1. GENERAL DESCRIPTION OF OLIVE GROWING IN CROATIA

1.1. Introduction

Figure 1. Location of Croatia (Source: UN)

Olive growing in Croatia is limited to the Dalmatian Coast and Islands, as well as Istria and Primorje-Gorski Kotar. It is characterised by a large number of small-scale producers and a high proportion of extensive orchards. On average, olive holdings are less than 1 ha in size; only 20% are more than 2 ha although medium-scale growers are starting to emerge. Investment in new orchards has come largely from olive oil processors and a few large-scale producers. At primary production level, technology varies a lot depending on the type of producer. Small producers still carry out most of the operations traditionally by hand whereas bigger farms are more mechanised. In 2010, the olive sector accounted for 1.5% of Croatia's final agricultural production.

The olive sector generates 150 workdays/ ha, of which 130 in olive growing and 20 in the olive oil/table olive industry. (Source: IOC questionnaire)

1.2. Socio-economic indicators

- **Area: 56 594 sq km (UN, 2008)**
- **Capital city: Zagreb (UN)**
- **Currency: Kuna (HRK) (UN, 2009)**
- **Population: 4 416 (World Bank, 2009)**
- **Urban population: 57.7% (UN, 2010)**
- **Rural population: 42.3% (UN, 2010)**
- **Population growth rate: –0.2% (UN, 2010/15)**
- **Life expectancy: 73.8 years (men), 80.4 years (women) (UN, 2010/15)**
- **Main exports by quantity: maize, wheat and refined sugar (FAOSTAT, 2009)**
- **Main imports by quantity: soybean cake and sugar beet (FAOSTAT, 2009)**
- **GNI per capita, PPP (current international $): 18 860 (World Bank, 2010)**
- **GDP per capita, PPP (current international $): 13 754 (World Bank, 2010)**
- **Employment in agriculture: 13.9% (World Bank, 2009)**
- **Employees in agriculture, female: 15% (World Bank, 2009)**
- **Employees in agriculture, male: 13% (World Bank, 2009)**
- **Employment in olive growing: 150 workdays/ha (IOC, 2009/10 data)**

2. BACKGROUND DATA

2.1. Olive oils

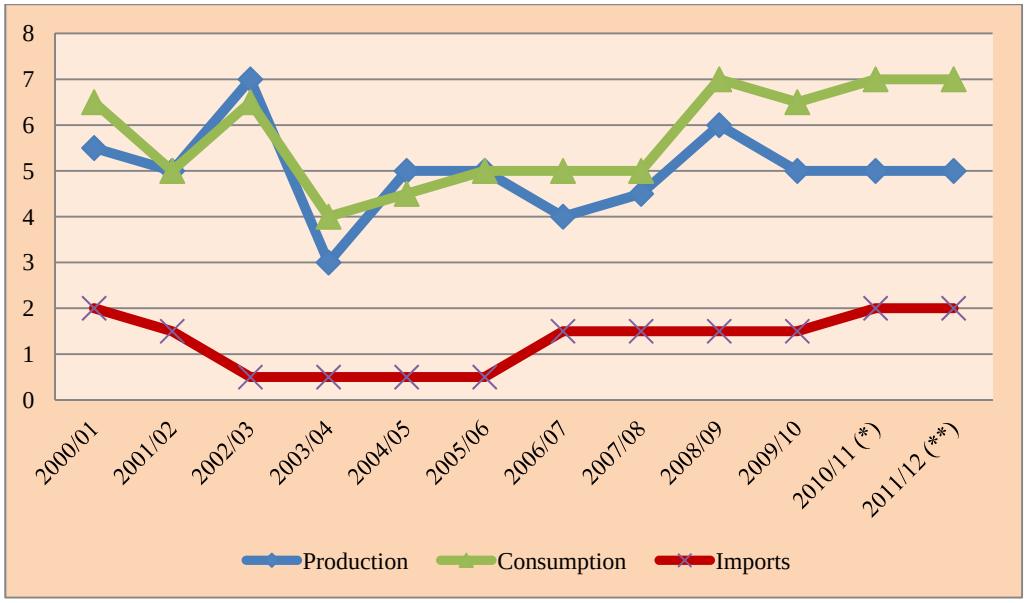


Figure 2. Olive oil production, consumption and imports 1990–2012 (1 000 tonnes)
* Estimates
** Forecasts (Source: IOC)

Table 1.Olive oils (1 000 tonnes) (Source: http://www.internationaloliveoil.org/estaticos/view/131-world-olive-oil-figures)

	2000/01	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*
Production	5.5	5.0	7.0	3.0	5.0	5.0	4.0	4.5	6.0	5.0
Consumption	6.5	5.0	6.5	4.0	4.5	5.0	5.0	5.0	7.0	6.5
Imports	2.0	1.5	0.5	0.5	0.5	0.5	1.5	1.5	1.5	1.5

2.2. Table olives

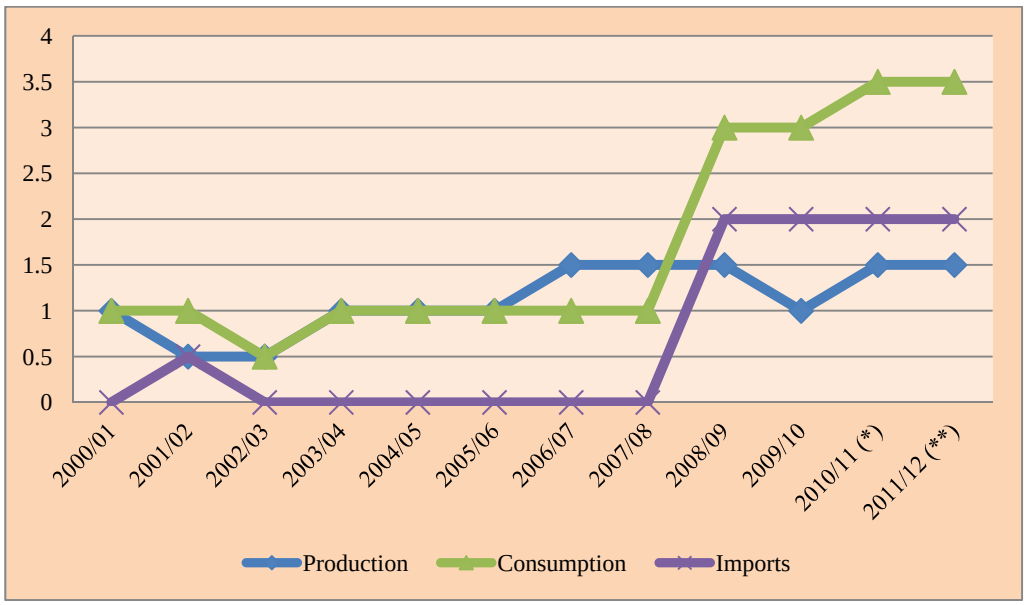


Figure 3. Table olive production, consumption and imports 1990–2012 (1 000 tonnes)
* Estimates
** Forecasts (Source: IOC)

Table 2.Table olives (1 000 tonnes) (Source: http://www.internationaloliveoil.org/estaticos/view/132-world-table-olive-figures)

	2000/01	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*
Production	1.0	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	1.0
Consumption	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	3.0	3.0
Imports	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0

2.3. Total area planted

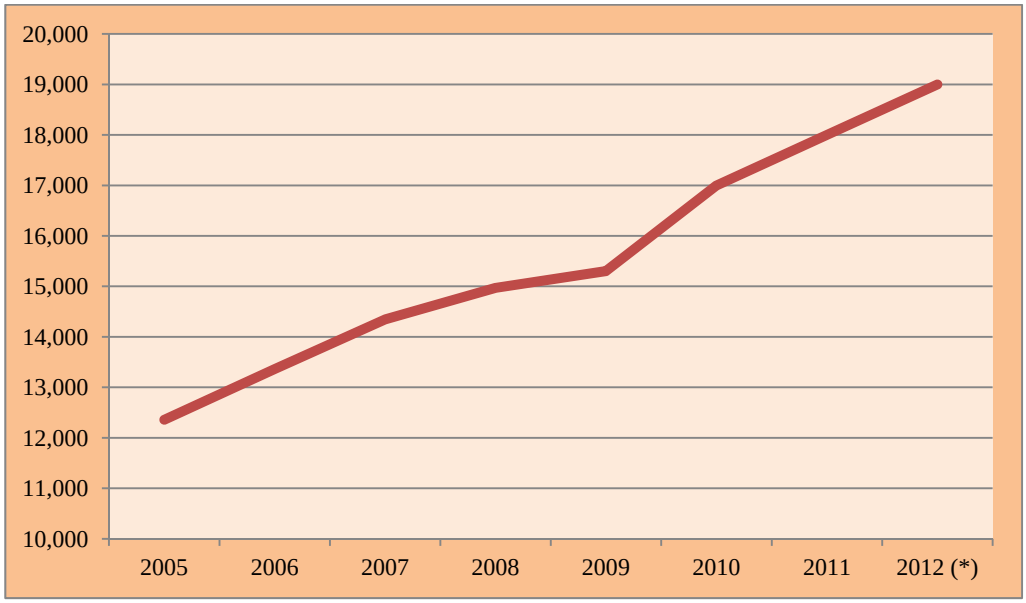


Figure 4. Changes in area planted with olive trees (ha) * Estimates (Source: IOC QUESTIONNAIRE)

3. OLIVE INDUSTRY IN CROATIA

3.1. Historical background

The olive oil from what is now Croatia was reputed for its quality in Roman times. During the Second World War, the number of olive trees was several times higher than today, but a period ensued where olive groves were destroyed and production stagnated. This lasted until about 15 years ago when the sector started to recover, amongst other things through systematic State aid programmes. Direct on-farm consumption and direct sales on family farms still account for a large proportion of all the olive oil produced (6 000 t on average). The upward trend of production has also been driven by increased consumer awareness of the health and nutritional benefits of olive oil, especially in recent years.

Most of Croatia's olive oil is produced from the native Oblica variety, but other domestic and foreign varieties are also grown. (Source: Ministry of Agriculture, Croatia).

3.2. Orchard resources

Between 2005 and 2012, total olive crop area expanded quite significantly from 12 357 ha to 19 000 ha.

In 2009, the benchmark year used in the IOC questionnaire, olive trees were grown on 15 304 ha in Croatia, of which 400 ha comprised new plantings of olives for table production and 600 ha of trees for oil production. Olive orchards were dry farmed on 11 694 ha and irrigated on 3 610 ha.

As can be seen from Table 3, olives were grown on 33 967 agricultural holdings, mostly on an area of less than 1 ha.

Table 3. Number of agricultural holdings growing olive trees in 2009 (Source: IOC questionnaire)

Olive crop area on holding	No of holdings	Total olive crop area (ha)
< 1 ha	33 000	10 497
1– 5 ha	930	2 500
6–10 ha	15	100
11–20 ha	10	1 150
21–50 ha	2	57
> 50 ha	10	2 000
Total	**33 967**	**15 304**

Orchards growing oil-olives under dry-farmed conditions have an average density of 170 trees/ha and 220 trees/ha in the case of table olives. Orchard density in irrigated orchards averages 280–300 trees/ha irrespective of whether they are for oil or table olive production.

The percentage breakdown of olive orchards by age reveals that:

- 49% (7 499 ha) are more than 50 years old;
- 6% (918 ha) are between 5 and 15 years old;
- 30% (4 591 ha) are between 16 and 50 years old; and
- 15% (2 296 ha) are under 5 years old.

Thirty-five percent of the crop area (5 950 ha) is suitable for full mechanisation of cultural practices and harvesting and another 35% (5 950 ha) can be partially mechanised, but mechanisation is not possible at all on the remaining 30% (5 100 ha)**.** (Source: IOC questionnaire)

3.3. Varieties

The varietal heritage of Croatia is chiefly made up of the following varieties:

Lastovka

This variety is of medium hardiness. It has a high rooting ability and flowers early. It is self-incompatible and has a low pistil abortion rate. Ripening is late. Its start of bearing is intermediate, and its productivity is high and constant. The fruit has a high removal force and gives a medium oil yield of approximately 20%.

Levantinka

This Dalmatian variety is found in particular on the island of Solta. The tree is characterised by its spherical, dense canopy. It prefers deep, fertile soils in sheltered areas. It has a very low rooting ability.

It is self-compatible and is also used as a polliniser for the Oblica variety.

In areas conducive to olive cultivation it comes into bearing early. Its productivity is high and constant. The fruit is arranged in clusters and ripens very late. It has a low oil content and is very sensitive to low temperatures and drought.

Oblica

This variety is hardy and adapts readily to agriculturally poor soils. It has a high rooting ability. Its start of bearing is intermediate and it flowers early. The pollen has a low germination capacity. It is self-incompatible, which means that pollinisers such as Levantinka or Drobnica are needed in the orchards. It has a high pistil abortion rate.

Its productivity is medium and alternate. The fruit ripens early. It is suitable for green or black pickling or oil production and it gives an oil that is highly rated. It has a medium oil content and it is freestone.

It shows good resistance to drought but does not tolerate spring cold. It is susceptible to attacks from olive fly but very resistant to *Cercospora cladosporioides*.

(Source: World Catalogue of Olive Varieties, IOC)

3.4. Production and yield

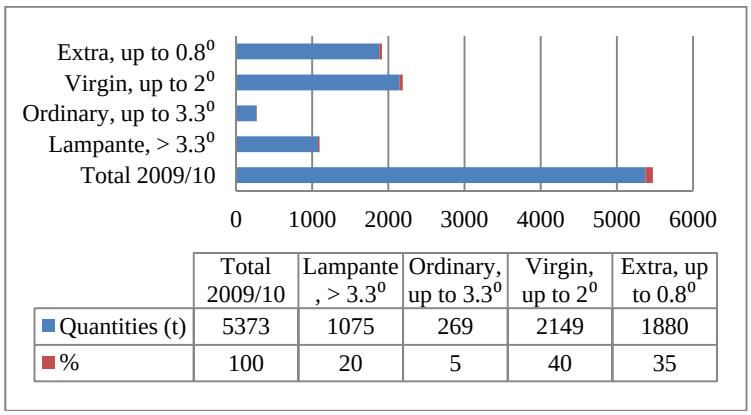
Between 2000/01 and 2009/10 Croatia's olive oil production averaged 5 000 t/crop year, although it varied from season to season due to the alternate crop bearing pattern of the olive, ranging between a high of 7 000 t in 2002/03 and a low of 3 000 t in 2003/04 (Table 1). Production of table olives has also varied, albeit on a smaller scale, ranging between 500 t and 1 500 t (Table 2), with the average for the last decade working out at 1 050 t /year.

In recent years, production of organic olive oil has been on the rise in Croatia, increasing from 20 t in 2004/05 to 735 t in 2009/10. Non-organic virgin olive oil production has gone up from 10 t to 500 t over the same crop years. According to estimates, Croatia expects to produce 780 t of organic olive oil in 2011/12 compared with 520 t of non-organic virgin olive oils.

In conventional orchards, green table olives are the preponderant type produced in Croatia, accounting for 52.3% (680 t) of production in 2009/10, followed by black olives with a 47.69% (620 t) share. When speaking of organic orchards, 48.27% of production goes for green table olives and 51.72% for black table olives.

Crop production yields in conventional orchards worked out at 2 300 kg/ha for oil-olives and 2 700 kg/ha for table olives in 2009/10. In the case of organic orchards, yields averaged 3 700 kg for oil-olives and 3 000 kg for table olives in the same season. (Source: IOC questionnaire)

3.5. Processing sector



	Total 2009/10	Lampante, > 3.3⁰	Ordinary, up to 3.3⁰	Virgin, up to 2⁰	Extra, up to 0.8⁰
Quantities (t)	5373	1075	269	2149	1880
%	100	20	5	40	35

Figure 6. Production of virgin olive oils by grade (Source: IOC questionnaire)

In 2009, there were 149 olive oil processing facilities in the whole of Croatia.

These operated on different extraction systems: 73 were continuous-process facilities with a production capacity of 30 t/8 hr, 33 were presses or super-presses and 43 were traditional mills.

In addition, Croatia has 57 olive oil packing plants with a production capacity of 2.5 t/8 hr.

When broken down by category, 40% of the olive oil produced in 2009/10 was virgin grade, 35% was extra, 20% was lampante and 5% was ordinary grade (with a free acidity of between 2º and 3.3º).

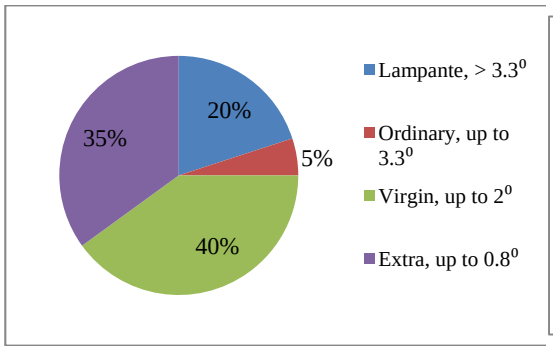


Figure 7. Production of virgin olive oils by grade in 2009/ 10 (Source: IOC questionnaire)

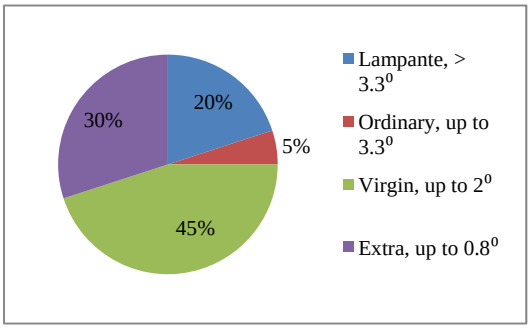


Figure 8. Production of virgin olive oils by grade in 2008/ 09 (Source: IOC questionnaire)

On comparison, the production share of extra virgin olive oil increased by 5% at the expense of the virgin and ordinary categories over 2008/09 and 2009/10.

Croatia has approximately 14 table olive processing and packing plants with an average production capacity of 1.2 t/season/plant. (Source: IOC questionnaire)

3.5. Marketing and domestic consumption

In 2010, Croatia had a per capita consumption of 1.9 kg. Domestic consumption of olive oil averaged 5 500 t over the 2000/01–2009/10 seasons, fluctuating within an interval from 4 000 t (2003/04) to 7 000 t (2008/09) (Table 1).

Itemised by type, 3 672 t of the olive oil consumed in Croatia in 2009/10 were consumed by producer households (own consumption), 2 100 t were used in the food processing industry, 1 429 t were consumed as packed non-organic product, 735 t were virgin olive oils sold loose and 200 t were packed organic virgin olive oil (see table below)

Table 4. TOTAL QUANTITIES OF OLIVE OILS CONSUMED (t) (Source: IOC questionnaire)

Headings	2008/09 crop year	2009/10 crop year
Virgin olive oils consumed by producer households	3 310	3 672
Virgin olive oils sold loose	857	735
Packed organic virgin olive oil	149	200
Packed virgin olive oil (Geographical indications)	0	0
Packed olive oils (conventional)	1 170	1 429
Packed olive-pomace oil	0	0
Olives oils used in the food processing industry	1 540	2 100

Croatia does not produce enough olive oil to meet its requirements and therefore needs to import substantial quantities. During the 2000/01–2009/10 period, it imported 1 550 t/year on average. Italy is the main supplier of Croatian imports, exporting 878 t in the 2010 calendar year.

To give an idea of scale, olive sector exports (olive oils and table olives) accounted for 1.45% of total agricultural exports and imports for 1.15% of total agricultural imports in 2010.

Table olive consumption averaged 1 350 t from 2000/01 to 2009/10. Interestingly, it held more or less steady at 1 000 t through the decade until the last two seasons when it trebled to 3 000 t (Table 2).

3.6. Recent measures

An Operational Olive Planting Programme was launched for 2004–2007 with the goal of establishing 5 500 ha of new olive orchards to learn more about the potential of Croatian olive production (Ministry of Agriculture).

To implement these kinds of programmes and to increase the amount of aid for the olive sector, the Croatian Bank for Reconstruction and Development (HBOR) gives financial loans for agricultural and small businesses in areas of special State concern and for perennial crops.

In July 2008, the Croatian Government adopted amendments to the Operational Programme in order to expand permanent olive orchard acreage between 2008 and 2012. The amendments envisaged the renovation of existing orchards and the establishment of an additional 4 500 ha of olive groves, aimed at making Croatia self-sufficient in olive oil production.

(Source: Eva Perica, Marija Cerjak, Ornella Mikuš, 2010. *Opportunities and potential threats to Croatian olive oil sector in the European Union*)

4. SOURCES

IOC questionnaire

IOC database

http://www.internationaloliveoil.org/estaticos/view/130-survey-and-assessment-division

United Nations

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World Bank

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EUROSTAT

http://epp.eurostat.ec.europa.eu/portal/page/portal/international_trade/data/database

Ministry of Agriculture, Croatia

http://www.mps.hr/default.aspx?id=6261

Eva Perica, Marija Cerjak, Ornella Mikuš, 2010**.** ***Opportunities and potential threats to Croatian olive oil sector in the European Union.*** POMOLOGIA CROATICA. Vol. 16/ 2010, br. 3-4. Original Scientific Paper.