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Deliverable no. 25: Overview of Olive Oil Marketing and Processing and Olive Sector Organisation

INTRODUCTION

This deliverable intends to be a contribution to the study of olive oil marketing and processing and olive oil sector organisation in each of the Olivero Project target areas (Granada – Spain; Potenza – Italy; Crete – Greece and Trás-os-Montes – Portugal).

Two different types of information were used to accomplish the main objective of this deliverable: secondary information and primary information collected trough interviews (interview form in annex). All the Olivero partners were involved in the interviews but only partner 3 (Granada, Spain) and Partner 6 (Portugal) collected secondary information for a broader olive mill characterization.

The structure of this deliverable has two separate parts. The first part consists in a characterization of the olive mills and olive oil production based on secondary information. Information was collected for Trás-os-Montes (Portugal) and Granada (Spain) target areas ending with some comparison between these two regions.

In Granada the number of recognized olive mills decreased from 2001/2 to 2002/3 but increased in 2003/4. In Trás-os-Montes this number decreased from 2000/1 until 2002/3 harvest campaigns considered, but the number of olive mills was higher than in Granada.

The number of traditional olive mills in Granada is lower than the continuous ones but in Trás-os-Montes is higher, although decreasing. In both cases 2 phases olive mills are predominant as well as INOX storage. In Granada 69 % of the olive mills have packing equipment in 2002/3 while in Trás-os-Montes only 18%.

In Granada the average of olives processed and olive oil produced in the three considered campaigns was seven and ten times higher than in Trás-os-Montes, respectively.

The second part consists in a characterization of the olive oil marketing based on interviews made in the four target areas mentioned above. Forty marketing interviews took place in the Olivero target areas: 5 in Granada (Spain), 15 in Potenza (Italy), 11 in Crete (Greece) and 10 in Trás-os-Montes (Portugal).

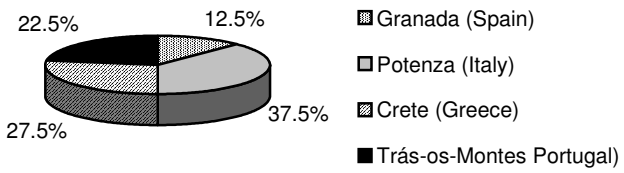


Figure 1: Olive mills sample distribution by country

Due to the small size of the olive mills' sample in each of the four target areas, and the fact that they were not randomly chosen (the objective was to express the regional olive mills diversity) the results of this analysis must be interpreted with caution.

In fact, this sample is not representative of the whole group of countries, and neither each sample in its own country. However the analysis of the interview data allows the identification of different practices regarding processing and marketing.

Considering all the interviews a cluster analysis has been done in order to establish similar groups of olive mills according to their trade and marketing activities. Three clusters were obtained: Cluster 1 - "Production Oriented" olive mills are characterized by not selling packed olive oil, selling all the production to intermediaries or refinery industries. In this cluster are located the larger olive mils in terms of olives processed and olive oil produced. Cluster 2 - "Sales Oriented" olive mills include those olive mills that although marketing packed olive oil don't give emphasis to the trade and marketing activities. The last cluster, Cluster 3 - "Market Oriented" olive mills are characterized by selling packed olive oil, and developing trade and marketing activities all over the year. These olive mills are those closer to the final consumers as most part of their production is sold directly to them and consumers' preferences are taken into account in the production of the olive oil.

In this part a descriptive analysis of the Italian interviews, made by partner no. 4 is also included.

I. OLIVE MILLS AND OLIVE OIL PRODUCTION CHARACTERIZATION BASED ON SECONDARY INFORMATION

TRÁS-OS-MONTES OLIVE MILLS AND OLIVE OIL PRODUCTION CHARACTERIZATION FOR 2000/1 AND 2002/3 HARVESTS CAMPAIGNS.

Partner 6: Departamento de Economia Agrária e Sociologia Rural, (DEASR)
Instituto Superior de Agronomia (ISA), Lisboa
F. Duarte, N. Jones, C. Lúcio and A. Nunes[1]

1. INTRODUCTION

For Trás-os-Montes olive mills and olive oil production characterization and for the 2000/1 to 2002/3 period, two types of information were available: information on existing olive mills and on recognized olive mills that processed olives in those campaigns.

The existing mill information represents all the mills that are registed in INGA[2] database including so, many that are no more in activity. Recognized olive mills are those that INGA recognizes, in each harvest campaign for production aid application. These olive mills have good productive and environmental conditions to operate, previously recognized by the Agricultural Ministry Regional Delegations and ACACSA[3] Institution.

In this analysis only information about recognized olive mills will be considered as it seems the most reliable one. For this group we will show its regional distribution, its legal status, the main technological features, the olives origin and processing fees, olives processed quantity, number of farmers that delivered olives, olive oil obtained and aid amount paid to the farmers according to the olive oil produced.

It is also important to refer that this analysis was made for all municipalities of the four districts (Bragança, Guarda, Vila Real e Viseu) that belong to Trás-os-Montes Agricultural Region. In Bragança and Vila Real, all the municipalities are in Trás-os-Montes Agricultural region, but only one in Guarda and eight in Viseu. The remaining municipalities of these last two districts are integrated in other Agricultural Region.

[1] João Tiago Carapau contributed also to this deliverable and performed the olive mills interviews.
[2] INGA – Instituto Nacional de Intervenção e Garantia Agrícola
[3] ACACSA – Agência de Controlo das Ajudas Comunitárias ao Sector do Azeite

2. TRÁS-OS-MONTES OLIVE MILLS CHARACTERIZATION

2.1 EXISTING AND RECOGNIZED OLIVE MILLS

The period selected was 2000/1 up to 2002/3 harvest campaigns, the most recent data available which results from an annual survey conducted by INGA, compulsory to every recognized mill.

Table 1 shows that the evolution of the existent and recognized olive mills was unequal, in fact the first ones have increased 2 % in this four years' period and the second ones decreased 26%. In 2002/3, the recognized mills represented only 38 % of the existing mills in Trás-os-Montes region.

Table 1 – Existing and recognized Trás-os-Montes olive mills by district

Districts	Existing Olive Mills (n. º)				Recognized Olive Mills (n. º)			
	2000/1	2001/2	2002/3	2003/4	2000/1	2001/2	2002/3	2003/4
Bragança	171	172	176	179	89	78	69	w.i.
Guarda	15	16	16	16	9	9	8	w.i.
Vila Real	63	63	64	63	30	26	19	w.i.
Viseu	44	44	44	44	27	20	18	w.i.
TOTAL	293	295	300	302	155	133	114	w.i.

w.i. – without information.

Two main factors are responsible for this situation: the settlement of new olive mills in the region, that increases the total number of existent olive mills, and the increase of environmental and hygienic-sanitary control that decreases the recognized olive mills number along this three years period.

Information about recognized olive mills was considered the most accurate to characterize olive processing in Trás-os-Montes.

In 2002/3 the number of mills in Trás-os-Montes was 114 (table 2), 60 % were located in Bragança, where almost the whole "Terra Quente" region is included (the main olive oil production zone in Trás-os-Montes).

Table 2 – Share of Trás-os-Montes' recognized olive mills by districts

District	Number of Olive Mills		Share in the Region (%)	
	2000/1	2002/3	2000/1	2002/3
Bragança	89	69	57	60
Guarda	9	8	6	7
Vila Real	30	19	19	17
Viseu	27	18	18	16
TOTAL	155	114	100	100

Trás-os-Montes' olive mills number has decreased 26 % in this period. This reduction was common to all Trás-os-Montes districts, but more clear in Vila Real (-37%) and Viseu (-33%).

Table 3 – Trás-os-Montes' recognized olive mills by district and municipality

District	Municipality	Number of Olive Mills (n. º)		Share in the Region (%)	
		2000/1	2002/3	2000/1	2002/3
Bragança	Alfandega da Fé	4	3	2,58	2,63
	Bragança	7	8	4,51	7,02
	Carrazeda de Ansiães	6	3	3,87	2,63
	Freixo de Espada à Cinta	4	1	2,58	0,88
	Macedo de Cavaleiros	14	10	9,03	8,77
	Miranda do Douro	1	1	0,65	0,88
	Mirandela	21	19	13,54	16,67
	Mogadouro	10	6	6,45	5,26
	Torre de Moncorvo	4	3	2,58	2,63
	Vila Flor	11	10	7,10	8,77
	Vimioso	5	4	3,23	3,51
	Vinhais	2	1	1,29	0,88
Guarda	Vila Nova de Foz Côa	9	8	5,81	7,02
Vila Real	Alijó	4	2	2,58	1,75
	Chaves	1	1	0,65	0,88
	Mesão Frio	0	0	0	0
	Murça	3	1	1,94	0,88
	Peso da Régua	3	2	1,94	1,75
	Sabrosa	2	1	1,29	0,88
	Santa Marta de Penaguião	4	1	2,58	0,88
	Valpaços	11	10	7,10	8,77
	Vila Pouca de Aguiar	0	0	0	0
	Vila Real	2	1	1,29	0,88
Viseu	Armamar	4	2	2,58	1,75
	Lamego	5	3	3,23	2,63
	Moimenta da Beira	3	2	1,94	1,75
	Penedono	1	0	0,65	0
	São João da Pesqueira	9	8	5,81	7,01
	Sernancelhe	1	1	0,65	0,88
	Tabuaco	2	1	1,29	0,88
	Tarouca	2	1	1,29	0,88
	TOTAL	155	114	100	100

A more detailed analysis of Trás-os-Montes municipalities information (table 3) shows that in 2002/3, the seven municipalities with higher number of olive mills were Mirandela with 19; Macedo de Cavaleiros, Vila Flor and Valpaços with 10; and, Bragança, Vila Nova de Foz Côa and São João da Pesqueira with 8. These municipalities represent 64 % of all the regional olive mills. All of these seven municipalities show, in the 2000/1 - 2002/3 period, a decrease in the number of olive mills, excepting Bragança where this number increased, although their share in the region seems to increase.

Despite this global decrease in Trás-os-Montes' olive mills number, the most important municipalities had maintained or reinforced its share in each harvest year. The olive mills' number reduction was more intense in the remaining municipalities, and mostly in Freixo de Espada à Cinta (with 4 mills in 2000/1 and only 1 in 2002/3).

On the following analysis only 154 recognized olive mills have been considered due to missing information about one olive mill (in Vimioso municipality).

2.2 OLIVE MILLS BREAKDOWN BY LEGAL STATUS

The INGA' recognized olive mills database allowed the breakdown by legal status, such as rent, direct management, association, cooperative, other types and without information. The rent status includes olive mills managed by others than their owners; the direct management corresponds to the individual entrepreneur; association mills, have an associative contract of property; cooperative are those managed under the cooperative code; others are those that are not integrated in any of the previous categories (example: olive mills owned by the Portuguese State or are explored by entities connected with it); and a residual category without information, including all the mills with missing information concerning this variable (16 % in 2000/1 and 12 % in 2002/3 of the total Trás-os-Montes authorized mills).

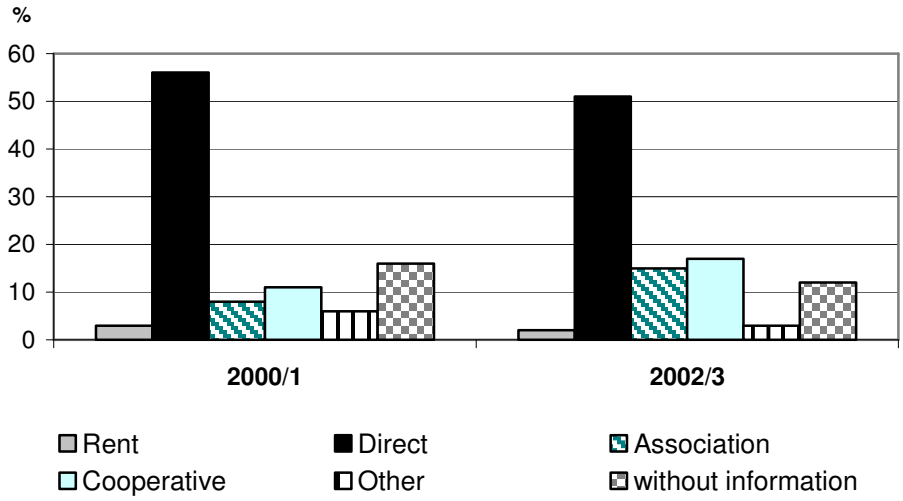
Table 4 – Trás-os-Montes' olive mills by legal status and by district

District			Bragança	Guarda	Vila Real	Viseu	TOTAL
Rent	Nº	2000/1	4	1	0	0	5
		2002/3	1	0	0	1	2
	%	2000/1	80	20	0	0	100
		2002/3	50	0	0	50	100
Direct	Nº	2000/1	53	2	17	13	85
		2002/3	40	1	10	8	59
	%	2000/1	62	2	20	15	100
		2002/3	68	2	17	14	100
Association	Nº	2000/1	8	0	4	1	13
		2002/3	12	0	5	0	17
	%	2000/1	61	0	31	8	100
		2002/3	71	0	29	0	100
Cooperative	Nº	2000/1	8	3	2	4	17
		2002/3	8	4	2	5	19
	%	2000/1	47	18	12	24	100
		2002/3	42	21	11	26	100
Others	Nº	2000/1	4	0	2	3	9
		2002/3	1	0	1	1	3
	%	2000/1	44	0	22	33	100
		2002/3	33	0	33	33	100
Without Information	Nº	2000/1	11	3	5	6	25
		2002/3	7	3	1	3	14
	%	2000/1	44	12	20	24	100
		2002/3	50	21	7	21	100

Figure 1 shows that the most common legal status in 2000/2001 and 2002/3 harvest campaigns was the direct management (more than 50 %). This includes the private

olive mills owned by olive growers producing olive oil for self–consumption and for selling.

Figure 1 – Share of Trás-os-Montes' olive mills by legal status



This figure shows that, in these three harvests campaigns, the share of associative and cooperative mills has increased (8 % to 15 % for the associative olive mills and 11 % to 17 % for the cooperative mills).

2.3 TECHNOLOGICAL CHARACTERIZATION OF OLIVE MILLS

According to the information available, it was possible to define two main types of olive processing technology: traditional extraction mills (press) and continuous extraction mills (table 5).

It was also necessary to add two more classes: the mills that labour with the two types of technology (Both) and those with these information missing in the INGA' Annual Mill surveys[4] (Without information).

Table 5 – Trás-os-Montes olive mills by type of technology and district

District			Bragança	Guarda	Vila Real	Viseu	TOTAL
Press Extraction Olive Mills	Nº	2000/1	61	4	25	22	112
		2002/3	35	4	13	11	63
	%	2000/1	54	4	22	20	100
		2002/3	56	6	21	17	100
Continuous Extraction Olive Mills	Nº	2000/1	26	3	5	5	39
		2002/3	33	3	6	6	48
	%	2000/1	67	7	13	13	100
		2002/3	69	6	13	13	100
Both	Nº	2000/1	1	2	0	0	3
		2002/3	1	1	0	0	2
	%	2000/1	33	67	0	0	100
		2002/3	50	50	0	0	100
Without Information	Nº	2000/1	0	0	0	0	0
		2002/3	0	0	0	1	1
Total Number	Nº	2000/1	88	9	30	27	154
		2002/3	69	8	19	18	114

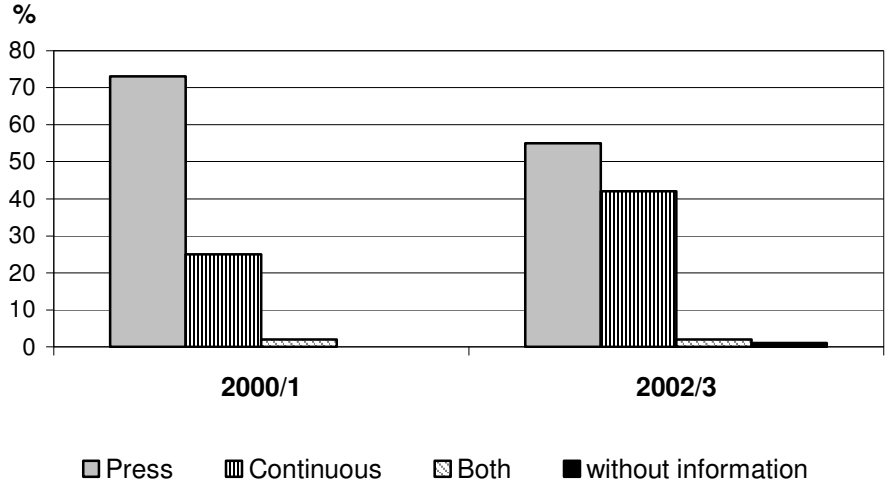
Table 5 shows that it was Bragança that registered the highest number of different technological types of olive mills (56 % of all press mills and 69 % of continuous extraction mills, in the final harvest year). The mills that labour with the two types of technological were 3 in 2000/1 and 2 in 2002/3, and were located in Bragança and Guarda.

As figure 2 shows, between 2000/1 and 2002/3, the press mills were dominant in Trás-os-Montes. However, the press mills number and its share have decreased (112 to 63 in number, and 73 % to 55% in share) and the continuous extraction mills have increased in number (39 to 48) and in share (25 % to 42 %). So, it is possible to conclude that in Trás-os-Montes the continuous technological processes, that result

[4] "Boletim de Cadastro dos Lagares"

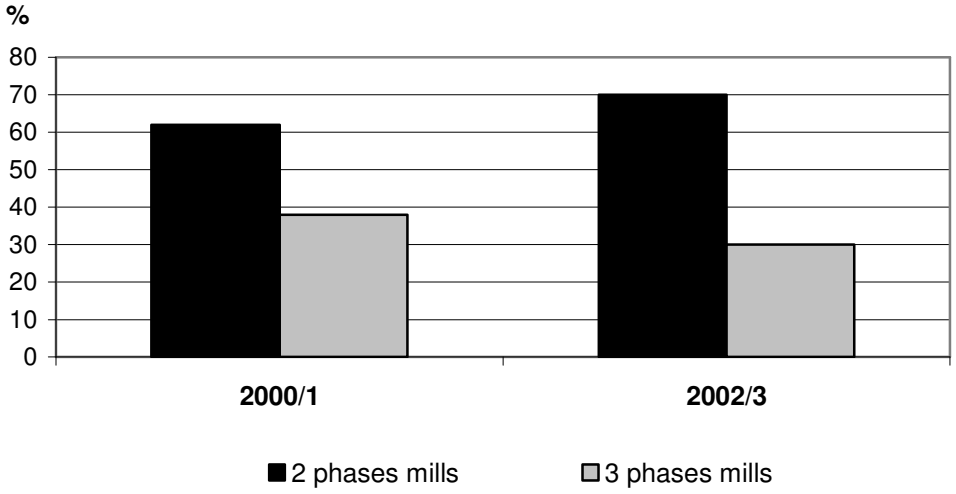
in a more efficient olive oil extraction, in higher productivity, better olive oil quality, and hygienic-sanitarian conditions, are increasing.

Figure 2 – Share of Trás-os-Montes olive mills by type of technology



The database information about continuous extraction mills, also allowed the division into mills that labour with two and three phases extraction systems (figure 3).

Figure 3 – Share of Trás-os-Montes olive mills by continuous extraction technology



Two phases olive mills represented, in 2000/1 and 2002/3, the majority of the continuous extraction olive mills and, comparatively with 3 phases olive mills, also increased its share in that period (fig. 3 and table 6). Bragança had the most significant increase of 2 phases olive mills (26%), in 2002/3 this district represented 66 % of the 2 phases olive mills and 73 % of the 3 phases olive mills in the region. Vila Real didn't have any 3 phases mills in that period and in Guarda, the number decreased from 3 in 2000/1 to 1 mill in 2002/3.

Table 6 – Trás-os-Montes olive mills by continuous extraction technology and by district

District	2 Phases Olive Mills				3 Phases Olive Mills				TOTAL	
	Nº		%		Nº		%			
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
Bragança	17	23	65	66	10	11	63	73	27	34
Guarda	2	3	8	9	3	1	19	7	5	4
Vila Real	5	6	19	17	0	0	0	0	5	6
Viseu	2	3	8	9	3	3	19	20	5	6
TOTAL	**26**	**35**	**100**	**100**	**16**	**15**	**100**	**100**	**42**	**50**

Another relevant indicator for Trás-os-Montes olive mills marketing characterization is the presence of bottling lines that may reveal the olive mills' marketing capability to bottle and trade their own olive oil obtaining a higher value for the final product.

In the 2000/1 – 2002 /3 period, the share of olive mills having a bottling line (according to those that answered to this question in the annual survey) was considerably low (12 % in 2000/1 and 18 % in the 2002/3, table 7). This fact suggests the following remarks:

- Most of the olive mills, deliver olive oil to the olive farmers that are associated with them (in this case, farmers have their own equipment to transport and eventually bottle this olive oil manually), or sell it to olive oil distributors, some of them having their own bottling lines;
- These olive mills show low capability to add value to the final product, not only as a consequence of their organization and management, but also because of their low level of human resources' competences;
- Some larger size olive mills can provide a bottling service to other.

Table 7 – Share of Trás-os-Montes olive mills' equipped with bottling line by district

District	Bottling Line					
	N.º		%		% from Total *	
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
Bragança	9	8	64	53	8	9
Guarda	1	2	7	13	1	2
Vila Real	4	4	29	27	4	5
Viseu	0	1	0	7	0	1
TOTAL	**14**	**15**	**100**	**100**	**12**	**18**

* According to the mills that answer this question: in 2000, 113 mills (73% of total); and in 2002, 85 mills (75% of total).

According to table 8, the storage capacity in Trás-os-Montes has raised 4% during the 2000/1 – 2002/3 period (10,5 million liters in 2002/3).

Table 8 – Share of Trás-os-Montes olive mills total and INOX storage capacity by district

District	Total Storage Capacity				INOX Storage (%)	
	Liters		%			
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
Bragança	7 009 327	7 313 407	69	69	96	98
Guarda	613 821	791 821	6	7	93	94
Vila Real	2 119 651	2 023 931	21	19	94	98
Viseu	439 495	442 395	4	4	76	89
TOTAL	**10 182 294**	**10 571 554**	**100**	**100**	**95%**	**97**

The 2002/3 storage capacity distribution in the region is very similar to the olive mills' distribution. Bragança was the most representative district (60 % of the mills and 69 % of the storage capacity), followed by Vila Real (with 17 % of the mills and 19 % of the storage capacity) and Guarda (with 7 % of the mills and 7 % of the storage capacity).

Relatively to INOX storage capacity in vats and tanks, indirect indicator of the quality of olive oil obtained (because this material is fundamental, not only to prevent olive oil physical and chemical contaminations, but also to keep olive oil organoleptic characteristics), it is possible to conclude that it represents almost all the Trás-os-Montes' storage capacity and raised from 95 % to 97 %, between 2000/1 and 2002/3 as can be checked in table 8.

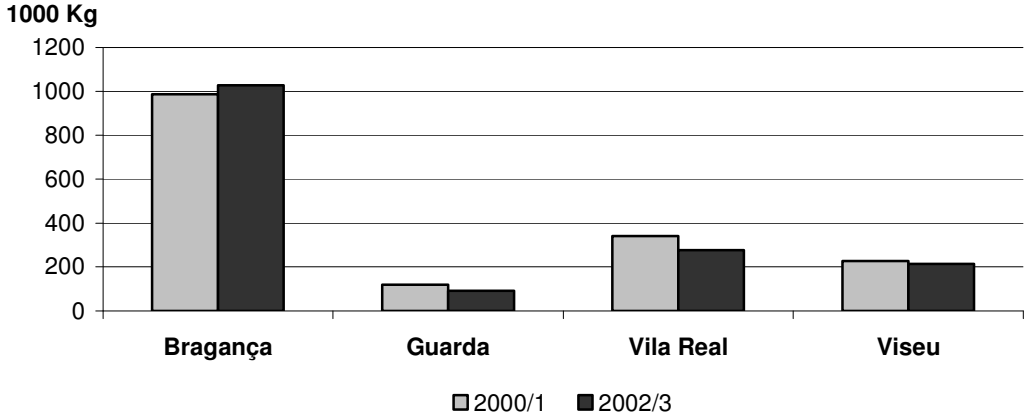
The technological potential capacity to process olives (that reports to an 8 hours period/day), had decreased globally 4 % between 2000/1 and 2002/3, and was approximately 1,6 million kg in this last harvest year.

Table 9 – Trás-os-Montes olive mills potential processing capacity (kg of olives) by district

District	Potential Processing Capacity				
	Kg		Evolution (2000/1 – 2002/3)	%	
	2000/1	2002/3		2000/1	2002/3
Bragança	986 842	1 026 922	4%	59	64
Guarda	118 800	90 800	-24%	7	6
Vila Real	341 710	277 710	-19%	20	17
Viseu	227 400	215 600	-5%	14	13
TOTAL	**1 674 752**	**1 611 032**	**-4%**	**100**	**100**

This reduction was observed in all Trás-os-Montes districts, but mostly in Guarda (-24%). Bragança was an exception, where the technological potential capacity raised 4%, and represented in 2002/3, 64% of the regional technological potential capacity, i.e., more than 1 million kilos of olives in an 8 hours period (figure 4).

Figure 4 – Trás-os-Montes potential processing capacity (kg) by district

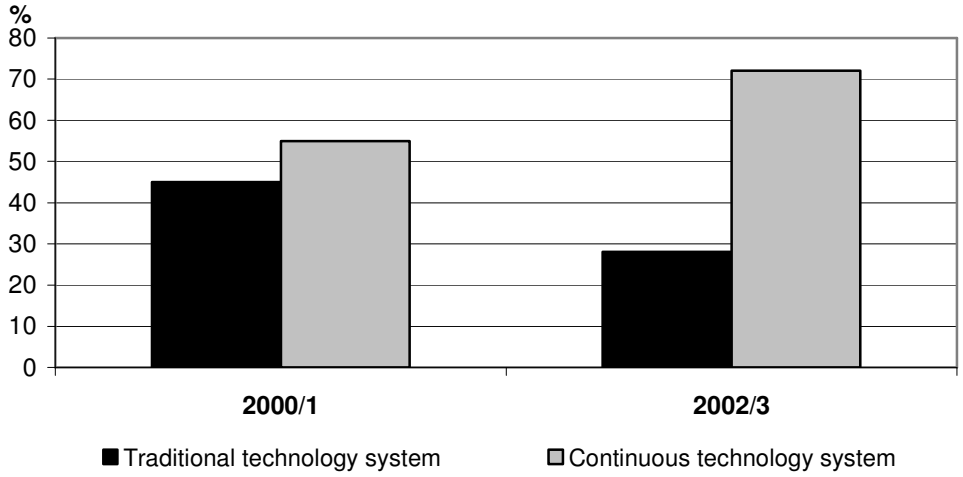


The information available allowed also the breakdown of the whole potential capacity into traditional and continuous technologies (table 10 and figure 5).

Table 10 – Trás-os-Montes olive mills potential processing capacity by type of extraction system and by district

District	Technological Potential Capacity - Traditional Extraction Systems				Technological Potential Capacity - Continuous Extraction systems			
	Kg		%		Kg		%	
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
Bragança	391 522	258 562	52	57	595 320	768 360	65	67
Guarda	70 300	50 300	9	11	48 500	40 500	5	4
Vila Real	173 040	85 040	23	19	168 670	192 670	18	17
Viseu	118 600	63 700	16	14	108 800	151 900	12	13
TOTAL	**753 462**	**457 602**	**100**	**100**	**921 290**	**1 153 430**	**100**	**100**

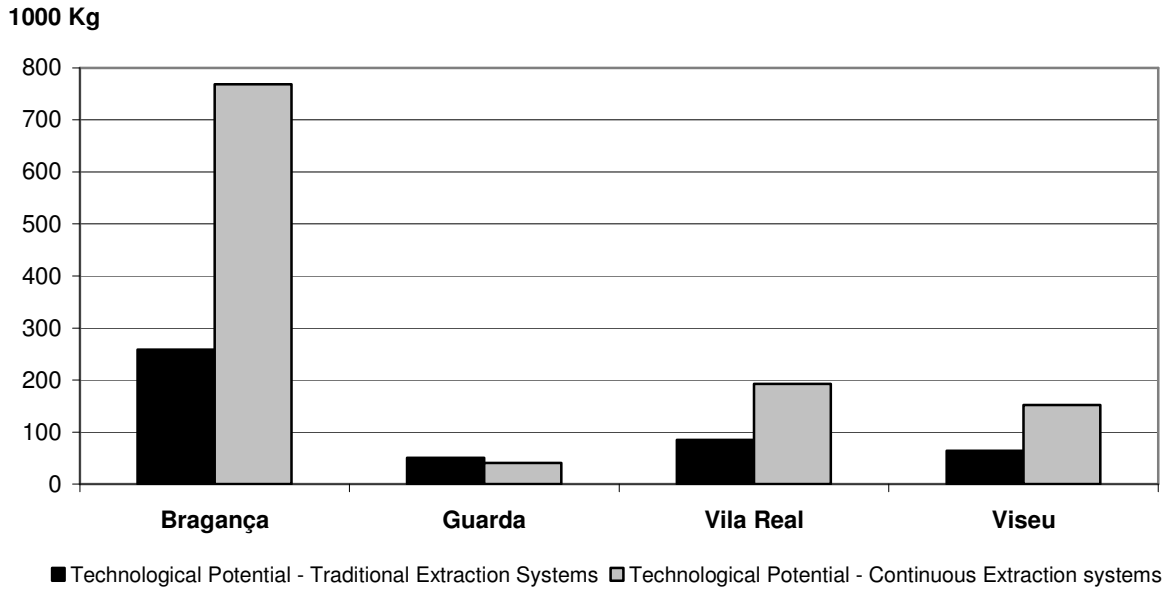
Figure 5 – Share of Trás-os-Montes olive mills potential processing capacity (kg of olive) by type of extraction system



The potential processing capacity, between 2000/1 and 2002/3, was higher for the continuous than for the traditional system, and raised from 55 % to 72 % of the total Trás-os-Montes' potential. Bragança was the most relevant district on both type of systems and Guarda is the only district where the traditional extraction system was more relevant than the continuous system.

Table 10 data allows to confirm that between 2000/1 and 2002/3 the traditional systems' technological potential capacity decreased 39 % in the region, in all districts, but mostly in Vila Real (51 %) and Viseu (46 %). The continuous system' technological potential capacity has raised in three districts, and mostly in Viseu (40 %) and Bragança (29 %), and decreased in Guarda (16 %).

Figure 6 – Trás-os-Montes olive mills potential processing capacity by type of extraction system and by district (2002/3)



It is possible to conclude that the continuous systems average potential capacity to process olives per olive mill is three times higher (almost 23 069 kilos per recognized mill in 2002/3) than it is in the traditional systems (7 040 kilos per recognized mill).

Table 11 – Trás-os-Montes olive mills average potential processing capacity by type of technology and by district

District	Technological Potential Average Capacity Per Olive Mill - Traditional Systems		Technological Potential Average Capacity Per Olive Mill - Continuous Systems	
	Kg		Kg	
	2000/1	2002/3	2000/1	2002/3
Bragança	5 921	6 018	23 030	23 265
Guarda	11 717	10 060	12 125	13 500
Vila Real	7 226	6 858	16 223	24 168
Viseu	46 300	5 154	24 150	22 980
TOTAL	**6 668**	**7040**	**22 470**	**23 069**

It's also interesting to verify the evolution of the average technological potential capacity per mill in the region, that increased 3 % in the continuous mills (22 470 kg capacity in 2000/1 to 23 069 kg in 2002/3) and 6 % in the traditional mills (6 668 to 7 040, between 2000/1 to 2002/3).

2.4 PROCESSED OLIVES ORIGIN AND PROCESSING FEES

Concerning the origin of processed olives two possibilities may be identified. The most common is the one associated with cooperatives, and private olive mills that process olives from different farmers. However some olive growers have their own olive mills processing eventually olives from other olive growers.

When processed olives don't come from the mill owner/olive grower they can be purchased or, as an alternative, the olive mill supplies only a processing service, for which producers will have to pay with a specific amount of the olive oil obtained ("maquia") or with a monetary amount ("processing monetary fees").

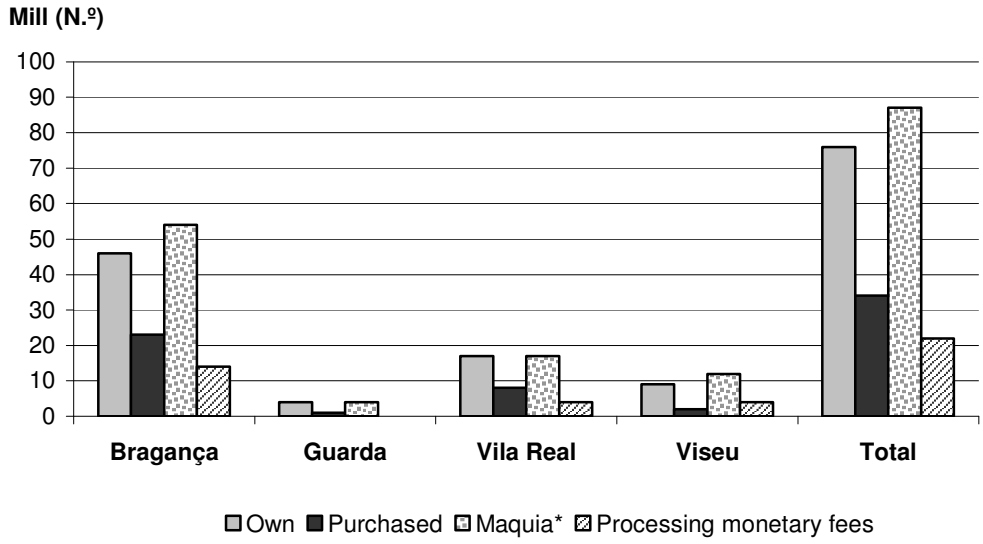
Table 12 shows the distribution of the olive mills according to the different possibilities above mentioned. It is worth to remark that one olive mill can display more than one of those possibilities (ex: own olives plus "maquia").

Table 12 – Trás-os-Montes olive mills by type of processed olives origin and processing fees

District			Bragança	Guarda	Vila Real	Viseu	TOTAL
Purchase	Nº	2000/1	24	2	11	3	40
		2002/3	23	1	8	2	34
	%	2000/1	60	5	28	8	100
		2002/3	68	3	24	6	100
"Maquia"	Nº	2000/1	68	6	24	17	115
		2002/3	54	4	17	12	87
	%	2000/1	59	5	21	15	100
		2002/3	62	5	20	14	100
Processing Monetary Fees	Nº	2000/1	16	0	6	5	27
		2002/3	14	0	4	4	22
	%	2000/1	59	0	22	19	100
		2002/3	64	0	18	18	100
Own	Nº	2000/1	60	3	20	13	96
		2002/3	46	4	17	9	76
	%	2000/1	63	3	21	14	100
		2002/3	61	5	22	12	100

Note: The olives acquisition, by each mill, can be cumulative in all the different types.

Figure 7 – Trás-os-Montes olive mills by type of processed olives origin and processing fees (2002/3)



According to this table a large proportion of regional olive mills process their own olives, in some cases associated with olives from other growers although, their number decreased 21% between 2000/1 and 2002/3.

The most usual type of processing fees is the “maquia”, as monetary fees have a reduced representation.

3. TRÁS-OS-MONTES OLIVE OIL PRODUCTION CHARACTERIZATION

For Trás-os-Montes olive oil production characterization, four parameters were considered: processed olives quantity, number of farmers that delivered olives to recognized mills, olive oil obtained and aid amount paid to the farmers according to the olive oil produced.

3.1 PROCESSED OLIVES QUANTITY

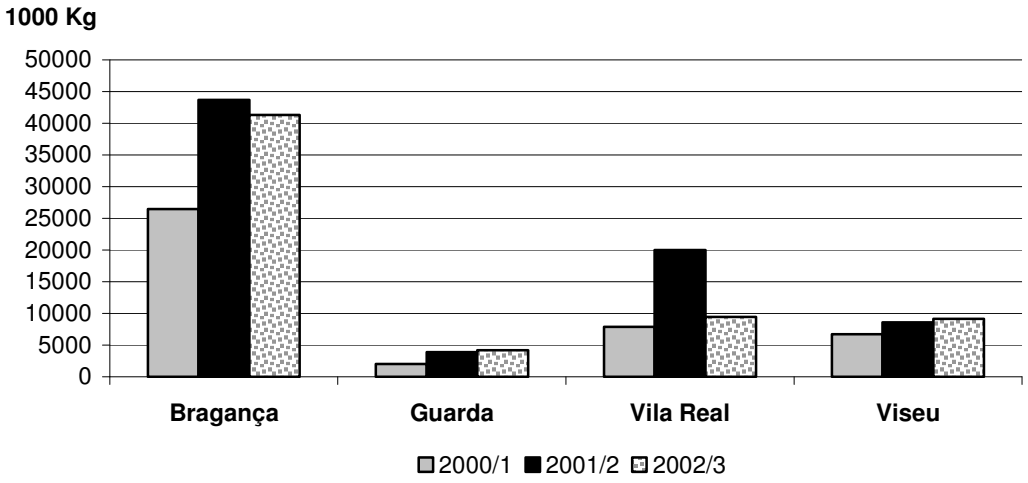
The processed olives information (table 13) shows a high variability along 2000/1 – 2002/3 period. The lowest and the highest values occurred in 2000/1 and 2001/2, and the average value in the three harvest years was 61 100 t of processed olives.

Table 13 – Processed olives (kg) by Trás-os-Montes districts

District	Processed Olives (kg)		
	2000/1	**2001/2**	**2002/3**
Bragança	26 467 963	43 675 199	41 326 087
Guarda	2 026 512	3 863 702	4 216 552
Vila Real	7 883 648	20 015 431	9 460 085
Viseu	6 698 184	8 600 733	9 138 610
TOTAL	**43 076 307**	**76 155 065**	**64 141 334**

After 43 000 t of processed olives declared in the first harvest campaign, a 77 % increase occurred in the following year (more than 76 000 t), and a 16 % decrease in the 2002/3 (64 000 t). This strong annual variability is a well known characteristic of olive trees production. However, it has not been uniform in all Trás-os-Montes' districts. In Guarda and Viseu, the olive quantity delivered raised progressively during this three years period (figure 8).

Figure 8 – Processed olives by Trás-os-Montes districts



In the last harvest campaign considered, Bragança was the most representative district with 64 % of the total processed olives in the region; followed by Vila Real with 15 %, Viseu with 14 % and Guarda with 7 %.

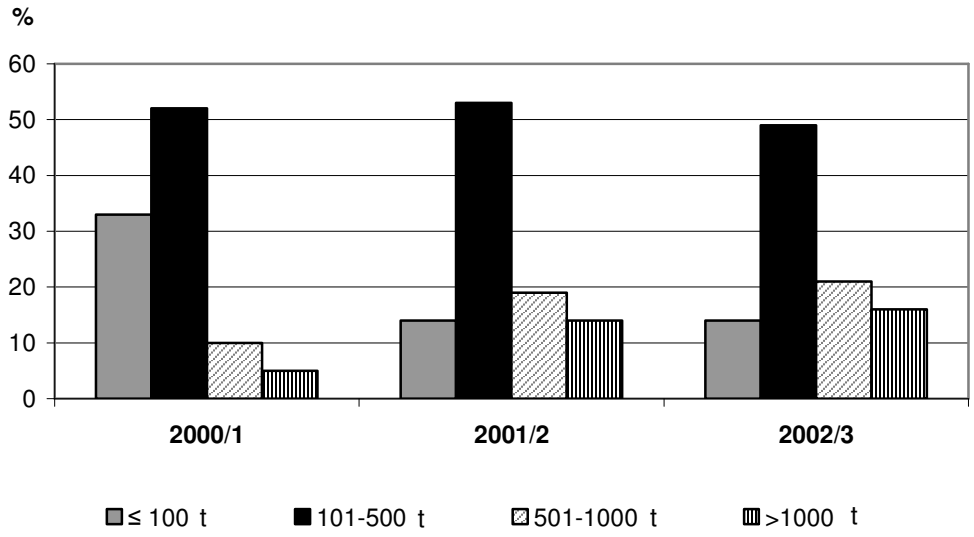
It is also worth to mention the possibility of olives being harvested in one district and processed in other district (and even be acquired in a different Portuguese region and processed in Trás-os-Montes, or the reverse).

To analyze the relationship between olive mills and processed olives quantity by harvest campaign in the four districts, another indicator was considered based on olive mills size classes in terms of processed olives quantity. The information allowed to considerer the following size classes: lower that 100 t, between 101 and 500 t, between 501 and 1000 t, and more than 1000 t of olives processed (table 14 and figure 9).

Table 14 – Trás-os-Montes olive mills by size classes (t of processed olives) and by district

District		Bragança	Guarda	Vila Real	Viseu	TOTAL
2000/1	≤ 100 t	32	2	11	6	**51**
	101 - 500 t	42	6	16	17	**81**
	501 - 1000 t	9	1	2	4	**16**
	> 1000 t	6	0	1	0	**7**
	TOTAL	**89**	**9**	**30**	**27**	**155**
2001/2	≤ 100 t	14	1	3	1	**19**
	101 - 500 t	36	6	15	13	**70**
	501 - 1000 t	15	1	4	5	**25**
	> 1000 t	13	1	4	1	**19**
	TOTAL	**78**	**9**	**26**	**20**	**133**
2002/3	≤ 100 t	13	1	1	1	**16**
	101 - 500 t	29	4	13	10	**56**
	501 - 1000 t	13	2	4	5	**24**
	> 1000 t	14	1	1	2	**18**
	TOTAL	**69**	**8**	**19**	**18**	**114**
TOTAL		**236**	**26**	**75**	**65**	**402**

Figure 9 – Trás-os-Montes olive mills by size classes (t of processed olives)



In each of the three harvest campaigns, the most representative class was the 101 - 500 t of processed olives (52% in 2000/1, 53% in 2001/2 and 49 % in 2002/3 of the Trás-os-Montes' mills). The ≤ 100 t and > 1000 t classes were the less representative (always lower than 16 %), except on 2000/1 where the ≤ 100 t class represented 33 % of Trás-os-Montes' olive mills.

In 2001/2 and 2002/3, Bragança was the district that showed a more uniform distribution of the number of olive mills in each of the classes considered, and mostly in the larger size classes. This fact can be explained by the increase of the technological capacity in several olive mills, as well as the close/disappearance of others that had lower capacity and didn't present the necessary conditions to be recognized by INGA Institution.

3.2 NUMBER OF FARMERS THAT DELIVERED OLIVES TO RECOGNIZED MILLS

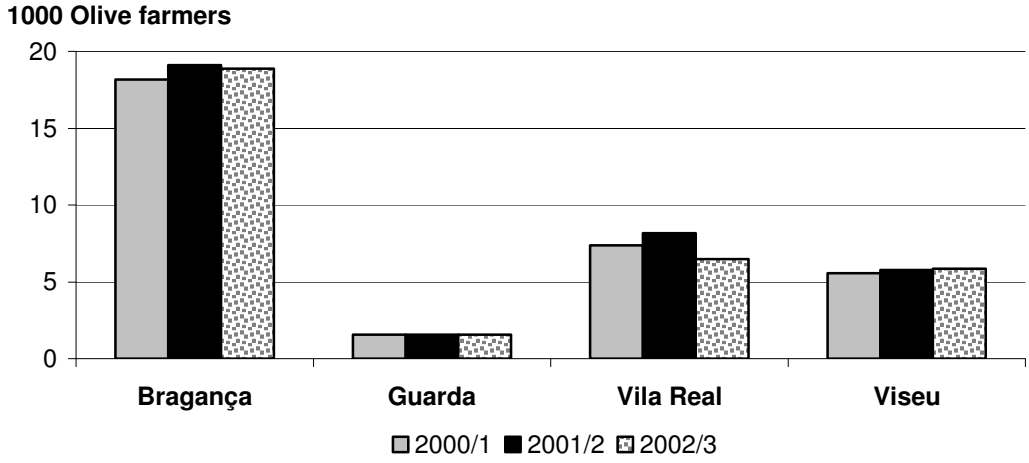
According to table 15, and relatively to the farmers that delivered olives in recognized olive mills, the number was in average 33400 farmers in the three harvest campaigns, showing a weak variability along the years (a maximum in 2001/2 with 34628 and a minimum in 2000/1 with 32665) and districts.

Table 15 – Olive farmers by harvest campaign and by district

District	Total Number of Olive Farmers That Delivered Olives			Total Number of Olive Farmers That Delivered Olives and Received Olive Oil Production Aid		
	2000/1	2001/2	2002/3	2000/1	2001/2	2002/3
Bragança	18 163	19 105	18 880	17 743	18 586	18 519
Guarda	1 549	1 560	1 565	1 509	1 489	1 498
Vila Real	7 373	8 176	6 480	7 165	7 678	6 258
Viseu	5 580	5 787	5 868	5 428	5 555	5 703
TOTAL	**32 665**	**34 628**	**32 793**	**31 845**	**33 308**	**31 978**

In the three harvest campaigns, Bragança represented approximately 56 % of the total olive farmers that delivered olives in Trás-os-Montes recognized mills (more than 18 thousand farmers), followed by Vila Real with 22% (figure 10).

Figure 10 – Olive farmers by harvest campaign and by district



3.3 OLIVE OIL PRODUCTION

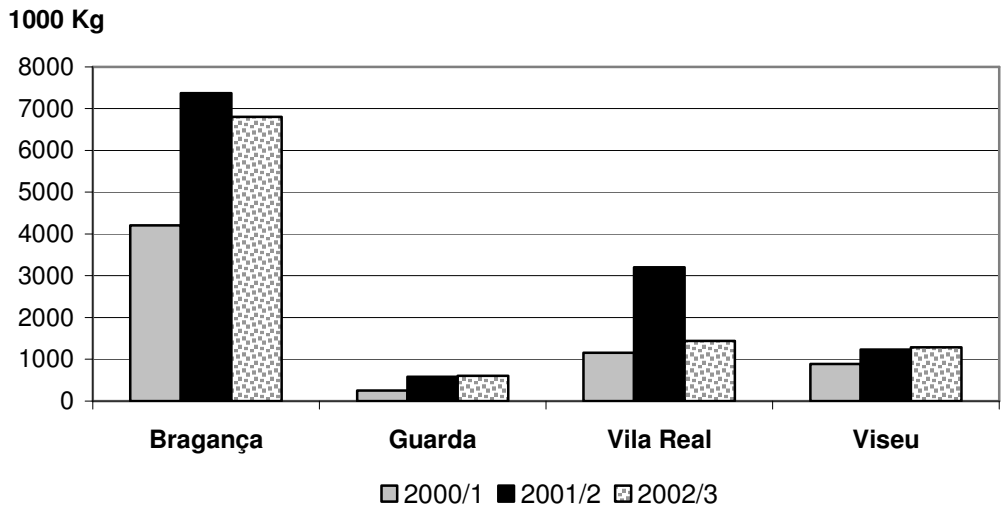
According to table 16, and for the three harvest campaigns considered, the average of olive oil obtained was 9.7 million kg (a maximum of 12,3 million kg in 2001/2 and a minimum of 6,5 million kg in 2000/1). When we "cross" this data with olives processed information, it is possible to determine the olive oil yield, in each harvest campaign, that was: 15,1 % in 2000/1, 16,3 % in 2001/2 and 15,8 % in 2002/3.

Table 16 – Olive oil production (kg) by harvest campaign and by district

District	Olive oil obtained (kg)		
	2000/1	2001/2	2002/3
Bragança	4 208 014	7 365 392	6 802 291
Guarda	248 155	577 325	601 173
Vila Real	1 150 125	3 201 208	1 442 935
Viseu	884 704	1 227 720	1 292 918
TOTAL	**6 490 998**	**12 371 645**	**10 139 317**

Analyzing by district, the evolution of olive oil produced was similar to the one of olives processed. Bragança was the main producer district, with an average of 64 % of the total olive oil obtained in the region, in the three harvest campaigns, Vila Real (the most irregular district) with 20 %, Viseu with 12 % and Guarda with 4 %.

Figure 11 – Olive oil production (kg) by harvest campaign and by district



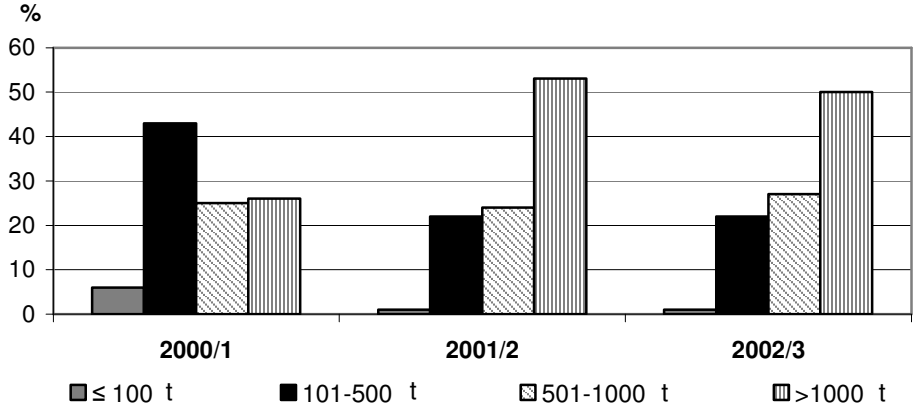
According to figure 11, it is possible to conclude that Bragança olive oil production has always been above 4 million kg in the three harvest years period. In the remaining districts only Vila Real, in 2001/2, exceeded the 3 million kg of olive oil obtained.

The number of farmers, the olives processed and olive oil obtained information allowed the assumption that, between 2000/1 – 2002/3, with an average number of 33400 olive farmers, each one processed 1.830 kg of olives and obtained 290 kg of olive oil (corresponding to a 15,9 % yield).

Table 17 – Trás-os-Montes olive oil production (t) by size classes and by district

District		Bragança	Guarda	Vila Real	Viseu	TOTAL
2000/1	≤ 100 t	289 729	11 070	81 459	24 577	**406 835**
	101 – 500 t	1 560 878	162 516	466 839	550 285	**2 740 518**
	501 – 1000 t	1 050 113	74 569	217 950	309 842	**1 652 474**
	> 1000 t	1 307 294	0	383 877	0	**1 691 171**
	TOTAL	**4 208 014**	**248 155**	**1 150 125**	**884 704**	**6 490 998**
2001/2	≤ 100 t	109 114	13 642	40 250	1 915	**164 921**
	101 – 500 t	1 384 957	248 405	632 609	496 752	**2 762 723**
	501 – 1000 t	1 961 151	72 516	429 300	556 986	**3 019 953**
	> 1000 t	3 910 170	242 762	2 099 049	172 067	**6 424 048**
	TOTAL	**7 365 392**	**577 325**	**3 201 208**	**1 227 720**	**12 371 645**
2002/3	≤ 100 t	109 312	15 132	10 407	13 102	**147 953**
	101 – 500 t	1 194 251	123 355	446 144	424 405	**2 188 155**
	501 – 1000 t	1 628 736	222 832	395 204	518 755	**2 765 527**
	> 1000 t	3 869 992	239 854	591 180	336 656	**5 037 682**
	TOTAL	**6 802 291**	**601 173**	**1 442 935**	**1 292 918**	**10 139 317**
TOTAL		**18 375 697**	**1 426 653**	**5 794 268**	**3 405 342**	**29 001 960**

Figure 12 – Share of olive oil production by olive mill size classes



According to figure 12, it is possible to conclude that along the three harvest years, the weight of olive oil produced by the two larger classes (501 – 1000 t and > 1000 t) has increased. In 2000/1, the total olive oil produced by these two classes represented 51 % of the total olive oil (26% in > 1000 t class) and in 2002/3, 77 % of the total olive oil produced (the >1000 t class represented 50%).

"Crossing" the number of olive mills (table 14) with the olive oil obtained by size classes (table 17), it is possible to confirm, as expected, that for 2002/3 harvest campaign, the average of olive oil produced per olive mill was higher in mills that process higher olives quantity: 9200 kg per mill in the ≤ 100 t class; 39100 kg per mill in the 101 – 500 t class; 115200 kg in the 501 – 1000 t class; and 279900 kg per mill in the > 1000 t class. In 2002/3, and for the 114 INGA' recognized olive mills, the total average was 88900 kg per olive mill.

For each of the four districts, the share of olive oil produced in the two largest olive mills classes was, in general, similar to the one observed globally in Trás-os-Montes. In Bragança and Guarda, and in 2002/3, the olive mills of these two largest classes were responsible for more than 75 % of the olive oil obtained, and in Viseu and Vila Real for more than 65%.

3.4 OLIVE OIL PRODUCTION AID AMOUNT PAID TO THE FARMERS

The last variable considered for Trás-os-Montes olive oil production characterization was the olive oil aid amount paid to olive farmers that delivered olives in a recognized mill (table 18).

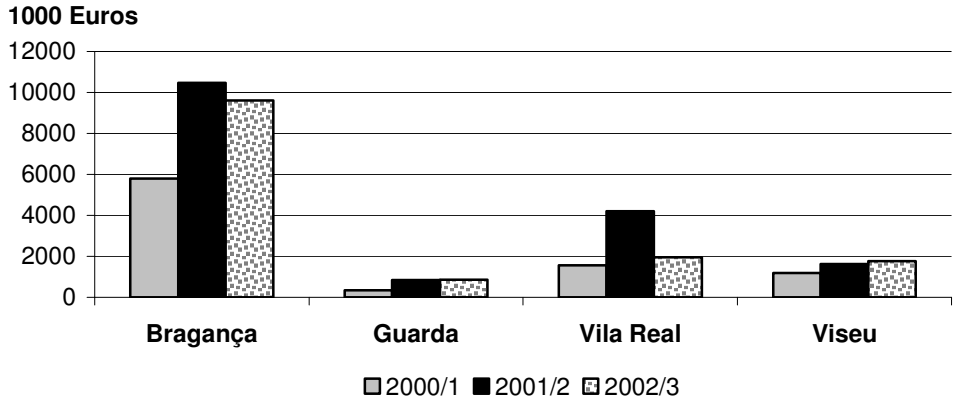
Table 18 – Trás-os-Montes olive oil production aid amount by harvest campaign and by district

District	Aid Paid Amount (€)		
	2000/1	2001/2	2002/3
Bragança	5 796 818	10 466 092	9 605 446
Guarda	339 208	843 344	855 391
Vila Real	1 549 248	4 205 506	1 949 513
Viseu	1 188 269	1 623 477	1 763 948
TOTAL	**8 873 543**	**17 138 419**	**14 174 298**

For the analyzed harvest campaigns, the average amount per campaign received by Trás-os-Montes' olive farmers was 13,4 millions euros, depending on the delivered quantity of olives and the olive oil produced. For a total of 32 400 farmers, the average value received for each one was 414 euros.

In 2001/2 (the year that registered the highest production), the maximum received in average by farmer was 515 euros. The minimum was verified in 2000/1 harvest campaign, with 279 euros per farmer. Bragança district received in the three harvest campaigns an average of 8,6 million euros per year (64 % of total), representing 56% of Trás-os-Montes supported olive farmers.

Figure 13 – Trás-os-Montes olive oil production aid amount by harvest campaign and by district



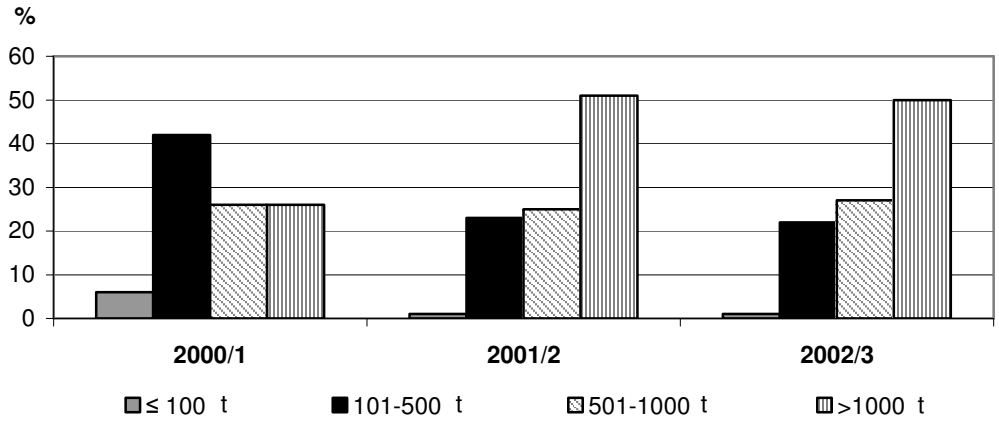
Bragança and Vila Real are the most relevant districts in terms of aid amount received and those where olive farming and olive oil production have more expression in Trás-os-Montes region (more than 83 % of olive oil production aid in Trás-os-Montes, during these three harvest campaigns).

INGA' information allowed to cross the aid amount received per farmer in each harvest campaign with the olive mills' size classes (table 20).

Table 20 – Olive oil production aid amount (€) by olive mill' size classes and by district

District		Bragança	Guarda	Vila Real	Viseu	TOTAL
2000/1	≤ 100 t	390 369	15 531	109 541	31 886	**547 327**
	101 – 500 t	2 156 838	218 204	620 449	738 117	**3 733 608**
	501 – 1000 t	1 458 011	105 473	291 396	418 266	**2 273 146**
	> 1000 t	1 791 600	0	527 862	0	**2 319 462**
	TOTAL	**5 796 818**	**339 208**	**1 549 248**	**1 188 269**	**8 873 543**
2001/2	≤ 100 t	179 283	19 212	50 474	2 697	**251 666**
	101 – 500 t	2 085 770	359 020	824 296	652 546	**3 921 632**
	501 – 1000 t	2 812 046	121 116	562 801	745 872	**4 241 835**
	> 1000 t	5 388 993	343 996	2 767 935	222 362	**8 723 286**
	TOTAL	**10 466 092**	**843 344**	**4 205 506**	**1 623 477**	**17 138 419**
2002/3	≤ 100 t	158 922	18 401	14 054	17 374	**208 751**
	101 – 500 t	1 746 895	178 829	602 670	575 893	**3 104 287**
	501 – 1000 t	2 298 759	317 493	533 126	710 618	**3 859 996**
	> 1000 t	5 400 870	340 668	799 663	460 062	**7 001 263**
	TOTAL	**9 605 446**	**855 391**	**1 949 513**	**1 763 948**	**14 174 298**
TOTAL		**25 868 356**	**2 037 943**	**7 704 267**	**4 575 694**	**40 186 260**

Figure 14 – Share of olive oil production aid amount by olive mill' size classes



The most significant share of aid amount paid to Trás-os-Montes' olive farmers is concentrated in those that process olives in larger olive mills, and particularly in the two largest classes (501-1000 t and > 1000 t), with 52 % in 2000/1, 76 % in 2001/2 and 77 % in 2002/3. The aid amount received by farmers that delivered olives to lower dimension mills (< 100 t and 101 - 500 t classes), showed a significant expression in 2000/1, and mostly on the second class, with 42 % of the regional production aid in this harvest year.

Finally, it is important to mention that in 2002/3, olive mills processing more than 500 t of olives represented in Bragança more than 80 % of the total aid amount, 77% in

Guarda, 68% in Vila Real and 66% in Viseu. In opposition the lowest size class (≤ 100 t) represented only 2 % in Guarda, 1,7 % in Bragança, 1% in Viseu and 0,7 % in Vila Real.

In general Trás-os-Montes olive mills have been improving their technological capacity in the sense of obtaining a higher quality production. As an example of that, the increase of 17 % in the share of continuous extraction systems over the total recognized Trás-os-Montes olive mills in the timespan of three campaigns, 2000/1 to 2002/3, is a good indicator of a quality improvement strategy. Another fact is the increase of olive mills size in spite of a decline in number. Whether or not a consequence of the technological change, it might in a near future bring new attitudes in what concerns marketing.

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Olive Oil Marketing and Processing Analysis – Olivero Project

ADMINISTRATIVE UNIT: GRANADA PROVINCE

SOURCE: DELEGACIÓN DE AGRICULTURA DE GRANADA

1. Indicators for Olive Processing Infrastructure

- ***Indicator 1*** **– Number of regional olive oil processing units by administrative unit or other sub-region (Ex: distrito for Portugal), on the last three campaigns available**

  a. Number of installed and certified processing units by sub-region, in the three last campaigns.

2001-02	2002-03	2003-04
119	101	108

- ***Indicator 2*** **– Olive mills by type of management, on the last three campaigns available**

  a. Olive mills breakdown by type of management: *ownership management*, *rent management*, *firm management*, *cooperative management*, *other types of management* and missing information

	2001-02	2002-03	2003-04
Agrícolas	6	0	7
Cooperativas	40	35	39
Industriales (particular, SL. SA. CB)	71	65	60
SAT	2	1	2

- ***Indicator 4*** **– Type of processing technology, on the last three campaigns available**

  a. Olive mills breakdown by type of technology: *traditional extraction* process or *continuous extraction process*

		2001-02	2002-03	2003-04
Tradicional		22	19	14
Continuo	2 fases	90	75	89
	3 fases	2	5	2
Mixto		5	2	3

b. Traditional olive mills breakdown by average number of press mechanisms

Prensas	1	2	3	4	5	6
2001-02	7	3 (+1 mixto)	5 (+1 mixto)	3 (+1 mixto)	3 (+1 mixto)	1 (+1 mixto)
2002-03	5	7	1 (+1 mixto)	3 (+1 mixto)	3	
2003-04	5	5	1	1 (+1 mixto)	2 (+1 mixto)	(+1 mixto)

c. Continuous olive mills breakdown by type of continuous extraction process: *three phases continuous extraction process* or *two phases continuous extraction process*

Fases	2	3
2001-02	90 (+5 mixto)	2
2002-03	75 (+2mixto)	5
2003-04	89 (+3 mixto)	2

- ***Indicator 5*** **– Olive mills packing equipment, on the last three campaigns available**

a. Number of olive mills with packing equipment

	2001-02	2002-03	2003-04
Nº Almazaras	76	70	76

- ***Indicator 6*** **– Type of storing containers and storing capacity, on the last three campaigns available**

a. Olive mills by classes of storing capacity and by the proportion on total of the inox storing capacity

% de almacenamiento por tipo de depósito	2001-2002	2002-03	2003-04
Al	74	71	80
Acero al carbono S R	8	13	9
Acero al carbono R	10	10	4
Vidrio	6	4	3
Otros	2	2	4

b. Storing capacity breakdown by type of storing containers

Cantidad de depósitos	2001-2002	2002-03	2003-04
Al	1185	1056	1407
Acero al carbono S R	475	396	430
Acero al carbono R	68	165	97
Vidrio	144	143	145
Otros	213	180	122

- ***Indicator 7*** **– Milling capacity by type of extraction technology, on the last three campaigns available**

  a. Olive mills by classes of milling capacity

Kg/h.	≤100	101-500	501-1000	>1000
2001-02		6	15	98
2002-03		4	11	86
2003-04		4	15	89

  b. Olive mills by classes of milling capacity considering the type of extraction technology: *traditional system milling capacity and continuous system milling capacity*

Kg/h.		≤100	101-500	501-1000	>1000
2001-02	T		5	8	9
	PC		1	7	89
2002-03	T		4	8	7
	PC		-	3	79
2003-04	T		4	5	5
	PC		-	10	84

- ***Indicator 8*** **– Olive oil production origin and processing fees, on the last three campaigns available**

  a. Olive mills by types of production origin and processing fees: *own olives*, *purchased olives*, processing fees paid in olive oil and *processing monetary fees*

2. Indicators for Olive Oil Production Analysis

- ***Indicator 9*** **– Processed olives by administrative unit, on the last three campaigns available**

  a. Processed olives breakdown by administrative unit

	2001-02	2002-03	2003-04
Kg Aceituna transformada	462.229.905	321.462.715	515.278.060

b. Correspondent number of olive growers by administrative unit

c. Olive mills breakdown by processed olive amount classes

Example 1. Olive mills breakdown by dimension (t of processed olives) in the main sub-regions on the last three campaigns

.	2000					2001					2002				
	≤100	101-500	501-1000	>1000	Total	≤100	101-500	501-1000	>1000	Total	≤100	101-500	501-1000	>1000	Total

- ***Indicator 10*** **– Production management, on the last three campaigns available**

a. Number of olive mills per type of production management (as put in indicator 8) breakdown by processed olive classes

- ***Indicator 11*** **– Olive oil production, on the last three campaigns available**

a. Olive oil breakdown by administrative unit

	2001-02	2002-03	2003-04
Kg. aceite	93.152.500	93.600.271	103.013.672

b. Olive oil breakdown by processed olive amounts classes

- ***Indicator 12*** **– Olive oil paid amount, on the last three campaigns available**

a. Paid amount breakdown by administrative unit

b. Paid amount breakdown by processed olive amount classes

COMPARISON BETWEEN PORTUGUESE AND SPANISH OLIVE MILLS SECONDARY INFORMATION

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Instituto Superior de Agronomia (ISA), Lisboa
F. Duarte, N. Jones, C. Lúcio and A. Nunes

Based on Trás-os-Montes and Granada information on olive mills and olive oil production characterization, it is possible to relate some indicators and draw some conclusions.

In Granada the number of recognized olive mills decreased from 2001/2 to 2002/3 but increased on 2003/4. In Trás-os-Montes this number decreased from 2000/1 until 2002/3 harvest campaigns considered (unfortunately, data for 2003/4 campaign are not available yet).

It is interesting to verify that in the 2001/2 and 2002/3 harvest campaigns, Trás-os-Montes had more recognized/certified olive mills than Granada but processed, in average, ten times less olives.

Table 1 – Trás-os-Montes' and Granada recognized olive mills

Regions	Recognized/Certified Olive Mills (n. º)			
	2000/1	2001/2	2002/3	2003/4
Granada	w.i.	119	101	108
Trás-os-Montes and Alto Douro	155	133	114	w.i.

w.i. – without information.

According to Granada information about olive mills' type of management, "*Agrícolas*" represent "the private olive mills, under ownership management and is an old concept that refers to olive mills completely dependant on the farm associated with high levels of self consumption.

"*Cooperatives*" means associative enterprise (without lucrative purposes) in which the users (farmers) are simultaneously the contributors or solicitors of the enterprise. Thus, it is a type of economic association with an important social role. Production of goods or services is organized in community. Each partner represents a vote independently of his contribution to the capital.

The "*Industriales*" group comprehends the SL – "*Sociedad Limitada*" (Limited Society); the SA – "*Sociedad Anónima*" (Anonymous Society); the CB – "*Comunidad de Bienes*" (Community of Goods) and "*Particular*". SL is a business organization, in which the responsibility of partners is limited to their monetary contribution. The

capital is divided in insttalments, all of them with the same value. There will never be more than 25 partners. SA represents a society made up of several partners only identified by the capital contributed. Basically, there are no more limitations. This is the only type of society that can be quoted on the stock Exchange. CB refers to an association of farmers (usually relatives) which do not constitute a society. Management carried on together but the property can be divisible. The common case is the one of brothers receiving parcels of farm in heritage. "*Particular*" is a concept included in this category and supposes a wider margin than "*Agrícolas*". "*Particulars*" can sell or buy olives (whether they are already processed or not) and no matter where they have been produced.

The SAT – "*Sociedad Agraria de Transformación*" (Agrarian Transformation Society) is a special type of association where all the members have to be farmers with an agricultural sense objective.

Table 2 – Granada' olive mills by legal status

Type of management (%)	2001/2	2002/3	2003/4
Agrícolas	5	0	6
Cooperatives	34	35	36
Industriales (particular, SL. SA. CB)	60	64	56
SAT	1	1	2

In the Portuguese case five legal status were considered, rented olive mills where olive oil producers are not the owners; direct management which corresponds to individual entrepreneur; association olive mills which have an associative contract of property; cooperative olive mills, those managed under the cooperative code; and the others, corresponding to those that are not integrated in any of the previous categories (example: olive mills owned by the Portuguese State or owned by entities connected with it). A residual category has been considered under the name "without information", which concerns all the olive mills that don't have any information concerning this variable.

Table 3 – Distribution of Trás-os-Montes' olive mills by legal status

Type of management (%)	2000/1	2002/3
Rent	3	2
Direct	55	51
Association	9	15
Cooperative	11	17
Others	6	3
Without Information	16	12

It was not possible to compare Trás-os-Montes and Granada categories because of their differences. Still on what concerns cooperatives, it is possible to confirm that they have a higher importance in Granada than in Trás-os-Montes.

According to the information available about the type of processing technology, it is possible to conclude that the number of traditional olive mills in Granada is lower than the continuous ones. In opposition in Trás-os-Montes: the number of traditional olive mills is higher than the continuous olive mills, but decreasing.

In both regions, and according to the continuous extraction olive mills, the 2 phases mills are predominant. It's important to say that in Granada the three phases mills represent 2 % in 2001/2, 6% in 2002/3 and 2 % in 2003/4 (excluding mixto mills) while in Trás-os-Montes 38 % in 2000/1 and 2002/3 of the continuous extraction mills.

Table 4 – Type of processing technology in Granada

Type of processing technology	Press Extraction Olive Mills			Continuous Extraction Olive Mills			*Mixto**			Total Number		
	Nº			Nº			Nº					
	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4
TOTAL	22	19	14	92	80	91	5	2	3	119	101	108

* "**mixtos**": both traditional and continuous mills (not both types of continuous mills)

Table 5 – Type of processing technology in Trás-os-Montes

Type of processing technology	Press Extraction Olive Mills		Continuous Extraction Olive Mills		Both		Without Information		Total Number	
	Nº		Nº		Nº					
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
TOTAL	112	63	39	48	3	2	0	1	154	114

Table 6 – Olive mills' distribution by continuous extraction system in Granada

Type of processing technology	2 Phases Olive Mills			3 Phases Olive Mills			TOTAL		
	Nº			Nº			Nº		
	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4
TOTAL	90 (+ 5 mixto)	75 (+ 2 mixto)	89 (+ 3 mixto)	2	5	2	92	80	91

Table 7 – Olive mills' distribution by continuous extraction system in Trás-os-Montes

Type of processing technology	2 Phases Olive Mills		3 Phases Olive Mills		TOTAL	
	Nº		Nº			
	2000/1	2002/3	2000/1	2002/3	2000/1	2002/3
TOTAL	26	35	16	15	42	50

According to the information on olive oil packing equipment available, it is possible to conclude that in Granada 64 % of the olive mills had packing equipment in 2001/2, 69 % in 2002/3 and 70 % in 2003/4. In Trás-os-Montes, according to the available information, there were only 12 % in 2000/1 and 18 % in 2002/3.

Table 8 – Olive mills' equipped with bottling line in Granada

Number of olive mills	N.º			% from Total		
	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4
TOTAL	76	70	76	64	69	70

Table 9 – Olive mills' equipped with bottling line in Trás-os-Montes

Number of olive mills	N.º		% from Total *	
	2000/1	2002/3	2000/1	2002/3
TOTAL	14	15	12	18

Note: * According to the mills that answered this question: in 2000, 113 mills (73% of total); and in 2002, 85 mills (75% of total).

Another indicator that was possible to relate was the share of INOX storage capacity in total storage capacity. In both cases, INOX storage is dominant, representing in Trás-os-Montes almost all the storage capacity.

Table 10 – Olive oil storage capacity in Granada, and its relation with INOX storage

Granada	Total Storage Capacity			INOX Storage (%)		
	Kg of olive oil					
	2001/2	2002/3	2003/4	2001/2	2002/3	2003/4
TOTAL	93 152 500	93 600 270	103 013 672	74	71	80

Table 11 – Olive oil storage capacity in Trás-os-Montes, and its relation with INOX storage

Trás-os-Montes	Total Storage Capacity		INOX Storage (%)	
	Litters			
	2000/1	2002/3	2000/1	2002/3
TOTAL	10 182 294	10 571 554	95	97

According to the information available it was also possible to conclude that on average during the three campaigns Granada processed 432 990 227 kg of olives and Trás-os-Montes 61 124 235 kg.

Table 12 – Olives processed in Granada olive mills

Granada	Olives processed (kg)			Average
	2001/2	2002/3	2003/4	
TOTAL	462 229 905	321 462 715	515 278 060	432 990 227

Table 13 – Olives processed in Trás-os-Montes olive mills

Trás-os-Montes	Olives processed (kg)			Average
	2000/1	2001/2	2002/3	
TOTAL	43 076 307	76 155 065	64 141 334	61 124 235

According to the information available it was also possible to conclude that the average of olive oil production in Granada was 96 588 814 kg and in Trás-os-Montes 9 667 320 kg.

As the Granada region has less olive mills than Trás-os-Montes but processes a much larger quantity of olives, Granada olive mills are considerably bigger than Trás-os-Montes olive mills.

Table 14 – Olive oil obtained in Granada in the three harvest campaigns considered

Granada	Olive oil obtained (kg)			Average
	2001/2	2002/3	2003/4	
TOTAL	93 152 500	93 600 271	103 013 672	96 588 814

Table 15 – Olive oil obtained in Trás-os-Montes in the three harvest campaigns considered

Trás-os-Montes	Olive oil obtained (kg)			Average
	2000/1	2001/2	2002/3	
TOTAL	6 490 998	12 371 645	10 139 317	9 667 320

II. CHARACTERIZATION OF THE OLIVE OIL MARKETING BASED ON INTERVIEWS

CLUSTER ANALYSIS OF THE OLIVE MILLS IN OLIVERO TARGET AREAS

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The cluster analysis was made using the data collected from the Olive Oil Marketing Interviews[5] implemented on the four target areas (Granada, Potenza, Crete, Trás-os-Montes) of the OLIVERO project.

Not all of the variables were used to create the cluster membership. Only those that were related with the attitudes and behaviour concerning olive oil marketing activities were considered (see table 1).

Table 1: Olive mill marketing variables used in cluster analysis

Name	Criteria			Description
Packing Equipment	1 - Yes			if the olive mill possesses packing equipment
	0 - No			if not
Type of containers	0 - None			if the olive mill doesn't sell packed olive oil
	1 - Demijohn			if the olive mill sell packed olive oil in demijohns only
	2 - Bottle			if the olive mill sell packed olive oil in demijohns or bottles
	3 - Single doses			if the olive mill sell packed olive oil in demijohns, bottles or single doses
Market Orientation	1 - Intermediary/ Refinary industry units/ Local wholesale and retail agents	×	% olive oil sold	Index that represents the market orientation (a higher index meaning a closer relationship of the olive mill with the market)
	2 - National wholesale and retail agents			
	3 - Horeca (hotels, restaurants, coffee-shops, catering, ..)			
	4 - Final consumer/ Internet			
Investments	1 - Yes			if the olive mill made any type of investment since 2001
	0 - No			if not
Management according to clients requirements	1 - Yes			if the season workplane is based on clients requirements
	0 - No			if not

[5] Olive oil marketing survey in annex

Table 1 (cont.): Olive mill marketing variables used in cluster analysis

Name	Criteria	Description
Preferences of olive oil consumers	1 - Very important 2 - Important 3 - Not relevant 4 - Less relevant 5 - Not relevant	How the preferences of the olive oil consumers are considered by the olive mill manager
Regular contact with clients	1 - Yes 0 - No	Trade and marketing activities currently developed by the olive mill enterprise
Design of containers, labels, displays	1 - Yes 0 - No	
Market analysis and studies	1 - Yes 0 - No	
Development of new olive oil brands	1 - Yes 0 - No	
Prospecting new business opportunities	1 - Yes 0 - No	
Advertisement activities	1 - Yes 0 - No	
Promotion on sales stands	1 - Yes 0 - No	
Public relations events	1 - Yes 0 - No	Trade and marketing activities currently developed by the olive mill enterprise
Search of transport services to ensure deliveries	1 - Yes 0 - No	
Search of new technology suppliers	1 - Yes 0 - No	
Analysis of competitive prices	1 - Yes 0 - No	
Search of trading opportunities abroad	1 - Yes 0 - No	
Market perspectives: New Clients	1 - Yes 0 - No	if in the coming years the olive mill intends to trade the olive oil to new clients if not
Market perspectives: New Areas	1 - Yes 0 - No	if in the coming years the olive mill intends to trade the olive oil to new areas if not

Using K-Means clusters from SPSS, three groups with similar characteristics (clusters) were defined, according to these variables.

Table 2: Cluster means for attitudes and behavior throughout olive oil marketing

	Cluster		
	1	2	3
Packing Equipment	0	1	1
Type of containers	0	2	2
Market Orientation	1.44	2.99	3.21
Investments	0	1	1
Management according to clients requirements	0	0	1
Preferences of olive oil consumers	2	4	2
Regular contact with clients	1	1	1
Design of containers, labels, displays	0	1	1
Market analysis and studies	0	0	1
Development of new olive oil brands	0	0	0
Prospecting new business opportunities	0	0	1
Advertisement activities	0	1	1
Promotion on sales stands	0	0	0
Public relations events	0	1	1
Search of transport services to ensure deliveries	0	0	1
Search of new technology suppliers	0	0	1
Analysis of competitive prices	0	1	1
Search of trading opportunities abroad	0	0	1
Market perspectives: New Clients	1	0	1
Market perspectives: New Areas	1	0	1
Number of Cases	16	7	16
Proportion of respondents	41%	18%	41%

Cluster 1 – Around 41% of the olive mills sample can be classified as "Production Oriented" as they do not commercialized packed olive oil and do not develop any kind of trade and marketing activities except the regular contact with clients. Intermediaries and refinery industries are the main clients of these olive mills. However these firms consider important olive oil consumer preferences and are trying to expand the olive oil market to new clients at a national level.

Cluster 2 – Around 18% of respondents can be classified as "Sales Oriented" olive mills. This group of olive mills can be characterized by selling bottled olive oil and for having a relatively high market orientation index. Although developing some trade and marketing activities, this type of firms are not concerned with client's preferences and they are not trying to expand their trade and marketing activities to new clients, neither to new geographical areas.

Cluster 3 – Around 41% of respondents can be classified as "Market Oriented" olive mills. These firms are closer to the final consumer, considering their preferences important and selling the majority of the bottled olive oil directly to them. Trade and

marketing activities are done all over the year and there is a constant search for trading opportunities in new geographical areas, namely abroad, and to new clients.

Having identified three distinct clusters of olive mills firms according to the attitudes and behaviour concerning olive oil marketing, the characteristics of respondents were examined to identify whether certain types of olive mills belong to a particular cluster. The olive mill structural variables used in this characterisation are mentioned in the table below.

Table 3: Olive mill structural variables

Name	Criteria			Description
Processed olives	1 - Less than 100 ton. 2 - Between 100 and 500 ton. 3 - Between 500 and 1000 ton. 4 - Between 1000 and 2000 ton. 5 - Between 2000 and 5000 ton. 6 - More than 5000 ton.			Quantity of olives (ton) processed by marketing year
Olive oil produced	1 - Less than 50 ton. 2 - Between 50 and 100 ton. 3 - Between 100 and 200 ton. 4 - Between 200 and 500 ton. 5 - Between 500 and 1000 ton. 6 - More than 1000 ton.			Quantity of olive oil produced (ton) by marketing year
Waiting time before processing Index	1 - More than 15 days 2 - Between 8 and 14 days 3 - Between 3 and 7 days 4 - In less than 48 hours 5 - Immediately after arriving	×	% olives processed	Waiting time before processing index - the higher the index more quickly are the olives processed

Crossing down the marketing clusters with the structural characteristics of the olive mills it becomes clear that the “Production Oriented” mills are the larger ones in terms of processed olives and subsequently in terms of olive oil produced. The olive mills that belong to this cluster process in average between 1000 and 2000 t. of olives per season obtaining around 200 to 500 t. of olive oil.

Table 4: Cluster means for olive mill structural variables

	Cluster		
	1 “Production Oriented”	2 “Sales Oriented”	3 “Market Oriented”
Olives processed	4.19	3.14	2.93
Olive oil produced	4	3.14	2.67
Olive processing time Index	3.97	4.52	4.63

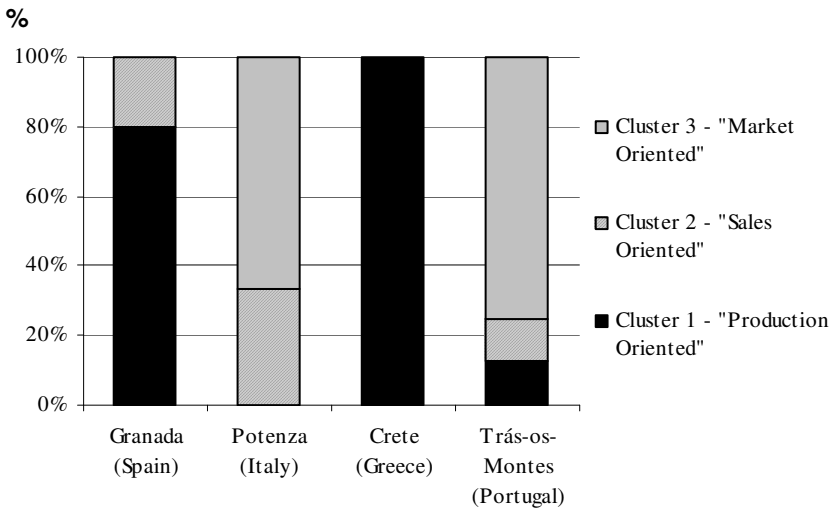
The average of processed olives and quantity of the olive oil produced are slightly smaller for the “Sales Oriented” olive mills than for the “Market Oriented” ones. Both

process in average around 500 to 1000 t. of olives per marketing year, producing around 200 to 500 t. of olive oil.

According to the Waiting time before processing Index the “Production Oriented” firms take longer to process the raw material than the others. Both the “Sales Oriented” and the “Market Oriented” olive mills process the olives immediately after their arrival while the “Production Oriented” take, in average 48h to do so.

Analysing the cluster distribution in each of the target areas (figure 1) is easily observed that all of the olive mills that compose the Greek sample are included in the first cluster – “Production Oriented” as well as the majority of the Granada (Spain) sample olive mills. The olive mills interviewed in Potenza (Italy) and Trás-os-Montes (Portugal) belong mainly to the third cluster “Market Oriented”.

Figure 1: Cluster distribution in the sample per target region (%)



As a final remark it is never enough to emphasise that these results are not generalized as the sample used was very small, only 39 olive mills. However it was possible to analyse some trade and marketing indicators in order to establish similar groups of olive mills according to their trade and marketing activities.

The first cluster - “Production Oriented” olive mills – is characterized by not selling packed olive oil, selling all the production to intermediaries or refinery industries. In this cluster are included the larger olive mils in terms of olives processed and olive oil produced. Despite the inexistence of marketing activities these olive mills are trying to expand their market to new clients and to new geographical areas, and will probably feel the need to pack their production in a near future. If so, this first cluster olive mills will probably change to other clusters, especially to the third one “Market Oriented”.

The second cluster - “Sales Oriented” olive mills – includes those olive mills that although marketing packed olive oil don’t give emphasis to the trade and marketing activities and especially to the search of new clients.

The last cluster - “Market Oriented” olive mills – is characterized by selling packed olive oil, and developing trade and marketing activities all over the year. These olive mills are those closer to the final consumers as most part of the olive oil is sold directly to them and consumers’ preferences are taken into account in the production of the olive oil. The search for new markets and new clients is a reality.

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OLIVERO Project

Contribution to Deliverable nº 25

"Overview of olive oil marketing & processing and olive sector organisation"

Partner 4
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SURVEYS ON OIL MILLS

The analysis of a sample of oil mills completes the socio-economic survey on oil producers in the Italian target area.
The survey was carried out from April through May 2005, but the data refer to the three years 2001-2002, 2002-2003 and 2003-2004.
The questionnaire used for the interviews was prepared by the Portuguese research team and was submitted to a sample of 15 oil mills.

The sample was organized in a logical way.

First, we took into account the **territorial coverage**, in relation to which it was chosen to survey at least 2 mills per each of the 5 project zones falling within the target area. However, in the course of the survey, the most interesting territorial cases required more in-depth investigation. In particular, the recent approval of the product specification for the PDO (Protected Designation of Origin) production in the area of Vulture-Alto Bradano (as reported in the conclusive section of the report) led us to increase the number of oil mills surveyed in this area.

Another important guiding element in defining the sample was the objective of using the interviews as a tool of knowledge, not only of the structural and technological characteristics of the oil mills, but also of the more general conditions and prospects of the whole olive-oil chain in the target area. Olive oil processors were thus considered as one of the **stakeholders categories** of the OLIVERO project that could express their judgement on the possible evolutionary scenarios of SMOPS, on the oil market and the possible effects the change of EU and regional policies may have on the olive sector. To that end, a special role was attributed to the cooperative oil mills. Though not homogeneously widespread in the target area, this type of oil mill expresses the oil producers' will to overcome the fragmentation of the raw material supply and to build a link with the end consumer by integrating the processing phase of the raw material. Moreover, scale economies that are often peculiar to co-operative enterprises allow introducing both product (e.g. quality certification) and process (introduction and experimentation of new technologies) innovations. Finally, the active cooperation support policies in agriculture make this type of enterprise particularly dynamic in the growth

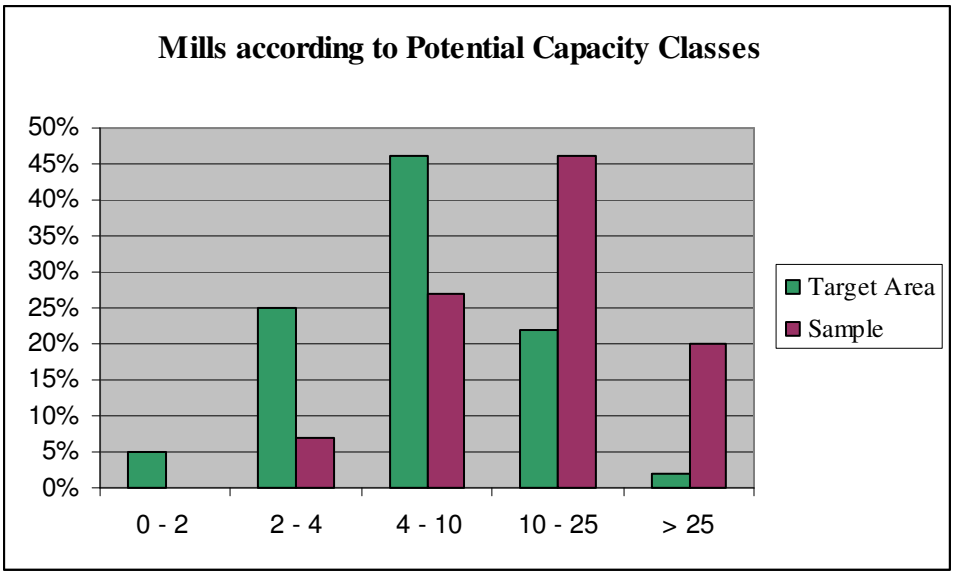
strategies of olive sector, in conjunction with local institutions. All these elements justify the choice of considering co-operative oil mills as a particularly interesting stakeholder category and, consequently, the choice of surveying at least one of them in each of the five project zones, although the co-operative form is not homogeneously widespread over the territory of the target area.

On the contrary, no criteria was imposed relative to the size of the oil mills. The comparison of the sample structure with the structure of all the oil mills located in the target area [6] relative to their potential capacity (PC) to process olives in 8 hours, was made only a posteriori. PC is one of the criteria used to stratify oil mills, and in our analysis, it was assumed as representative criteria of the size of the oil mill, at least relative to its technological characteristics.

The following table and graph show that our sample doesn't include the mills having a minimum PC (up to 2 tons of olives in 8 hours) that represent 5% of the reference whole sample and also the mills of small- (2-4 tons) and medium- (4-10 tons) PC size are underrepresented with respect to the reality. On the contrary, oil mills of greater PC weigh upon our sample more than in the target area. Such a difference between the structure of the sample and the structure of all the oil mills is partly attributable to the small sizes of the sample and partly to the choice of surveying with priority the co-operative enterprises that, on average, are above the small size characterising the olive-processing sector.

Target Area / Sample	**Mills according to Potential Capacity classes (tons of olives/ 8 hours)**				
	0 - 2	**2 - 4**	**4 - 10**	**10 - 25**	**> 25**
Matera	2%	13%	65%	19%	1%
Potenza	5%	22%	49%	21%	3%
Salerno	6%	28%	40%	24%	2%
Target Area	**5%**	**25%**	**46%**	**22%**	**2%**
Sample		**7%**	**27%**	**46%**	**20%**
Source: Agea (2003)					

[6] Such a comparison was possible thanks to the data supplied for the crop year 2002 - 2003 by Agecontrol, which is the Italian agency for EU controls and actions within the framework of olive oil aid system.


Mills according to Potential Capacity Classes
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
0 - 2
2 - 4
4 - 10
10 - 25
> 25
Target Area
Sample

DATA PROCESSING

The data acquired through the survey were mostly processed by using the questionnaire structure and are presented in this report in the following order:

1. **General information**, relative to the legal status of oil mills and the "physical" size of their activity in terms of amount of processed olives, oil produced and traded. This section ends with information relative to the organizational and occupational setup of oil mills.
2. **The production process: technologies and investments.** This section covers, from a technical-economic point of view, the different phases of the production process from the raw material supply to the management of processing residues. It ends with the analysis of investments the oil mills of the sample have performed or are performing.
3. **Relationships with the market.** The sales aspects are tackled both in relation to the characteristics of the product (quality, packaging) and to the type of buyers. The sale-related services are equally analysed.
4. **Marketing planning and strategies.** This section deals with the more general aspects of management, with special reference to marketing, and concludes with the opinions of the interviewees on the difficulties in having access to the market, the assumed solutions and the prospects of product certification pursuant to Reg. 2081/92, establishing the PDO label.

1. General information

1.1 The legal status

The choices made when defining the sample, affect its structure depending on the **legal status** (tab. 1). In fact, 6 out of the 15 mills are co-operative associations and predominantly have a medium-to-high PC. The General Partnership (G.P) legal status ranks second in importance and is represented by 4 mills, 2 of which having a PC greater than 10 tons. It is finally followed by Individual Firms (3) and the Limited Liability Company (Ltd) (2) none of which exceeds a PC of 25 tons.

Table 1: Olive mills according to Potential Capacity and Legal Status

Legal Status	PC Classes (tons of olives/8 hours)					
	2 -4	4 -10	10 -25	> 25	Total	%
Cooperative mills		1	3	2	6	40%
General Partnership (GP)		2	1	1	4	27%
Individual Firm	1		2		3	20%
Limited Liability		1	1		2	13%
Whole Sample	1	4	7	3	15	100%
(%)	7%	27%	47%	20%	100%	

As for the co-operative mills only, table 2 reports the number of members that delivered the olives of the 2003-2004 crop year, its % variation over the three-year period 2001-2004 and the average amount of olives delivered by each single associate. As from the table, the number of associates is correlated to the PC of the oil mills and varies from a minimum of 9 associates (in a firm with PC ranging between 4 and 10 tons) and a maximum of 420 associates in the mills of PC > 25 tons. The two co-operative mills of greater PC are also the ones where the number of associates significantly increased in the three considered years (23% and 35%), whereas in the other cases the number of associates is observed to decrease, to remain stable or increase. The % of processed olives from the delivery of associate farmers is extremely variable between 1% (in the case of the smallest co-operative) and 100%, the same as the average amounts of olives delivered per associate (from a minimum of 387 kg to more than 1808 kg) and, on average, they are equal to less than 900 kg.

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1.2 Quantity and provenance of processed olives

The amount of olives processed during the milling season is another indicator of the size of the oil mills. From this point of view, in the period 2001-2004, the mills of the sample processed quite different average amounts of olives, from about 100 tons to more than 1550 t. The amount of processed olives is quite correlated to the PC of the oil mills (tab 3), if we exclude the case of the only oil mill with a PC smaller than 4 ton that, in the period 2001-2004, milled an amount per year slightly greater than the average of the PC class ranging from 4 to 10 tons. In the successive PC classes, the amounts of olives processed per year considerably increase up to values of about 779 tons (in the average of the PC class between 10 and 25 tons) and 1220 tons (in the class of PC > 25 ton).

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As for the provenance of the processed olives, 3 cases do occur:

a) **The delivery of the raw material by the oil mill associates.** This situation, that was previously analysed for the 6 co-operative firms, is also observed in the case of 1 individual firm and of 2 Ltd. (Limited Liability Company), the owners of which are also olive producers;

b) **the delivery of the raw material by non-associate producers.** As from the survey on the farms, the oil mills offer a milling service to olive producers that partially or totally withdraw the produced oil to be used for family self-consumption and/or to be sold directly to the end consumer. The delivery of olives by non-associate producers is the most frequent type of provenance of the raw material (11 oil mills out of 15) and may constitute the only form of supply of olives (in our sample this occurs at three mills) or be associated in variable proportions to the delivery by the associates of the oil mill and/or the purchase of the raw material directly by the oil mill;

c) **the purchase of olives.** 7 out of the 15 mills of the sample buy olives for processing. This form of supply has a percentage incidence varying from 11% to 100% out of the total processed olives. The only two oil mills that are exclusively supplied with olives

through purchase also operate on off-site markets (partly in the region, partly off-region).

Referring to the 11 oil mills that process the olives delivered by **non-associate producers**, table 4 shows the number of suppliers in the 2003-2004 crop year and their average number in the three-year period 2001-2004. As it is observed for the whole sample, the two data have a similar range (from 20/40 to 1000 producers) but can considerably differ for the single oil mills. In fact, in some cases, the number of olive growers varies from one year to the other, depending on the production rate related to alternate bearing, the climate pattern and the pest attack intensity.

The average amount of olives delivered by each single **non–associate producer** is about 2000 kg, significantly higher than the average amounts delivered by the members of the cooperatives (table 2) although with a quite wide range (524 kg – 4.500 kg).

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1.3 Oil production and the milling service: service-oriented and production-oriented mills

The variability in the level of production of the mills of the sample is still evident if we consider the amounts of oil produced in the 2003-2004 crop year with respect to the three-year average (tab.5). Referring to the first series of values, the amounts of oil produced vary from a minimum of 2 tons to a maximum of 240 tons. On the contrary, as for the three-year averages, a better minimum value (19 tons) and the same maximum value (240 tons) are observed.

The average production levels of the mills of the sample are generally quite correlated to their PC. Of course, the amounts of oil produced also depend on oil yield, the range of which is from 13% to 23%, with an average of the whole sample of about 17%.

Finally, Table 5a shows the average amounts of oil remaining at the mill in the period 2001-2004 (which we defined **net product**) once the olive growers (associates and not) have withdrawn the oil due to them.

Table 5a: Olive oil produced, oil yeld and Net Product according to PC classes

PC classes	olive oil produced (tons)		avg according to PC classes (tons)	oil yeld '01-'04	% olive oil returned to		Net product ('01-'04 tons)
	03-'04	avg '01-'04			Associates ('01-'04)	Non Associates ('01-'04)	
2 - 4	39	55	55	13%	0%	100%	0
4 - 10	90	90	51	20%	0%	96%	4
	4	19		18%	0%	0%	19
	2	36		15%	0%	22%	28
	14	60		18%	0%	21%	48
10 - 25	49	102	142	19%	0%	29%	72
	13	79		16%	100%	0%	0
	208	240		16%	35%	15%	120
	43	98		17%	10%	45%	44
	68	68		17%	0%	38%	43
	54	209		18%	0%	83%	35
	15	199		23%	45%	45%	21
> 25	240	184	198	16%	0%	0%	184
	117	232		13%	20%	0%	186
	150	178		18,50%	26%	14%	107

The net product of the mill of the sample is an even more instable data with respect to their total product: in some cases it is equal or close to zero, on the opposite extreme it reaches one of the highest production levels recorded in the three years (186 tons).

This variation partly depends on the production pattern of the campaign, and partly results from the settlement of the opposed interests between oil mills that tend to retain the highest possible amount of oil and the farmers who establish the maximum amounts of oil to withdraw according to market pattern expectations. In the presence of poor demand and low prices, they are willing to leave the oil at the mill, vice versa they prefer to manage the oil sale directly in case of steady demand. However, it is foreseeable that such behaviour will tend to change once the constraints to the sale of bulk oil come into force. In fact, only the farmers who are able to package oil will have an interest in withdrawing all of their product, whereas the others will end up by keeping for themselves only the amounts for self-consumption, for which bulk oil management is allowed. The interviews made the mills showed that this is already the case for the associates of the cooperatives.

As for the amount of the net product, one additional remark refers to the type of mills. Some of them act as service enterprises rather than production enterprises, in the sense that their

main activity consists in milling on behalf of third parties, in favour of associate or non-associate producers.

Attributing some threshold values to the ratio of the net product to the total product, we can state that an enterprise where such a ratio is lower than 1/3 can be considered as a **service-oriented mill**. At the opposite extreme, a net to total product ratio greater than 2/3 indicates a strongly market-oriented firm, that we defined **production-oriented mill**. The intermediate situations (1/3>net product < 3/2) were defined as **mixed oil mills**, where production- and service-oriented activities do co-exist.

Referring to the farms of our sample, this classification yields the following results (tab.5b).

One third of oil mills falls within the "**service-oriented"** type. The mills of this group are quite heterogeneous both with respect to the Legal Status and the production potential, although the group doesn't include mills of PC > 25 tons. On the contrary, the amounts of oil produced per farm are relatively homogeneous and stabilize at a relatively low level, well expressed by the average value of the group (42 tons).

About half of the oil mills are **production-oriented** (6/15 firms). Also in this group there are different types of Legal Status (except the Individual Firm) but the mills of average (4-10 tons) and maximum (>25 tons) production capacity do prevail; this causes a strong variability in the amounts of oil produced per firm and, consequently, a not very high average production level of the group (71 tons). Moreover, this group includes the two mills (both being General Partnership) that are exclusively supplied with the raw material through the purchase of olives and consequently sell all the oil produced. These two mills thus represent the extreme case of the production-oriented group, also associated with a strong market approach both of the raw material and of the product. Contrary to the previous cases, the group of **mixed** mills (4/15 firms) is the least numerous but more homogeneous, both in terms of Legal Status (the co-operative legal status prevails) and the predominance of the medium-to-high PC class (10-25 tons). The amounts of oil produced per firm are quite high, as shown by the average value of the group, which is considerably higher than the value of the previous groups (117 tons).

Table 5b : Olive oil mills according to Type, Legal Status and PC Class

Type	Legal Status	PC classes	Total product (tons)	Net product (%)
service oriented	Ind. Firm	**2 - 4**	42	0%
	G.P.	**4 - 10**		4%
	Coop.	**10 - 25**		0%
	L.P.			10%
	Ind. Firm			17%
mixed	Ind. Firm	**10 - 25**	117	62%
	Coop.			45%
	Coop.			50%
	Coop.	**>25**		60%
production oriented	L.P.	**4 - 10**	71	78%
	Coop.			81%
	G.P.			100%
	G.P.	**10 - 25**		71%
	Coop.	**>25**		80%
	G.P.			100%

Referring to the whole sample, 13 out of 15 firms have also offered, though to a very little extent, a milling service in favour of farmers (associates or not). As for this activity, it was useful to describe the tariff determination system, their rate, and possibly the differences applied with respect to private customers or the associates of the mill.

In general, in the target area, the payment system based on the amount of olives to be milled is the prevailing one. Only two co-operative mills of our sample that perform the milling service exclusively in favour of their associates are an exception to the rule. In one case, the cost of the milling service is established as % of the oil sold; in the other case, the cooperative purchases all the olives (at 400 €/ton) and resells to their associates the amount of oil they require at a price (4,7 €/l) slightly lower than the average sale price to third parties (4,8€/ l) (data of 2003-2004).

Conversely, in the majority of cases, depending on the zone, tariffs vary from 0.07 €/kg olives to 0,14€/Kg olives. Out of the 8 mills that process both the olives of associates and of non-associate producers, half of them apply differentiated tariffs to they associates (about 9%).

1.4 Oil marketing

The distinction between production-oriented mills and service-oriented mills gives a preliminary indication on the relationship of the farms with the market; this aspect can really be understood only by analysing the whole production cycle, including marketing.

As it is seen in table 6, all the mills of the sample have marketed oil in the year 2003-2004 (from a minimum of less than 2 tons to a maximum of 540 tons) even those having a net product being equal to zero. The latter have faced the lack of net product, partly by marketing the unsold oil of the previous year, and partly by buying it (tab.6).

More generally, 6 mills of the sample purchase oil, thereby totally or partly complementing their own availability in net product: in fact, the incidence of the purchased product varies from 20% to 100%. The purchase of oil is related to the need of exploiting the capacity of packaging plants present in the farm.

Out of the six firms that have bought oil, as many as 5, in turn, have packaged the whole output sold. Out of the 9 firms that have marketed oil exclusively on their own, 5 have sold the whole packaged product, 3 have marketed a percentage of it as bulk (from 40% to 60%) and only one mill has sold exclusively bulk oil. Out of the total of the marketed oil of the sample mills, as much as 92% was sold as packaged.

Table 6: Olive oil marketing (2003-2004)				
PC classes	**Net product (tons) '03-'04**	**Traded olive oil ('03-'04)**		
		quantity (tons)	**bought (%)**	**packaged (%)**
2 - 4	0	3	100%	100%
4 - 10	4	4		100%
	4	204	98%	100%
	2	2		56%
	11	13	16%	100%
10 - 25	35	35		100%
	0	70 (*)	20%	100%
	104	104		62%
	19	30 (**)		100%
	43	43		60%
	9	9		0%
	2	2		100%
> 25	240	540	56%	100%
	94	94		100%
	90	130	31%	75%

(*) bought + last year produced oil
(**) current year + last year produced olive oil

1.5 Organizational and occupational aspects

So far, the size of the sample mills has been expressed on the basis of a technological parameter (the PC) rather than an occupational one that is, indeed, the most widespread dimensional indicator in the statistical sources relative to industrial and services enterprises. The choice of PC as a size indicator was made not only to make the analysis of the sample more homogeneous with respect to the specific sector surveys made by Agea, but also in view of the frequent seasonality of the mill activities. In fact, table 7 shows the non-linear relation between PC classes and the number of persons employed in the sample mills.

In the mills with PC up to 10 tons, the total number of employees never exceeds 5 units and, out of these, a percentage never exceeding 20% is permanently employed. In the mills of the successive PC class (10-25 tons), the numbers of employees is only slightly higher (on average 6 units), the same as the relative incidence of those permanently employed (less than 25%). On the contrary, the transition to the upper PC class (> 25 ton), corresponds to a net increment in total employees (on average 16) and in permanent employees (50%).

Table 7 : Employees average units according to Mills' PC Classes				
PC classes	Employees			
	Total	permanent	temporary	% permanent
2 - 4	5	1	4	20%
4 - 10	4,8	0,8	4	17%
10 - 25	6,3	1,4	4,9	22%
> 25	16	8	8	50%

It is not always possible to specify the job tasks performed by each employee (tab. 8). Especially in smaller mills, the same person, generally the owner or the manager of the mill, is permanently in charge of management and administration and, more discontinuously, of marketing.

Conversely, in the enterprises having PC > 25, the management and administration task is performed by more than one employee and, in particular, it is well separate from the marketing function. As for the employees involved in marketing, the average data of the group is considerably affected by the occupational values of a single firm that relies upon an extended and permanent sale labour force.

On the contrary, the production activities are predominantly performed by temporary employees in all the mills of the sample. In mills having a PC smaller than 25 tons, a production manager is rarely present and he often coincides with the owner or a more experienced and qualified worker. Whereas, in the mills having a PC > 25 tons, the production manager is a separate unit from the workers and, in general, his activity goes beyond the olive processing season that, on average, covers approximately 70 to 80 days per year.

Table: 8 Employees: average units according to job task and Mills'PC classes								
PC classes	Direct.+ Administration		Marketing		Production			
	Total	Permanent	Total	Permanent	Total	Permanent	Manager	Workers
2 - 4	1	1	1	0	3	0	0	3
4 - 10	1,3	0,8	0	0	3,5	0,2	0,2	3,5
10 - 25	1,9	1	0,4	0	4	0,3	0,3	3,7
> 25	2,7	2,7	4,3	4,3	9	1,3	1	8

2. The production process: technologies and investments

2.1 The supply of the raw material

As for the supply of the raw material, the mills of the sample strongly rely on local supply. Table 9 shows that the local origin of olives is quite predominant with respect to the purchase of the raw material from other zones of the region or off-region. As stressed in the previous section, the supply is rarely made through purchase but rather through the delivery of local producers (associates and not). In fact, only two mills totally buy olives off-zone, whereas one third addresses to the external market only to complement local supply.

Almost in all cases, upon delivery to the mills, olives are visually inspected to determine their quality. Three mills are an exception: in two of them, some samples are analysed to determine the organoleptic characteristics, in the third one, analyses performed only to detect the presence of any plant protection product. The time elapsing between the arrival of olives to the mill and their milling is quite reduced (tab.10): in 9 out of the 15 mills, more than 70% of olives are immediately milled and, except in three cases, the amounts of olives milled within 48 hours or even in one-week time are quite residual with respect to the total. The rapidity by which olives are sent for processing confirms what observed about the positive effect the territorial diffusion of mills produces (almost each single municipality of the target area has at least one mill) (Campania Region, 2001). The waiting time for olives to be milled depends on the need of milling olives of different places of origin and quality separately, as well as on the different processing capacity of mills. We should remind here that our sample is relatively unbalanced in favour of the medium-to-high potential capacity mills; therefore, it is not by chance that the only mill of smaller size processes as much as 60% of olives beyond 56 hours.

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The supply system of mills is reflected in the varieties of olives processed, which partly consist of traditional genotypes and partly of cultivars more recently introduced in the production zone. Table 11 shows the main olive varieties (the incidence of which is at least 30% greater than those processed in each mill), distinguished into traditional and not. As from the table, each of the 5 project zones boasts the presence of local varieties that characterise the oil although mills rarely have single-variety processing lines. In the cases where the supply is off the production zone, the mills buy those olive varieties that give the oil a special taste (Coratina is used to give spicy taste) or to rectify any fault (off its production zone, Maiatica is used to sweeten the oil).

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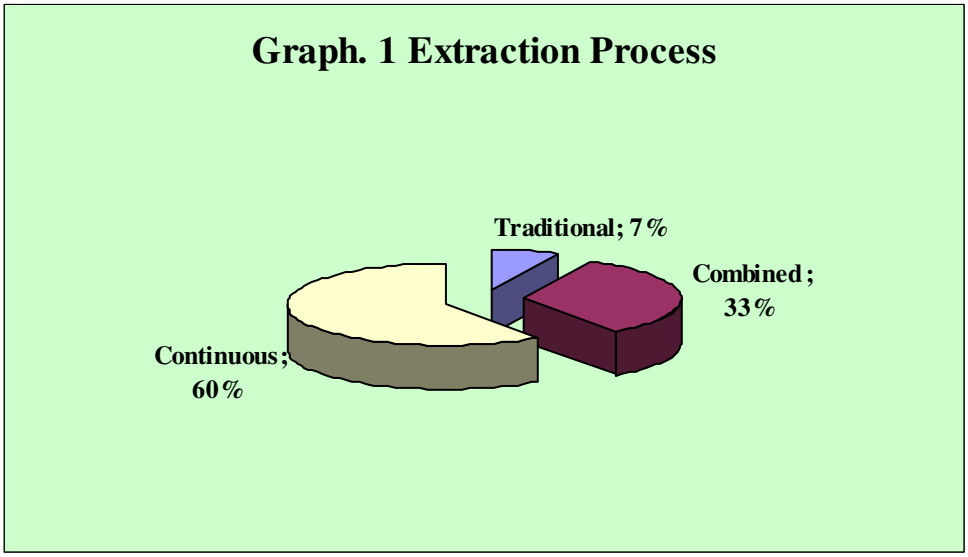
2.2 Extraction technology

The extraction technology is (tab 12) the second element of the production process we considered. Only one mill of the sample, the one of lower production potential, adopts the traditional system, whereas the 5 other mills combine traditional pressing (with stone-olive mills) with automation of successive phases (continuous combined system). As a whole, however, the integral continuous system does prevail (9 out of 15 mills). The interviews highlighted that the adopted technology is closely dependent on the period where the oil mill was set up or, possibly, modernized. In particular, the integral continuous system has widespread especially in the ‘80s and the ‘90s, whereas the mixed solution consisting of the combined continuous system is being adopted again.



The only **traditional** extraction oil mill works with two **presses** and has a real capacity of 3.25 q/h and a potential capacity of 3.75 q/h, the plant is thus being used at 87% of its working capacity.

Among the mills using **the integral continuous** system, only one is dual phase. The potential hourly capacity of the continuous plants range between 0.7 tons/h and 4 tons/h; also the real to potential capacity ratio is quite variable, from 67% to 90%.

Out of the 5 oil mills that use the **combined continuous** system, as many as 4 are triple phase. The hourly potential capacities of this group are smaller in range (0.2-0.4 tons/h) than the previous one and also the degree of real maximum power use is around 72% and 80%.

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2.3 Oil storage and bottling

The average storage capacity of the sample oil mills is about 138 tons but its range of variation is quite wide: from a minimum of 3 tons to a maximum of 600 tons (tab. 13). In general, a correlation is observed between the storage capacity and the relative production potential of extraction.

As for the types of containers, table 11 shows, in general, that stainless steel is the most commonly used material for storage and, in particular, tanks are the most commonly used containers: almost 80% of the oil is preserved in stainless steel tanks. Any other type of container is rarely used, especially if it is not stainless steel. Silos are equally present in only

three mills but, due to their large capacity, their incidence on the total of oil stored at the sample mills increases.

Table 13: Olive Oil stocking

PC Classes	Average. Stocking capacity (tons)	Individual Stocking capacity (tons)	Containers (% oil)					
			Stainless Steel Drum	Stainless Steel Containers	Stainless Steel Tanks	Resin Tanks	Stainless Steel Silos	Cement Barrel
2 - 4	3	3	100%					
4 - 10	65	30		100%				
		120			100%			
		50			100%			
		60					100%	
10 - 25	73	120			100%			
		60			100%			
		114			100%			
		30			100%			
		86				100%		
		54					100%	
		44	100%					
> 25	431	600			100%			
		500			100%			
		194					74%	26%
Whole Sample	**138**	**2065**	**2%**	**1%**	**77%**	**4%**	**12%**	**2%**

Most of oil mills (13 out of 15) are provided with packaging plants complete with capping machines (tab. 14) but only 8 oil mills have also label application machines (in other mills this operation is hand-made).

The type of bottling plant is somehow related to the production capacity of oil mills. In fact, the mills of a low and medium production capacity are equipped with semi-mechanised plants that package, on average, about 400 bottles/hour, independently of the size of the bottle. In mills with PC > 25 tons all the bottling plants are fully mechanised and bottle, on average, slightly more than 1.000 bottles/hour.

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2.3 Handling of processing residues

Handling processing residues is an increasingly important worry to the mills due to the regulations that forbid their uncontrolled disposal into the environment. Almost all the mills of

our sample (tab. 15) dispose vegetable waters through spreading them free of charge on agricultural land (olive grooves, meadows, pastures, etc.) that may in some cases belong to the associates (both in the case of co-operative mills or firms related to the agricultural activity of the owners) and in other cases may belong to third parties.

Olive oil processors perceive the cost of disposal of residual waters as a cost of labour employed for gathering, transporting and spreading and it varies from a minimum of 0.2% of the cost of labour to a maximum of 10%, depending on the distance of agricultural lands from the oil mill.

The most widespread solution for disposing oil pomace is to sell it to the only plant for the processing of pomace present in the target area (close to Vulture Alto Bradano) at a price of 6 €/ton. The sale of pomace, in fact, barely covers its carriage; actually, if carriage is charged to the pomace processing plant, pomace is given free of charge.

An exception to these disposal systems of processing residues is a large co-operative oil mill located in a park area (Montagna Costiera) where a project is being implemented for producing compost from residual waters with the addition of manure and other organic material. Therefore, also in this case, spreading on agricultural land as fertiliser is the final outlet of residual waters. The plant is still at the experimental phase and a compost production scale that makes the operation of the plant profitable is being setting up. Prospectively, the cooperative oil mill is equipping itself to offer the disposal service to all the operators of the zone and not only to the associates.

Table 15 Handling of processing residues

PC Classes	Use of vegetable waters	% vegetable waters getting rid on labour cost	olive husks destination	Price (€/ton)
2 - 4	Spreading over agricultural fields	7%	sale	200
4 - 10		10%		20
		5%		0
		5%		40
		5%		50
10 - 25		3%		30
		5%		60
		10%		87
		5%		60
		10%		0
		3%		50
		5%		0
> 25		5%		0
		0.2%		20
	Blended in composting process	5%	Blended in composting process	

2.5 Investments

In the last five-year period (1999-2004) the mills of our sample have made some investments, which is quite probably correlated to the parallel dynamism of the olive sector, as confirmed by the increase in the supply of the raw material in the provinces of the target area and the investment activities emerging from the socio-economic survey on olive growers (Favia, 2005).

As many as 12 out of the 15 oil mills of the sample enlarged or restructured their own activity, and 3 of them did it without applying for public funding (tab.16).

The amount of investments per each single mill is quite variable, from a minimum of 50 thousand euros to a maximum of 2 million euros, whereas the incidence of public funding varies from 40% to 75%.

In general, both the invested capital and the percentage of public funding are proportional to the production potential of the oil mills, except the group of PC class ranging from 10 to 25 tons.

This group shows to have the highest incidence of oil mills that have made no investment in the five-year period, and the minimum average value of invested capitals (276 thousand euros) and the least use of public funding, only for 2 mills out of 5 that made investments.

Table 16 : Investments and Public Funding (1999- 2004)

PC Classes	Total investment Amount (€)	Public funding (%)	average	
			amount (€)	Public funding (%)
2 - 4	75.000	75%	75000	75%
4 - 10	-	-	446.667	61%
	90.000	75%		
	500.000	75%		
	750.000	50%		
10 - 25	50.000	-	197.143	33%
	-	-		
	50.000	-		
	-	-		
	700.000	40%		
	230.000	-		
	350.000	50%		
> 25	300.000	50%	1.100.000	65%
	2.000.000	75%		
	1.000.000	50%		

All the mills that made investments in more than one sector (tab. 17) and, in particular, the mills with PC > 25 tons have modernised/enlarged almost all the plants. However, the greatest investments were made in more traditional sectors (buildings and extraction lines), followed by modernization/enlargement of the storage and bottling systems. A smaller number of mills invested on more innovatory solutions of the production process: only two oil mills implemented an olive and oil analysis system and 5 mills established treatment plants for processing residues.

Table 17: Sectors of Investment (1999-2004)								
PC Classes	**Mills**	**Buildings**	**Reception yard**	**Extraction line**	**Warehouse containers**	**Packaging line**	**Analisys**	**By-products Treatment**
2 - 4	1					1		1
4 - 10	4	3	3	2	2	2	1	1
10 - 25	7	5	2	5	3	3	0	1
> 25	3	3	2	3	3	2	1	2
Whole sample	**15**	**11**	**7**	**10**	**8**	**8**	**2**	**5**

The investment trends analysed for the past period are partly confirmed also in the investment forecasts of the next future. Table 18 reports the sectors for which the firms of the sample have planned or started investment activities: firstly the storage plants immediately followed by the extraction lines, the buildings and packaging plants. Less investments are made on analysis laboratory and waste treatment plants.

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3 The relationship with the market

3.1 Oil marketing: packaging and oil quality as decisive factors for determining the sale price

Product packaging is a key element for marketing, both because it is the first contact with the consumer and because it is the vehicle through which information on the product (origin, brand, quality, recommendations for use, etc.) is conveyed.

Graph 2 shows the percentage distribution of the forms by which oil is marketed: bulk, bottles, tins, whereas table 19 specifies the type of containers the mills of our sample use for marketing.

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Most of the mills that package oil adopt both solutions in different proportions. Only the smallest oil mill of the sample exclusively markets bottled oil[7]. In the PC class from 4 to 10 tons, the % of bottled oil is about 32%, quite similar to the percentage observed for the oil mills with PC > 25 tons (33%). On the contrary, in the medium-to-high PC class (10-25 tons), the average incidence of the bottled product drops to 16%. In fact, this group includes the only oil mills that exclusively sell bulk oil and those who sell the product to traditional intermediaries, which results in a quite peculiar marketing model.

Apart from the quality of the marketed oil, the packaging type strongly influences the sale price. In the average of the sample, the oil in bottles is sold at 6.4 €/l against 4 €/l for the tins. Referring to the average prices at each single mill, the range for the bottled oil (from 3.5 €/l to 9.3 €/l) is much wider than for the price of oil in tins (2.7 €/l -5€/l), the quality of which is, in general, more homogeneous in quality.

[7] It is an oil mill that processes olives for third parties and subsequently buys oil from other oil mills for it to be re-sold and labelled.

Table 19: Packaged Olive Oil and sale price according to packaging type

PC classes	Packaged olive oil (lt.)	% labelled bottle	Average Price €/lt)	% Printing tins	Average Price €/lt)
2 - 4	3.000	100%	8,2	0%	-
4 - 10	3.500	20%	8,9	80%	4,0
	203.600	40%	3,5	60%	2,7
	1.000	40%	9,3	60%	5,0
	12.800	30%	5,0	70%	5,0
10 - 25	35.000	10%	4,0	90%	4,0
	70.000	1%	5,4	99%	4,6
	64.000	31%	5,4	69%	4,5
	30.000	1%	4,5	99%	4,5
	25.500	40%	6,3	60%	3,8
	9.000	0%	0	100%	4,0
	1600	30%	7,3	70%	5,0
> 25	540.000	30%	7,3	70%	4,0
	93.500	30%	4,8	70%	4,6
	97.500	33%	9,3	67%	4,9
Whole sample	**1.188.400**	**29%**	**6,4**	**71%**	**4,0**

In determining the price of one litre of oil, the oil quality is however a subordinate factor with respect to packaging. Table 20 shows the interaction of these two factors. In particular, it is observed that:

- The bigger the size of the containers, the lower the average price per litre;
- Tin packaging is only used for un-certified (virgin and extra-virgin) oil;
- The price differential between the virgin and extra-virgin oil in tins varies from 33% to 45%:
- Sometimes the virgin oil is packaged also in bottles of 1 litre or 0.75 l, and the price per litre of virgin oil of the latter reaches 5 €/litre;
- Bottles of a capacity smaller than 0.75 l are used for extra-virgin oil, either certified or not.

As for the uncertified extra-virgin oil, its price greatly and progressively increases with the size of package: being =1 the price of packages of 1 litre (5 €), the price of smaller packages

is 42% greater (for the bottles of 0.75 l), 60% (for those of 0.5 l) up to 140% for the bottles of 0.25 l.

The size of the bottle is then more decisive than the quality of oil and this is especially true for organic oil that, package being equal, is sold more or less at the same price as the non-organic one.

On the contrary, the PDO designation, is mostly appreciated by the market and the oil mills get a price as high as 50% more than the simple extra-virgin oil and, in the case of double certification (PDO and organic) price shoot up to 80%.

The survey on oil mills thus confirms all the uncertainties about the profitability of organically produced oil previously observed during the survey on olive producers: the price of organic oil (on average 6.4 €/l when sold at the oil mill, against an average price of 6 €/l at the farmer) doesn't compensate for the production costs and stays significantly below the EU labelled product: the average price of PDO reaches 8.7 €/l, in line with the average price observed at the national level for PDO oils (Ismea, 2004)).

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3.2 Olive oil market: types of buyers and sale services

The end consumer dominates the market of the oil mills of our sample, as a percentage of the totally marketed oil, and absorbs 2/3 of the product (Graph 3). A smaller and quite similar percentage is absorbed by restaurants and large-scale distribution (LSD). The traditional agents represent a quite marginal type of buyer (12%).

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The importance of the end consumer is evident from the fact that all mills, but one, directly sell their product in a percentage varying from 10% to 100%. Among the mills that directly sell to the consumer, 12 of them market the packaged product, both in bottles and in tins (Tab.21).

Direct sale is a further signal of how strongly oil mills rely on local markets. Being so rooted in the local market is certainly a constraint since it is associated to the difficulties of the mills to export their product. During the survey on oil mills, we tackled such a matter both with the producers and their professional associations and it came out that the opening up attempts of local markets to export – as promoted through the European action (1994-1999) for multi-regional measures – basically failed. In fact, in that period, the establishment of the Macro Commercial Organizations between the main oil producing regions of southern Italy was funded for the implementation of common storage centres. The concentration and rationalization of the supply was also the pre-condition to start applying oil traceability systems required to enhance oil origin, its genuineness and its quality on markets far from the production area.

Interviews to authoritative persons pointed out that the strong segmentation of production into numerous small local, geographically and culturally isolated systems was the main obstacle to the success of this action for the producers of the project zone. The latter, in turn, consist of olive-growing farms of such a small size that they are mainly oriented to self-consumption or to the local market; consequently, oil mills as well are scarcely interested in embarking in traceability projects. In fact, the local market is based on the direct and fiduciary relationship between the producer and the consumer that makes any formalization of the chain steps useless. The latter factors (isolation of local systems and fiduciary production-consumption relationship) also has some advantages for the producers of the marginal areas which reflect on a price of sale that, though not covering production costs, is certainly higher than the price of the oil sold on large-scale markets (national and international) and marketed by big bottling firms that mix oils of different and sometimes unknown quality. On the other hand, for the marginal sloping land olive systems, the access to niche markets outside their territory would require large scale innovations at all the steps of the chain, both in its technological and organizational-institutional aspects that can be easily achieved thanks to the small scale of the production system. Indeed, scale economies that justify such deep and radical innovations could be achieved at the level of the whole local economy. Therefore, for these systems, enhancement of the product as one component of the variety of resources the territory can offer (nature, environment, landscape and historical-cultural beauties) is the set route in response to the demand of that segment of the tourist market that links food consumption to a more complex cultural experience. In a word, it is a matter of importing the consumer rather than exporting the product.

From this point of view, it is quite interesting to note that evolution in this sense is expected when looking at the numerous mills of the sample (10 out of 15) that sell oil to catering firms although each of them thereby trades a small amount of product (less than 20% in the average of the sample). As many as eight out of 10 mills sell oil to restaurants in tins and 4 also in bottles. The producers to restaurants relationship is thus a mutual form of enhancement that diversifies the local market though maintaining the specificity of production and the fiduciary relationship through which production-consumption takes place. Moreover, restaurants are mainly oriented to purchase virgin oil that thereby is much more enhanced than through large-scale markets.

Again referring specifically to virgin oil, we learned that a single mill of the sample sold the product to a multinational firm of production and distribution of cosmetics, which is another form to enhance oil of lesser food value. This case was classified as trade relationship with the large-scale distribution (LSD).

The importance of LSD as a buyer of the oil mills of the sample is an additional signal of the evolution of their market, although it absorbs only 12% of the whole amount of oil traded and is a channel of sale that involves only 6 mills. Beside the previously reported case, 5 additional oil mills sell packaged oil to the large-scale distribution and in average amounts higher than those observed in the case of restaurants (the quota of oil sold to large-scale distribution (LSD) by each single oil mill is always greater than 20% of their sales and in one case it reaches 90%). In fact, the commercial relationship with the LSD calls for the oil mills to guarantee a high standard and especially constantly high amounts. In rare cases local entrepreneurs actively search for this channel of sale to differentiate their outlet markets. On the contrary, the LSD looks for new supply markets to differentiate its supply and, consequently exerts a strong bargaining pressure on local oil mills.

Finally, only 2% of the traded oil is sold to traditional intermediaries. Differently from the other channels of sale that are transverse to the size of the mills (expressed by their potential capacity), only 3 mills of a PC ranging from 10 to 25 tons trade through traditional agents. The product is sold in bulk or packaged in tins and this justifies the low percentage the whole group of mills trade in bottles.

Also in the commercial relationship with the traditional agents, the latter are the ones that search for the supply markets in favour of bottling firms off the production area. In this case, the amounts and quality supplied by each oil mill is quite variable.

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The relationship of the oil mills with the different types of buyers also reflects on the sale-related services (tables 22a and 22b).
In fact, the end consumer never asks for a formal document proving the oil quality, by virtue of the fiduciary relationship that links him to the producer. Sometimes, the producer spontaneously exhibits the quality analyses to prove the good quality of his product. On the contrary, analyses on acidity, peroxides, absorbance and organoleptic characteristics (performed always at external laboratories) are required mainly by the LSD (4 cases out of 5[8],) and possibly offered also to oil mill's buyers (traditional agents and restaurants).

Much more frequent is home delivery that is guaranteed by 11 out of 15 oil mills mainly to end consumers and restaurants. They perform this service using their own vehicles or by renting (especially in the case of smaller oil mills). Mills of greater production potentials systematically use both methods and, in one case, the commercial policy of the firm aims at enlarging its market and guaranteeing free delivery all over Italy.

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Table 22b: Sale Services: Mills offering Home Delivery

PC Classes	Mills	Home delivery	Transport Means	
			owned	rented
2 - 4	1	1		1
4 - 10	4	3	2	2
10 - 25	7	4	2	3
> 25	3	3	3	3
Whole Sample	**15**	**11**	**7**	**9**

[8] Remind that out of the 6 mills that sell oil to the LSD, one of them market virgin oil for cosmetic use for which the analyses of the food quality is not relevant.

4. Marketing planning and strategies

4.1 Work planning

Few mills of our sample adopt explicit planning criteria, though in the absence of a formal document. In most cases, indeed, planning is implicit and dictated by the know-how and knowledge of the technological characteristics of the plants. Table 23a reports the main guiding parameters of processing planning, on the basis of the importance the interviewees attribute to them.

Table 23a: Planning work parameters according to PC classes

PC Classes	Mills	processed olives quality	processed olives quantity	Customers' requirements compliance	Type/quality of olive oil to be produced
2 - 4	1	1			1
4 - 10	4	3	2	3	1
10 - 25	7	6	5	3	2
> 25	3	2	3	1	2
Whole sample	**15**	**12**	**10**	**7**	**6**

The technology-oriented management of oil mills stems from the importance attributed to the raw material as a factor affecting the processing. The quality of olives ranks first in determining work planning, immediately followed by their quantity which is of increasing importance with the increase of the processing potential of oil mills.

However, the two other parameters of some importance (customers' expectations and the quality of the oil to be produced) are related to a vision of the processing that takes into account the relationship between the enterprise and the market. As shown in table 23 b, the former parameter is taken into consideration more by the production mills than the service mills whose prevailing activity consists in offering a milling service to farmers.

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4.2 Sales and marketing: present state and prospects

The mill type is the best aggregation criteria of the firms of the sample to assess their attitude towards marketing. Table 24 shows the average scores the interviewees attributed to a number of elements proposed to them as factors affecting processing activity. The importance of plant performances and the quality and quantity of olives to be processed is confirmed for the whole sample, whereas consumers' preferences are attributed a lower score. This results list doesn't change a lot when considering the types of oil mills though it is noticed that the interviewees attribute poor importance to tradition and know-how of the production process in the case of oil **service-oriented mills,** contrary to what happens in mixed mills, interviewees attributed the highest score to tradition and know-how and the minimum to the consumer's preferences. Consumers' preferences are attributed a low score also by the managers of **production-oriented oil mills** (though their evaluations are slightly better than the other interviewees) who unanimously expressed the highest score for the quality and quantity of olives to be processed and attributed due importance also to the regulations on production.

A still lower variability is observed between the three groups of oil mills as for priorities attributable to marketing strategies (tab. 25) that are mainly oriented to improving the quality of the produce, increasing sales and maintaining good bargaining relations with customers. Lesser attention is recognized to strategies searching for new areas of activity and differentiation of the product through investments on packaging and the brand name.

Table 24 - Most important items of olive oil activities: average scores according to mills' type *

Items	Mills'Type			
	Services	Mixed	Production	Whole Sample
Technological performances of the olive mill	1,4	1,5	1,2	**1,3**
Quality and Amount of available olives	1,4	2,0	1,0	**1,4**
Tradition and personal know-how about production	2,6	1,0	1,7	**1,8**
Regulation on olive oil production	2,0	2,5	1,3	**1,9**
Need to have a profitable activity	1,8	1,8	2,0	**1,9**
Preferences of olive oil consumers	2,2	3,0	2,0	**2,3**

* = judgments (1- very important; 2 - important ; 3 - not important; 4 - less important …)

Table 25 : Most important marketing strategies: average scores according to mills' type *

Strategies	Mills'Type			
	Services	Mixed	Production	Whole Sample
Olive oil quality improving	1,4	1,3	1,3	**1,3**
Sales Increasing	1,0	1,3	1,8	**1,4**
Customer relations improving	1,6	1,5	1,3	**1,5**
Sell olive oil at best price	2,0	2,0	2,0	**2,0**
Shared trading and promotion initiatives Development	2,0	2,3	2,3	**2,2**
New business opportunities finding	2,2	2,5	2,3	**2,3**
Investment on package and / or brand making a competitive differentiation	2,8	2,3	3,0	**2,7**

* = judgments (1- very important; 2 - important ; 3 - not important; 4 - less important …)

Table 26 shows the marketing activities performed by the firms of the sample.
Regular contacts with the customers, activities related to the graphics of containers for oil packaging, participation in exhibitions, price analysis and advertisement initiatives are the most common and regularly implemented activities especially in the **production-oriented and mixed mills.** All the other marketing functions are much less common, except the search for new prospects of activities which is a rather important aspect to those running service-oriented mills, whereas managers of production-oriented mills consider the search for new suppliers for technological innovation of the plants as a major priority.

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In most cases, marketing activities are performed autonomously, using the personnel in charge of management/administration and sales which is more permanently employed over the year. However, for some functions (as the graphics of containers, advertisement initiatives and the development of new brands) there are no adequate skills available within the mill organization and they have to rely on external consultants. On the other hand, although in many cases the interviewees think the marketing function needs to be strengthened (tab. 27), very few of them would be able to employ staff exclusively devoted to this task, especially in service-oriented mills.

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Many interviewees expressed the need to enlarge and diversify their own market, in the case of service-oriented mills and especially the mixed ones (tab. 28) but, in the course of the interviews, such prospects proved to be ideal rather than realistic. Conversely, some production-oriented mills already operate on markets other than local and they aim at consolidating their production rather than further enlarging and diversifying it.
In general, the markets of northern Italy and northern Europe are the most attractive ones, but somebody thinks that the best prospects are in Asian and North America countries that are emerging as olive oil consumers.

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Obviously, all the interviewees indicated the extra-virgin oil as the type of product with the highest and still unexploited market potentials. Most of the mills of our sample do not plan to

base their marketing strategies on the differentiation of their brand, and only some of them are willing to enter the market of the certified product with slight predominance of PDO over organic (tab.29).

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4.3 Access to the market: problems and solutions

The final section of the interview referred to oil producers' opinions about the wider market prospects, the enterprises' difficulties in getting in a profitable positioning and their judgement on the experiences of product certification.

Tab. 30 illustrates the major problems pointed out by entrepreneurs to the actions proposed to solve them.

Only in few cases, a very real problem refers to the situation of each single mill (for instance the financial difficulties resulting from failure to collect debts from customers) or, to the other extreme, the situation of the olive oil sector as a whole (for instance the excessive and growing regulation system).

On the contrary, the interviewees have pointed out to matters concerning the single production systems where they operate and, firstly, the logistic difficulties (5) resulting from the distance and the geographic isolation of sloping and mountainous olive production systems with respect to the domestic and international markets that are increasingly perceived as complex and competitive (3). Such difficulties are increased by the poor knowledge the consumers distant from the production have about the specificity of the local product (4), by the small size of olive territorial systems (2) and the lack of co-operative relations between local stakeholders (2).

On one hand, the lack of co-operation is a relatively important problem, on the other hand, the development of co-operative relations is considered to be a fundamental solution to the difficulties of access to the market, both to overcome the logistic constraints, and establish a local product reputation, as well as to face external competition. Few mills have expressed individual solutions to their problem of access to the market (to hire a marketing expert) or their wish for a stricter legislation on the import of oil of low cost but dubious quality.

As for the small amounts of oil produced and marketed by the mills, collective solutions were proposed: getting over the individualistic attitude of farmers (who tend to manage their

product individually rather than place it at the oil mills) and recovering abandoned olive grooves.

Moreover, proposals mostly came from the managers of the medium-to-large size mills, whereas in the case of smaller ones, we perceived that, somehow, they are accepting the things as they are and, so to say, they think of getting by as far as possible.

Finally, all the 15 interviewees stressed the role of institutions at any level, and blame them for their poor role in protecting and helping the olive sector.

Table 30: Problems of access to the market and proposed solutions

Problems		Solutions			
Debt collection	**2**	None			
Excess of regulations in the sector	**1**	**1**	Regulatory and administrative simplification		
Weakness of local cooperation	**2**	**4**	Development of cooperative relations and chain associations		
Logistic problems	**5**			**1**	Development of transport infrastructures
Poor knowledge of the local product	**4**	**5**	Collective actions to promote the local product	**1**	Hiring a marketing expert
Competitive market	**3**			**1**	Regulate oil import
Small production size of the production area	**2**	**1**	Modifying the attitude of agricultural producers		
		1	Recovery of abandoned olive grooves		

4.4 Collective initiatives to enhance olive oil: the case of PDO certification

As for the problems of co-operative relations as a solution to the weaknesses of local chains and as an instrument for commercial enhancement of quality production, the interviewees referred to the "Consorzi di Tutela" (The "Consorzio di Tutela" is the responsible entity for the promotion of the PDO certification) of PDO production.
At the date of the survey, 3 out of the five zones are involved in the certification procedures.

The "Montagna Costiera" is entirely involved in "**PDO Cilento"** established as early as in 1997. However, in this zone, the "Consorzio di Tutela" of the EU brand is still to be defined because of the conflict between the two opposing positions about who has to represent the chain. Representatives of both parties were interviewed during the survey. On one hand, a large olive producer co-operative claims the supremacy of having believed and promoted the Cilento brand, as representative of the interests of the farmers and holds the opposite party responsible for leaning towards the oil processing party (the olive oil processors). In our sample, the opposite position is backed by the owner of a small individual oil mill. The interviewee has pointed to the need for the "Consorzio di Tutela" to represent a much larger audience of operators of the sector and attributes to the cooperative the fault of pursuing commercial interests and policies restricted to a single, though large, production reality. Nevertheless, the two interviewees agreed with the expectations that once the Consortium is set up, it will work to spread a co-operative-oriented approach between local actors and to reduce the cost of oil certification.

Also the **Sele –Tanagro** area is involved, at least for the farmers falling on the slopes of the Province of Salerno, in the "**PDO Colline Salernitane"** certification, equally established in the late '90s. According to their product specifications, olive-producing areas that fall in a much wider area extending from more marginal lands of inland sloping lands (corresponding to the project zone) down to the coastal hilly area are eligible for certification. Again, in this case, the "Consorzio di Tutela" was established late (at the end of 2004) due to the small number of associate olive growers and those of the inland zone in particular. Such a situation induced the *Comunità Montana* (Mountain Community) Tanagro to test a form of certification stated in the Italian legislation for the recognition of local typical food products: la *Denominazione Comunale (De.Co).* In the *Comunità Montana* view, the De.Co was precisely

established to stimulate local producers to be certification-oriented, thus making procedures simpler and less costly in view of joining the EU brand in future.

At present, since the two certifications together are not allowed by law, the De.Co is an "alternative" to PDO and by large preferred by the operators of Tanagro who claim that the certification costs for PDO are prohibitive to small producers, as it came out during the survey on olive-growers of the area and confirmed by the interviews on the mills. That is the reason why we included in the same sample also the mill hosting the registered office of the "Colline Salernitane" PDO Consortium. To date, the Consortium represents 67% of approximately 100 producers who adopt the PDO, which is a very small amount with respect to the number of potential PDO producers. In the interviewee's opinion the interviewee, the main cause of the high cost of certification is to be attributed to the strong fragmentation of olive-groves and to the small productive size of farms. and their high production costs. In his opinion, the profitability threshold to comply with the product specifications is about 10 tons of oil per farm that, indeed, is hard to be achieved in a situation where the average size of olive groves is less than one hectare. The cost of certification per litre of oil would vary from a minimum of 0.25€/l, for large amounts, up to a maximum of 1 €l, for small amounts.

Finally, in **Vulture-Alto Bradano** the certification process is still under way: in fact, the national procedure for the approval of the product specifications of **PDO Vulture** has just been completed but the steps leading to their EU recognition are still unfinished.

The whole process was not so straightforward. In fact, about 10 years ago, the proposal had been advanced to establish a single PDO for the production of oil from Basilicata Region, with specific sub-mentions for the two zones (Vulture and Colline Materane) that show production peculiarities related also to the traditional varieties grown there (respectively *Ogliarola del Vulture* and *Maiatica*). The Ministry of Agriculture did not approve the two sub-mentions and the regional certification process was started again but producers of both zones were quite sceptical about it. In particular, shortly after, a number of operators of Vulture succeeded in having the product specifications of the homonymous PDO approved and olive groves of a very localized territory (7 municipalities falling in the C.M. Vulture) were admitted as eligible. So, the extent of the production zone of PDO Vulture is quite limited not only with respect to the Basilicata region but also to the production zone of DOC (Denominazione di Origine Controllata) wine Aglianico del Vulture that, together with oil, is the product the Vulture-Alto Bradano zone is most suitable for. The cooperative approach and the dynamism of promoters made it possible to get a very specific PDO but this divided the producers of Vulture who only

partly joined the specifications, despite the effort of the Chamber of Commerce of Potenza to bear the cost of certification for three years. Within the framework of the sample, we collected the opinions of one of the PDO promoting mills, of one of those who refused to join it and of the one who was excluded because it fell within a non-eligible neighbouring municipality. In these last two cases, the interviewees insist on the validity of a single regional certification that, which is however following its course, though slowly.

During the survey, we discussed about the regional certification also with the other Basilicata entrepreneurs of the other typical zone of production, the *Colline Materane*, and with those of the neighbouring inland Mountain, where *Maiatica* variety is grown. The entrepreneurs of the area of Matera, in particular, felt to be wrong-footed by the Vulture's choice to differentiate itself from the regional PDO, but they share the idea of adopting the latter solution since small amounts of oil are delivered to the inland market of Basilicata region where self-consumption tradition is deep-rooted and consistent with the extreme fragmentation of olive-grown areas.

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ANNEX