatia exports mainly to neighbouring countries, especially Bosnia and Herzegovina, Italy, Slovenia and Serbia.

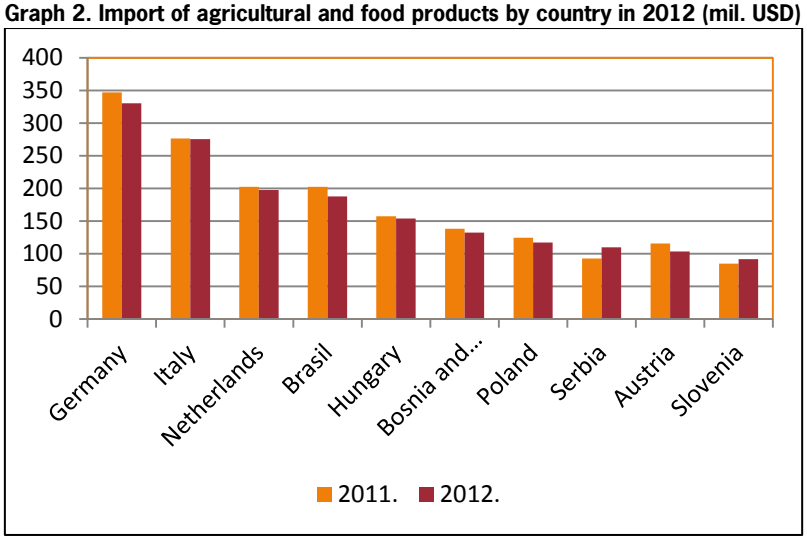
Major agricultural products are cereals, seeds, tangerines, tobacco, medicinal herbs and honey. In addition to tropical and Mediterranean fruits and coffee, Croatia imports significant amounts of live pigs, cattle, cocoa and oil crops.

Food products account for 74% of total Croatian exports of agricultural and food products.

Graph 1. Export of agricultural and food products by country in 2012 (mil. USD)



Graph 2. Import of agricultural and food products by country in 2012 (mil. USD)



Value of export of strawberries is about 4 times smaller than import (400 000 USD vs. 1705 000 USD) (FaoStat data). Nevertheless, level of exports have been increasing sharply in the period 2000-2011. At the beginning of the 21st century export was almost zero. In the year 2010, export reached 400 k USD and 131 tons of strawberry. According to the same data source gross value of strawberry production in the mentioned year was USD 6.38 million while total production was 2,572 tones. So, Croatia exported about 5% of the produced strawberries and about 6% of the gross value of production. For more data, please refer to the Appendices. Main markets are Germany and Scandinavian countries. There is no official statistical data on export-import numbers for other berry fruits. Export is rather modest but current development in blackberry, raspberry, aronia and blueberry production (organic too) will probably change that trend in the near future.

3.2 Soft fruit domestic market

3.2.1 Consumer preferences

Strawberry

Clearly, price of strawberry is the key factor in purchasing decisions. In the 1980s, strawberry was the food of the rich. Nowadays, prices are acceptable to all layers of society, including the retired people market segment with the least purchasing power.

Price has been quite stable in the last 5 years: price of 500 g strawberry on the open air market was HRK 10; this year, the price is the same. More and more producers started producing strawberry keeping the price at the same level.

Year around availability: in the past, strawberries were available between end of March – end of December. It used to be a seasonal fruit. Now, supermarkets expect year around supply, which means having import from other countries.

One of the big question for the commercially oriented producer is what variety to plant. To take guessing out of the process, the Association of Producers of Zagreb (50 producers) and the Zagreb County Associations (20 producers) organize a strawberry tasting competition once a year. What consumers recognize:

- Aroma (smell of the fruit).
- Ration of sugar to acid (sweetness of fruit).
- Size of fruit: consumers prefer the medium (20 grams). “If I want to buy a big fruit, I will buy a plum”.
- Seasonal fruit; eat it only in May and June (other part of the year eat something else).

The variety “Jolly” became the winner this year.

7-8 years ago customers preferred dark read, nowadays lighter fruits.

Blackberries

In case of wine, the producer checks regularly with his customers what the preference is. Mostly women buy his product who prefer sweet wine. In fact, the only change they would want is even sweeter wine. Packaging seem to satisfy the market demand. The producer has special bottles with printed and handwritten labels.

Aronia

Recently there is growing demand for Aronia juice as the plant is good source of antioxidants and can be process into wine. Production technology is relatively simple and the plant is resistant to diseases and pest.

3.2.2 Channels

Traditionally, fruit and vegetables are bought in open markets and every larger settlement has at least one such place. Although this tradition is still alive and some of the largest open markets in Croatia (Zagreb, Split, etc.) are also big tourist attractions, they are faced with a growing competition from supermarkets.

Out of the 4000 tons of strawberries 50% is sold in the open market in Zagreb, 40% in supermarkets and 10% goes for export.

City markets are still the most important channel for selling berry fruits.

Beside classical city markets, initiative of network of city stands was introduced with the objective of providing access for farmers to market. These stands can be found all over Zagreb, at convenient places for prospective customers, such as tram stops. Farmers do not have to pay for using the stands as they are members of one of the association. They can exhibit and sell their produce at the stands However to be eligible to sell, they cannot have more than 5-10,000 plants. Thanks to this initiatives, soft fruit now can be bought at numerous locations across town. Producers with more plants have to sell to retailers, export, etc.

Development of fruit market have been followed by dramatic changes in procurement procedures by retail chains. Procurement of fresh fruit (and vegetables) changes from truck market and tradition wholesalers to dedicated wholesales or direct connections between farmers and retail chains.

Today retail chains cooperate with larger fruit producers capable to ensure quantity and quality. That way chain in shorter (wholesalers are pushed out of the business) but it put additional pressures on farmers to obtain large quantities of working capital. Retail trade is consolidating rapidly. One major difference between Croatia and the other countries is the region is that the market leader is a domestic retail chain – Konzum. (part of Agrokor concern). Konzum is the leading player with a 29% share of retail value sales in 2012, followed by another domestic grocer, Plodine dd (6%). The third- and fourth-ranked players, Lidl Hrvatska and Kaufland kd, each with a 5% share, are owned by Schwarz Group. Mercator (recently acquired by Agrokor) fell from third to fifth in 2012.

The ecologically produced fruit is processed into 3000 l juice, and sold to pharmacy. The plants are still young, only 2 years; and produce only 5 ton/ha. 1kg of fruits is needed to make 0.8 l juice.

4 SWOT

The interviewed growers mentioned the following challenges for the soft fruit sector in Croatia:

- The main challenge for the soft fruit sector is to how to compete with fruits from other soft fruit producing countries. Serbia, for example, can produce berries cheaper.
- For the introduction of greenhouses the biggest bottleneck is the lack of capital.
- The main opportunity for soft fruit production is to find niche seasons for Croatian soft fruits: Spanish and Italian soft fruit production finishes at the end of April, Germany and Poland production start at the end of May. Croatia could find its niche by ensuring that soft berries get to the market in at the beginning of May.

In addition the researchers identified the following SWOT:

Table 9	**Overview of SWOT**
STRENGHTS - Excellent soil and climate conditions for berry production - Geographical and biological diversity with wild berries - Tradition in strawberry production - Few brands established in soft fruit sector	**WEAKNESSES** - Small and fragmented family farms - Old farmers with low level of education and know-how - Insufficient management and marketing knowledge and project management knowledge (difficulties in application for EU funds and projects) - Lack of land market - Lack of rural finance system; investment and working capital - Underdeveloped seedlings production - Insufficient market infrastructure including postharvest management (cooling and storing places) - Underdeveloped agri-food chain without PO's and cooperatives - Risk management programs are missing or inadequate for soft (fruit) sector
OPPORTUNITITES - Access to EU market - Access to EU funds for agriculture, rural development, R&D - Demand for organically produced soft fruits - Demand from processing industry - Establishing cooperatives and efficient value chain management	**THREATS** - Competitions form EU and globally - Cost competitiveness (Poland, Spain, etc.) - Value added competitiveness (innovative and value added products) - Climate change and lack of irrigation systems - High prices of inputs

The ecologically produced fruit is processed into 3000 l juice, and sold to pharmacy. The plants are still young, only 2 years; and produce only 5 ton/ha. 1kg of fruits is needed to make 0.8 l juice.

5 Opportunities for the Netherlands

- Export to Croatia
  - Plant propagation, plant material: There is high level of knowledge of plant propagation in the Netherlands, which is very much needed in Croatia either in form of plant material or by supporting producers in self-propagation of their plants.
  - New varieties of soft fruit
  - Fertigation system
  - Greenhouse technology
  - Soilless production to support Croatian farmers not having to replace 20-30 years of production only to soil and bags.
  - Pollinators and predators of pests
  - New kinds of fertilizers (for eco production) to expand assortment. Current supply is limited.

- Implementing test for diseases and pests. Already Croatia is sending plant samples to the Netherlands to have them tested for pests and disease. It is much cheaper than having it done in Eastern Europe.

- Knowledge transfer
  - Basic knowledge: Basis training and experience about.
    - PH-level
    - EC-level
    - Water quality
    - Weather
    - Fertilizers
  - In ecological production; Cooperation on development with new advisors in organic production (more consultants are needed and advisors are needed for ecological production)
  - It would be good if companies of inputs could provide quality information for farmers; currently farmers keep calling the university for information, and the faculty might not have the latest information. Extensions office is not up to date though information is available from the internet. Faculty of Pomology from University of Zagreb has been involved in educating of farmers of associations to regarding new varieties, production systems , pest management, etc., but that is not enough.
  - Advantage of using shelters, showed different systems.
  - Climate influence and how to manage it
  - Change to substrate growing would make it possible to produce always in the same area. A substrates growing under shelters would minimise weathers risks and would produce better quality fruits with longer shelf-life, which would put the growers into a better position on the market. Also, it can be done with relatively small amount of money. Knowledge is available, delivery companies as well.
  - Introduction of demonstration plots: the area has many possibilities to set up demonstration areas, which would be possible with a small amount of money and support from delivery companies. Growers would get advice and information on how to improve their farms/companies. This would motivate them to make the next steps in performance improvement. An idea would be to start with a good farmer, who has the motivation and willing to take responsibility to set up a demonstration plot. There is no need for big investment. A cooperation could be set up with companies who have/can deliver the materials and the right knowledge, and develop the corresponding business plan. That way, farmers could learn to earn more profit rather than how to save money.

- Joint investment in processing capacity: Juices, jams, pulp for bakery industry (60 million EUR food pulp is imported currently to Croatia).

- Business match-making in the soft fruit sector between Dutch and Croatian companies, e.g. production and sale of juice and wine made of soft fruits in Croatia.

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List of interviewees

Name	**Institution**
Boris Duralija, PhD, Associate professor	University of Zagreb Faculty of Agriculture, Dept. of Pomology
Damir Kovačić, PhD, University professor	Faculty of Agriculture, Dept. of Marketing
Božica Jakeš	Farmer, strawberry producer
Ivan Miličević	Association for Creative Development Slap /Organic Production Expert
Nikola Petković	Farmer, raspberry and blackberry producer
Stanko Barbarić, MSc	Fragaria ltd, agribusiness company
Andreja Martonja Hitrec	Ministry of Agriculture
Dubravka Bačić	Assistant Agriculture Counsellor Office of the Ministry of Economic Affairs Embassy of the Kingdom of the Netherlands

Appendix 1 – Economic Indicators

General information on Croatia

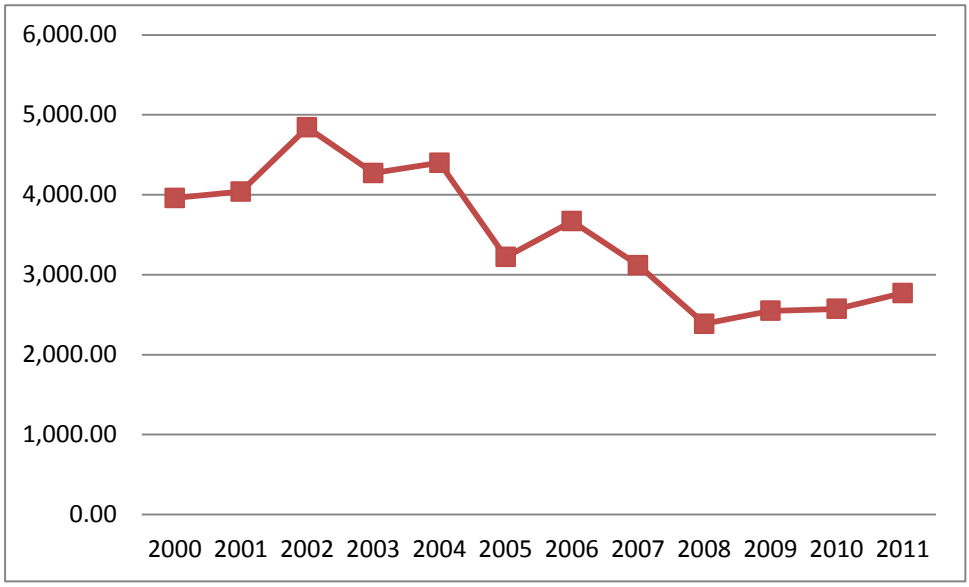
Economic indicators

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Area (square km)	56,538	56,538	56,538	56,538	56,538	56,538	56,538	56,538	56,538	56,538
Population (million)	4.440	4.439	4.442	4.440	4.436	4.434	4.429	4.418	4.280	4.267
GDP (million HRK, current prices)[a]	228,932	247,428	266,652	291,044	318,308	343,412	328,672	323,807	330,171	330,232
GDP (million EUR, current prices)	30,265	33,009	36,034	39,745	43,390	47,543	44,781	44,441	44,412	43,929
GDP per capita (in EUR)	6,816	7,436	8,112	8,951	9,781	10,722	10,111	10,060	10,377	10,295
GDP – real year-on-year rate of growth (in %)	5.4	4.1	4.3	4.9	5.1	2.1	–6.9	–2.3	0.0	–2.0
Average year-on-year inflation rate[b]	1.8	2.1	3.3	3.2	2.9	6.1	2.4	1.1*	2.3	3.4
Current account balance (million EUR)	–1,821	–1,361	–1,899	–2,644	–3,151	–4,255	–2,282	–460.8*	–389.6*	–11.7*
Current account balance (as % of GDP)	–6.0	–4.1	–5.3	–6.7	–7.3	–8.9	–5.1	–1.0	–0.9	0.0
Exports of goods and services (as % of GDP)	43.4	43.1	42.4	42.7	42.1	41.7	36.4	39.9	42.3	43.5
Imports of goods and services (as % of GDP)	50.0	48.9	48.3	49.2	49.3	49.7	39.8	39.8	42.2	42.7
External debt (million EUR, end of year)[c]	19,884	22,933	25,990	29,725	33,721	40,590	45,244	46,483	45,734	44,935
External debt (as % of GDP)	65.7	69.5	72.1	74.8	77.7	85.4	101.0	104.6	103.0	102.3
External debt (as % of exports of goods and services)	151.4	161.1	170.2	175.3	184.6	204.6	277.3	262.4	243.7*	234.9
External debt service (as % of exports of goods and services)[c,d]	21.3	22.5	25.0	37.3	35.1	29.7	46.8	41.9	37.0*	38.8*
Gross international reserves (million EUR, end of year)	6,554	6,436	7,438	8,725	9,307	9,121	10,376	10,660	11,195	11,236
Gross international reserves (in terms of months of imports of goods and services, end of year)	5.2	4.8	5.1	5.4	5.2	4.6	7.0	7.2	7.2	7.2
National currency: Croatian kuna (HRK)										
Exchange rate on 31 December (HRK : 1 EUR)	7.6469	7.6712	7.3756	7.3451	7.3251	7.3244	7.3062	7.3852	7.5304	7.5456
Exchange rate on 31 December (HRK : 1 USD)	6.1185	5.6369	6.2336	5.5784	4.9855	5.1555	5.0893	5.5683	5.8199	5.7268
Average exchange rate (HRK : 1 EUR)	7.5642	7.4957	7.4000	7.3228	7.3360	7.2232	7.3396	7.2862	7.4342	7.5173
Average exchange rate (HRK : 1 USD)	6.7044	6.0312	5.9500	5.8392	5.3660	4.9344	5.2804	5.5000	5.3435	5.8509
Consolidated general government overall fiscal balance (as % of GDP)[e]	–5.4	–4.2	–3.5	–3.4	–3.0	–2.1	–4.6	–5.4	–5.5	–4.0
Public debt (as % of GDP)[f]	35.4	37.6	38.2	35.4	32.9	29.3	35.8	42.6	47.2	53.7
Unemployment rate (ILO, persons above 15 years of age)	14.3	13.8	12.7	11.2	9.6	8.4	9.1	11.8	13.5	15.8
Employment rate (ILO, persons above 15 years of age)	43.1	43.5	43.3	43.6	44.2	44.5	43.3	41.1	39.5	38.1

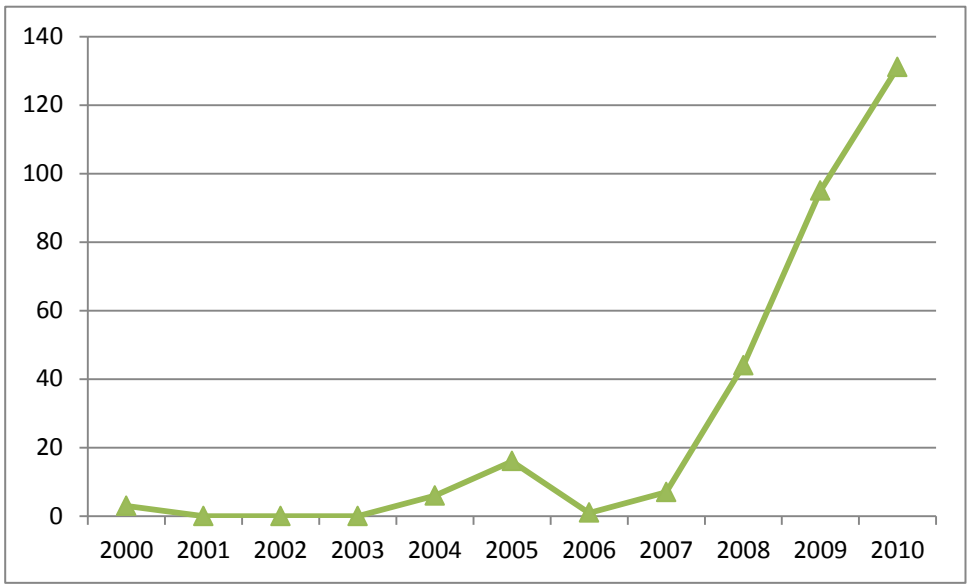
[a] GDP data for 2011 and 2012 are preliminary.
[b] CPI inflation rate.
[c] In accordance with the obligations assumed during the pre-accession negotiations with the European Commission, the new legislative provisions governing the monitoring of foreign borrowing entered into force early in 2008. The external debt balance at end-2007 is reported in accordance with the old system. In order to provide for the comparability of annual data, the external debt is also calculated in accordance with the new system which shows an upward adjustment in the end-2007 balance, increasing it by EUR 365m or to EUR 34,086m. The advanced data processing system is in use since early 2009. For comparability reasons, the external debt balance at end-2008 is also calculated in accordance with the advanced system which shows an upward adjustment in the end-2008 balance, increasing it by EUR 366m or to EUR 40,956m.
[d] Includes principal payments on bonds, long-term trade credits and long-term loans (excluding liabilities to affiliated enterprises), as well as total interest payments net of interest payments on direct investment.
[e] The overall fiscal balance (GFS 2001) in the 1999 - 2001 period is shown on a cash basis and from 2002 on a modified accrual basis. CM, CR, CPF and DAB are included from 2001, but CM has been excluded since 2008. Repayments of debt to pensioners are included in the calculation of the balance (for more details on the methodology of the balance calculation, see Box 4 in CNB Bulletin No. 165). The calculation for 2012 is based on preliminary MoF data.
[f] Public debt is the debt of the general government. From 2008 on, it excludes the debt of CM.

Sources: CBS, MoF and CNB.

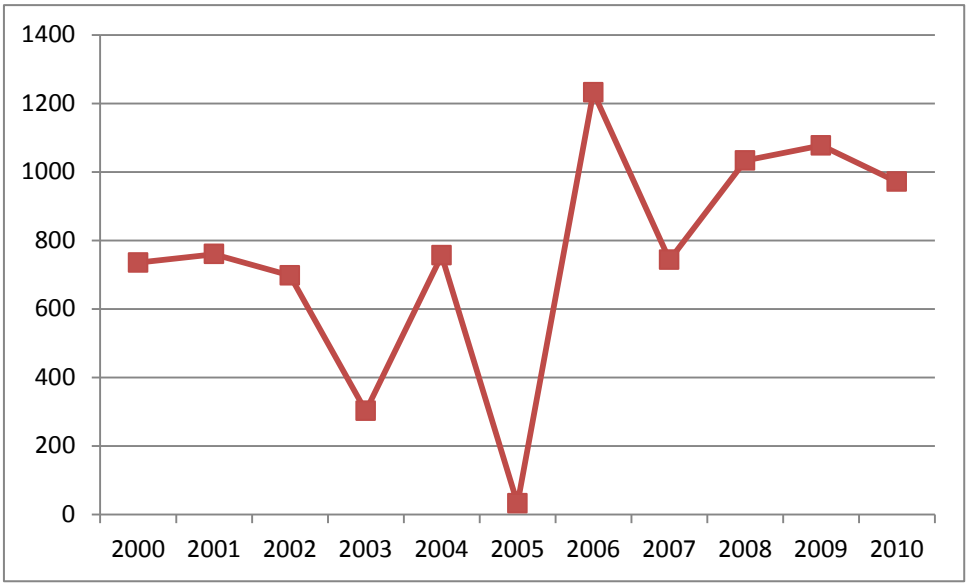
Appendix 2 – Strawberry production in Croatia (t)



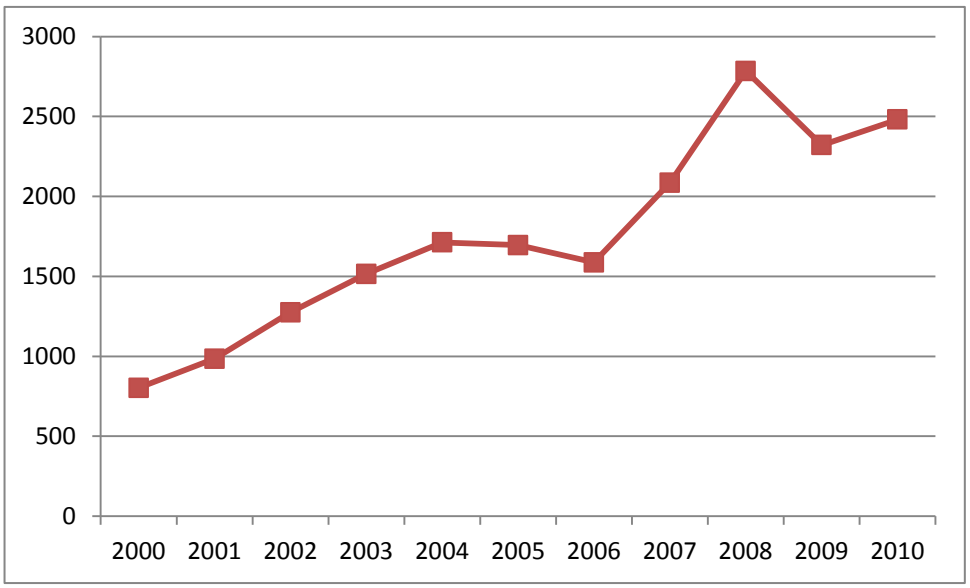
Appendix 3 – Export of strawberry (t)



Appendix 4 – Import of strawberry (t)



Appendix 5 – Farmgate price (USD/t)



Appendix 6 – Gross margin calculations

Blueberry					
Region: Continental			**Area:** 1 ha		7.50
No of trees/ha:	3,000		**Tree density:** 2,7 x 1,2 m		
Production life: years			**Age of the orchard: full capacity**		
Cultivation shape: shrub			**Rootstock: own root**		
			Direct payment/ha	HRK (kuna)	2,100.00

Gross margin calculation					*HRK/ha*	*EUR/ha*
Yield, kg/ha					15,000	
Price, 1 kg					40.00	5.33
Revenues					**600,000.00**	**80,000.00**
Fertilizers					2,588.52	345.14
Plant protection material					1,200.00	160.00
Wooden boxes	5.0	kg/kom	3.00	HRK/kom	9,000.00	1,200.00
Small boxes	0.25	kg/kom	0.15	HRK/kom	2,700.00	360.00
Small boxes	0.125	kg/kom	0.12	HRK/kom	10,080.00	1,344.00
Harvesting	4.0	kg/h	25.00	HRK/h	93,750.00	12,500.00
Pruning	200	h	35.00	HRK/h	7,000.00	933.33
Other costs*					1,500.00	200.00
Total variable costs					**127,818.52**	**17,042.47**

Gross margin	**472,181.48**	**62,957.53**
Machinery costs (own machinery)	3,471.67	462.89
Income	**468,709.81**	**62,494.64**

**cooling on 7°C i storing*

Aronia

Region: Continental
Area: 1 ha
No of trees/ha: 2,000
Tree density: 3,00 x 1,75 m
Production life: 20 years
Age of the orchard: full capacity
Cultivation shape: shrub
Rootstock: own root
Direct payment/ha 2,100.00 kn

Gross margin calculation					*HRK/ha*	*EUR/ha*
Yield, kg/ha					8,000	
Price, 1 kg					50.00	6.67
Revenues					**400,000.00**	**53,333.33**
Fertilizers					2,312.40	308.32
Plant protection material*					1,000.00	133.33
Wooden boxes	5	kg/kom	3.00	HRK/kom	1,440.00	192.00
Small boxes	0.25	kg/kom	0.15	HRK/kom	4,800.00	640.00
Small boxes	0.13	kg/kom	0.12	HRK/kom	5,376.00	716.80
Harvesting	6	kg/h	25.00	HRK/h	33,333.33	4,444.44
Pruning	200	h	35.00	HRK/h	7,000.00	933.33
Other costs*					2,000.00	266.67
Total variable costs					**57,261.73**	**7,634.90**

Gross margin	**342,738.27**	**45,698.44**
Machinery costs (own machinery)	3,687.54	491.67
Income	**339,050.73**	**45,206.76**

** herbicides and rodentcides*

***cooling on 7°C i storing*

Strawberry

Regija: kontinentalna
No of seedlings/ha: 40,000
Trajnost nasada: 2 years
planting: July-August

Area: 1 ha
Density: two rows, 30 x 30 cm
Seedlings class: A
Direct payment (ha): 2,100.00 kn

Gross margin calculation					*HRK/ha*	*EUR/ha*
Yield, kg/ha					24,200	
Price, 1 kg					12.00	1.60
Revenues					**290,400.00**	**38,720.00**
Seedlings (1.g)	40000	kom	1.80	HRK/kom	72,000.00	9,600.00
Machinery (1.g)	1	ha	2000	HRK/ha	2,000.00	266.67
Folia (1.g)	400	m	30.00	HRK/kg	12,000.00	1,600.00
Irrigation pipes.*	280	m	20.00	HRK/m	5,600.00	746.67
Irrigation pipes**	12000	m	0.50	HRK/m	6,000.00	800.00
Planting(1.g)	220	h	20.00	HRK/h	4,400.00	586.67
Manures(1.g)	40	t	150.00	HRK/t	6,000.00	800.00
Fertilizers (1.g)					5,538.79	738.51

1.g.= 1st year
2.g.= 2nd year

Fertilizers (2.g)					3,760.00	501.33
Plant protection material					19,538.90	2,605.19
Wooden boxes	0.5	kg/kom	0.30	HRKkom	14,520.00	1,936.00
Small boxes	5	kg/kom	3.00	HRK/kom	14,520.00	1,936.00
Harvesting	15	kg/h	20.00	HRK/h	32,266.67	4,302.22
Cleaning	200	h	20.00	HRK/h	4,000.00	533.33
Other costs					2,000.00	266.67
Total variable costs 1st year					**200,384.36**	**26,717.91**
Gross margin 1st year					**90,015.64**	**12,002.09**
Machinery costs (own machinery)					2,700.97	360.13
Total variable costs 2nd year					**90,605.57**	**12,080.74**
Gross margin 2nd year					**199,794.43**	**26,639.26**
Machinery costs (own machinery)					1,355.07	180.68
Gross margin (average 1st and 2nd year)					**144,905.04**	**19,320.67**
Income 1st year					**87,314.67**	**11,641.96**
Income 2nd year					**198,439.37**	**26,458.58**

** 63 mm, 4 bars, (1. god)* *** drop-by-drop (1.god)*

Blackberry

Region: Continental
No of trees/ha: 2,800
Production life: 15 years
Cultivation shape: "on the wire"

Area: 1 ha
Tree density: 2,7 x 1,3 m
Age of the orchard: full capacity
Rootstock: own root
Direct payment/ha 2,100.00 HRK

Gross margin calculation					*HRK/ha*	*EUR/ha*
Yield, kg/ha					15,000	
Price, 1 kg					10.00	1.33
Revenues					**150,000.00**	**20,000.00**
Fertilizers					1,903.00	253.73
Plant protection material					8,509.38	1,134.58
Boxes	8	kg/kom	4.40	HRK/kom	8,250.00	1,100.00
Harvesting	10	kg/h	20.00	HRK/h	30,000.00	4,000.00
Pruning	180	h	20.00	HRK/h	3,600.00	480.00
Other costs					1,000.00	133.33
Total variable costs					**53,262.38**	**7,101.65**
Gross margin					**96,737.63**	**12,898.35**
Machinery costs (own machinery)					3,684.71	491.29
Income					**93,052.92**	**12,407.06**

Raspberry

Region: Continental
Area: 1 ha
No of trees/ha: 2,800
Tree density: 2,8x0,4 m
Production life: 12 years
Age of the orchard: full capacity
Cultivation shape: "on the wire"
Rootstock: own root
Direct payment/ha 2,100.00 HRK

Gross margin					*HRK/ha*	*EUR/ha*
Yield, kg/ha					12,000	
Price, 1 kg					10.00	1.33
Revenues					**120,000.00**	**16,000.00**
Fertilizers					1,903.17	253.76
Plant protection material					8,509.38	1,134.58
Boxes	8	kg/kom	4.40	HRK/kom	6,600.00	880.00
Harvesting	8	kg/h	20.00	HRK/h	30,000.00	4,000.00
Pruning	180	h	20.00	HRK/h	3,600.00	480.00
Other costs					1,500.00	200.00
Total variable costs					**52,112.55**	**6,948.34**
Gross margin					**67,887.46**	**9,051.66**
Machinery costs (own machinery)					3,632.41	484.32
Income					**64,255.04**	**8,567.34**

Assessment of the Soft Fruit Sector, Croatia. This report has been developed on the request of the Royal Dutch Embassy in Zagreb to contribute to enhancing the oft fruit sector in Croatia.

More information: www.wageningenUR.nl/cdi

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