COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 9.11.2007
SEC(2007) 1481

COMMISSION STAFF WORKING DOCUMENT
Accompanying document to the

Proposal for a
COUNCIL REGULATION
amending Regulation (EC) No 1782/2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers, as regards the support scheme for cotton

Cotton Impact Assessment

{COM(2007) 701 final}
{SEC(2007) 1482}

TABLE OF CONTENTS

LIST OF ACRONYMS

AWU	Annual Work Unit
CAP	Common Agricultural Policy
CMO	common market organisation
DG AGRI	Directorate-General for Agriculture and Rural Development
EAGF	European Agricultural Guarantee Fund
EAFRD	European Agricultural Fund for Rural Development
EU	European Union
FADN	Farm Accountancy Data Network
FNVA	Farm Net Value Added
ISG	Inter-Service Steering Group
MS	Member States
NGQ	National Guaranteed Quantity
RD	Rural Development
SFP	Single Farm Payment
SPS	Single Payment Scheme
UAA	Utilised Agricultural Area
WTO	World Trade Organisation

1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

Work on the impact assessment for the reform of the cotton regime was carried out by a European Commission Inter-Service Steering Group (ISG) set up by DG AGRI in October 2006. The first meeting of the ISG took place on 20 December 2006.

Thirteen Directorates-General (DGs) of the European Commission were invited to participate in the work of the Group[1], and the following DGs were actively involved in the exercise: the Secretariat-General (SG), Environment (ENV), Development (DEV), Budget (BUDG), Employment, Social Affairs and Equal Opportunities (EMPL), Economic and Financial Affairs (ECFIN), Trade (TRADE) and the European Anti-Fraud Office (OLAF).

The work on the impact assessment was carried out between October 2006 and October 2007, during which the ISG held a number of meetings[2]. First, the current situation of the cotton sector was analysed in depth and the main problems arising from the cotton regime were assessed. The group then identified the objectives of the cotton regime and alternative policy options to achieve those objectives. Finally, the economic, environmental and social impacts of the policy options were carefully evaluated.

In conducting this Impact Assessment account has been taken of ideas and opinions put forward by stakeholders in the course of the consultations outlined below[3].

In addition to regular monthly meetings with MS representatives in the framework of the Management Committee for Natural Fibres, as well as meetings with the Cotton Advisory Group on 2 June 2006, 27 October 2006, 27 April 2007 and 3 July 2007, the Commission services organised a series of consultations.

Workshops on specific issues were organised in cooperation with Commission DGs:

- on 25 May 2007, DG DEV organised a meeting with development NGOs, to present possible scenarios for the future reform. Questions raised by NGOs included the implications of the reform for the WTO negotiations and the consequences of different policy measures for farmers and ginners;
- on 21 June 2007, DG EMPL organised a meeting on cotton, during which workers' representatives highlighted the main concerns of employees in the sector;
- on 10 July 2007, DG AGRI organised a stakeholder meeting on environmental issues related to cotton production, discussing questions such as water availability, fertiliser and pesticide use, rotation systems and agri-environmental support.

For the purpose of the Impact Assessment two independent studies were commissioned from external consultants. On 2 February 2007 a contract was signed with *LMC International Ltd* (LMC) to prepare a report on the socio-economic situation of the cotton sector; the final report was submitted on 2 July 2007. The contract for the second study, concerning the environmental aspects of cotton production, was signed with *Alliance Environnement* (regrouping the *Institute for European Environmental Policy* and *Oréade Brèche*) on 20 February 2007; the final report was submitted on 27 July 2007.

---

1 See Annex 1.
2 Idem.
3 Full details of the stakeholder consultations are given in Annex 2.

On 17 April 2007, a delegation from the Junta de Andalucía presented their position on the future reform of cotton market to members of the ISG. On 8 June 2007, Professor Stelios Rozakis from the University of Athens presented the results of a quantitative analysis of Greek cotton production.

On 8 May 2007, in order to gather contributions from a broad range of individuals and organisations with an interest in the EU cotton policy, DG AGRI launched an Internet consultation. This included various types of questions, aimed at a general public as well as at a more specialised, expert community. The results of this consultation[4] have been treated as a supplementary source of information.

A number of submissions on the cotton reform were received directly from stakeholders. These included, in particular, Spanish associations of ginners, farmers and cooperatives[5] and the Greek Panhellenic Union of Cotton Ginners and Exporters.

On 7 September 2007 the Impact Assessment Board issued its opinion (see Annex 12) on the draft text of this document. In order to take account of their remarks a number of modifications were introduced.

2. PROBLEM DEFINITION

When Greece acceded to the EC, they requested that support should be given for cotton, as this was had an important role in the agricultural economy of some regions. As cotton was not considered an agricultural product (and therefore not listed in Annex I of the EC Treaty), a specific support regime for cotton was written into the Greek Treaty of Accession as Protocol No 4. This was later extended to Spain and Portugal when they joined the EC.

As the support scheme for cotton was so favourable, it led to a large increase in cotton areas, even in regions where cotton had previously not been grown. Since 1980, while the CAP gradually evolved towards a market-orientated approach, based on income support, the cotton support regime remained largely unchanged.

For this reason, in 2004 the Commission decided to review the regime and align it with the principles of the new CAP, while respecting the Protocol. As a result, aid was partly (65%) decoupled. A coupled part (35%) was maintained to respect the provisions of the Accession Protocol. However, the 2004 cotton reform, with the ratio 35% – 65%, was contested by Spain and the Court of Justice annulled it.

The central issue addressed by this Impact Assessment is the need to find an appropriate balance between respect for the Protocols[6] agreed when the cotton-producing Member States acceded to the EC and the progressive move to decoupled support initiated by the reform of the common agricultural policy in 2003. In doing so, the Impact Assessment will answer the points raised by the Court of Justice in its ruling.

---

4 See Annex 2 and the full results, provided in a specific report.

5 A joint position paper from ADESUR AEDA, COAG and CCAE, transmitted to the Commission on 22 June 2007 and a separate submission from ASAJA dated 27 July 2007.

6 Protocol 4 on cotton annexed to the Act of Accession of Greece, OJ L 291 of 19.11.1979 p. 174; extended to Spain and Portugal by Protocol No 14 annexed to the Act of Accession (OJ L 302, 15.11.1985, p. 436). For Bulgaria, although support for cotton is included in the SAPS regime currently applied, Article 110a of Regulation (EC) No 1782/2003 provides for a base area and amount for the crop-specific payment for Bulgaria.

The EU Cotton Sector

Cotton Production

Until 2006, cotton was produced in four Member States - Greece, Spain, Portugal and Bulgaria.

The EU-15 cotton area grew steadily until the end of the 1990s, peaking at almost 540 000 hectares in 1999/2000. Since then it has stabilised at 450 000 hectares.

Greece is the largest producer in the Community (381 586 ha in 2006) with 79 700 cotton farmers, mainly in three regions (Makedonia, Thessalia and Sterea Ellada). Cotton accounts for 9.1% of final Greek agricultural output. Most farmers grow between 2 and 5 hectares of cotton.

Cotton is grown on good arable land. Over 99% of Greek cotton uses irrigation.

In **Spain** cotton is grown mainly in Andalucia by about 9 500 farmers. Within Andalucia cotton accounts for 4.9% of final agricultural output. In 2006 aid was claimed for 62 839 ha.

Most Spanish farmers grow less than 10 hectares of cotton, but 5% cultivate over 50 hectares. Over 95% is grown with the help of irrigation.

The main competing crops are cereals, particularly wheat and maize; also sunflowers.

In both countries, cotton mainly uses family labour and requires slightly more labour per hectare than the alternative crops.

Cotton Ginning

Given the relatively high cost of transport, the ginning industry is only interested in locally grown unginned cotton. In both Greece and Spain, ginners are specialised and derive most of their income from ginning. In Greece, some ginners also crush cottonseed to produce oil and meal.

73 ginning mills were active in Greece in 2005/06; this suggests that total employment in the sector is around 3 000 workers (730 full time and 2 200 part time).

27 ginning mills were active in Spain in 2005/06. Total employment in the Spanish ginning industry is estimated at 1 350 jobs – 290 permanent and 1 060 seasonal employees.

2.1. The cotton regime[7] and its reform

The first common cotton regime was set up with the accession of Greece to the EC in 1980, then extended to Spain and Portugal in 1986 and, most recently, to Bulgaria. Protocols annexed to the Accession Treaties state, *inter alia*, that the Community shall ensure the support of cotton production in the regions where it is important for the agricultural economy, by the "*grant of an aid to production*".

[7] A presentation of the main features of the EU's economic policy for cotton is provided in Annex 4.

Originally, the regime was based on a "deficiency payment", comprising an aid per tonne of unginned cotton, granted to processors who paid a minimum price to the farmers that supplied them. The aid and minimum price were fixed periodically on the basis of the difference between an internal target price, “the guide price”, and the world market price.

Since accession, Greece has experienced a 165% increase in its cotton area, while cotton production more than tripled. Spain has seen a relatively smaller increase, with a 45% growth in cotton area and a 62% increase in cotton production. So it is clear that the regime did more than ensure the continuation of cotton production; it prompted a substantial expansion of the cotton area, cotton production and the processing activity.

The regime was complex to manage and control. More importantly, it was out-of-line with the ongoing process of CAP reform, whose main guiding principle is to move away from price and production support to income support.

In April 2004, in order to bring it in line with other sectors, the Council adopted a new regime for cotton, based on a decoupled income aid and a crop specific (area) payment. The total aid of € 803 million for cotton growers was split into four elements:

- 65% for the decoupled payment (approximately €562 million)
- 35% for the crop specific area payment (approximately €275 million)
- €22 million for the rural development of the regions concerned
- €4 million for the creation of Inter-branch Organisations.

Payments are no longer made via the ginning industry but directly to the farmer. The coupled payment is subject to a base area and payable on the opening of the boll, rather than linked to a selling obligation.

Member States can also decide to deduct up to 10% of the decoupled payment and redistribute it as an additional crop-specific payment for cotton that meets a minimum quality standard[8].

2.2. The annulment of the 2004 reform

On 7 September 2006, the European Court of Justice annulled the 2004 cotton reform[9], following a legal challenge made by the Spanish Government.

In its ruling, the Court did not question the nature of the reform, but it did query the way it was prepared and adopted. As the Court considered that the Council had failed to take into account all the relevant factors and circumstances when deciding the reform, the Court annulled it. In particular, it ruled that the Council had not given sufficient consideration either to the labour costs linked to cotton growing or to the viability of the ginning industry following the reform. The Court ruled that the new regime should continue to apply until a new regulation was adopted, "within a reasonable time".

---

[8] Article 69 of Regulation (EC) No 1782/2003.

[9] Established by Chapter 10a of Title IV of Council Regulation (EC) No 1782/2003, amended by Article 1(20) of Council Regulation (EC) No 864/2004.

The ruling of the European Court of Justice was based on the infringement of the proportionality principle, in that:

- the EC failed to carry out an impact study;
- the EC failed to consider family labour costs in the evaluation and decision process[10];
- The EC failed to take into consideration the impact of the new regime on the ginning industry, which, although not included in the Protocol, is directly linked to the business of cotton production.

Consequently, particular attention was paid to the latter two questions in the course of the impact analysis.

2.3. Considerations for the new regime

The objective of the Impact Assessment is to allow a coherent decision to be made for the future of the cotton regime. This must strike a fair balance between the Community's obligations under the Accession Protocols – to support cotton production in the regions where it is important for the agricultural economy, by granting production aid – and the need to integrate cotton into the CAP reform process, which is oriented towards decoupled payments that support farm incomes rather than any particular production.

Any change in the cotton regime will have an impact on cotton farmers, ginners and labourers (including seasonal labour).

As cotton production is concentrated in a few regions of the EU, the social and economic impact of the reform are limited to those areas.

Given that EU cotton production is very small, its global impact is very limited.

[10] The Spanish government's contention was that, in calculating the viability of cotton production, on the revenue side only the coupled portion of the aid should be considered and, in the calculation of production costs, direct labour costs should be included.

Table 1: The cotton economy of the European Union

	Year	Volume/Value	Trend ↓ → ↑
Cotton production as % of the value of EU agriculture output	2006	0.15%	
EU cotton production of which	2006	1.20 mio tonnes unginned cotton	↓
Greece		1.05 mio tonnes unginned cotton	↓
Spain		0.15 mio tonnes unginned cotton	↓
as % of world production		2%	
Apparent consumption	2006	0.52 mio tonnes	↓
Trade	2006*		
imported into EU		0.42 mio tonnes of ginned cotton	→
exported by EU		0.29 mio tonnes of ginned cotton	↓
World average price (CIF North Europe)	2006	1050 €/tonne of ginned cotton	
Area:	2006	445 000 ha	
Greece	2006	382 000 ha	↑
Spain	2006	63 000 ha	↓
Portugal	2005	400 ha	↓
Bulgaria	2006	2 000 ha	↓
as % of total UAA of EU		0.00%	↓
as % of world cotton area		1.3%	
Number of holdings			
Greece	2005	79 700 farms	
Spain	2005	9 500 farms	
Average yield		3.14 tonne/ha unginned cotton	→
Greece	2001–2006	3.01 tonne/ha unginned cotton	→
Spain	2001–2006	3.66 tonne/ha unginned cotton	→
Average cotton area per farm			
Greece	2005/2006	4.5 ha	
Spain	2005/2006	11 ha	
Number of ginners			
Greece	2005/2006	73	↓
Spain	2005/2006	27	↓
Turnover of ginning sector	2006	Greece – € 412 million	↓
		Spain – € 62 million	↓
EAGGF budget for cotton	2000–2002	€ 803 million	→

N.B. the conversion ratio of unginned to ginned cotton is 0.3.
Source: DG AGRI.

3. GENERAL OBJECTIVES OF THE COTTON REGIME

3.1. Origins of the cotton regime

As cotton was not produced by the founding Member States, it was not included in Annex 1 to the Treaty of Rome and so did not form part of the original CAP.

A support regime for cotton production was introduced when Greece acceded to the EC in 1980. It was extended to Spain and Portugal when they joined the EC in 1986 and, recently, to Bulgaria.

Recognising the great importance that cotton production represents for the economies concerned, the Protocol annexed to the respective Acts of Accession includes the following provisions:

1. *This Protocol concerns cotton […]*
2. *A system shall be introduced in the Community particularly to:*
   - *support the production of cotton in regions of the Community where it is important for the agricultural economy,*
   - *permit the producers concerned to earn a fair income,*
3. *The system referred to in paragraph 2 shall include the grant of an aid to production.*

In the context of the "Agenda 2000" reform of the CAP in March 1999, the Council of the European Union decided, *inter alia*, to maintain the cotton support system, but gave the Council the possibility to make adjustments to it. Council Regulation (EC) No 1050/2001 states, in Article 1(1):

"*The Council, acting by a qualified majority on a proposal from the Commission and after consulting the European Parliament, shall decide on the adjustments necessary to the system introduced pursuant to this Protocol and shall adopt the general rules necessary for implementing the provisions of this Protocol.*"

The Council emphasised that the system should include the granting of an aid to production.

3.2. CAP reform

In recent years the CAP has undergone a fundamental reform that reflects the general and specific objectives of Community policy, including the Lisbon Strategy and the Sustainable Development Strategy.

Agenda 2000 aimed at increasing competitiveness, food safety and quality, stabilising farm incomes, integrating environmental concerns into agricultural policy, developing the vitality of rural areas, simplification and strengthening decentralisation.

Subsequently, the 2003 CAP reform aimed to contribute to sustainable development by increasing the CAP's emphasis on healthy, high quality products, environmentally sustainable production methods, including organic production, renewable raw materials and the protection of biodiversity.

This was the context for the reform of the cotton regime, which was adopted by the Council in April 2004 and came into force in January 2006.

3.3. The objectives of the reformed cotton regime

In accordance with the EU's overall agricultural policy approach, the reform should encourage a competitive, sustainable and market–driven cotton sector, while safeguarding the Protocol commitments. With this perspective, the different reform options have been assessed on the basis of the following criteria:

- The continuation of agricultural activity as a component of the sustainable development of the cotton–producing regions
- The compatibility of the support options for cotton producers with the principles of the reformed CAP
- The compatibility of the support options for cotton producers with the EU's WTO commitments and the limitation of any negative impact on developing countries
- The stability and control of the EU budget
- The competitiveness and market orientation of the cotton sector
- The reduction of the impact of cotton production on the environment
- Simplification of the management of the support regime for cotton producers

4. POLICY OPTIONS

Taking into account the ruling of the Court of Justice, the aims of the CAP reform and the specific objectives of the cotton regime, and following extensive consultation with interested stakeholders, three options will be assessed:

- **Production Aid Option (Pre–Reform scenario)**
- **Mainly Decoupled Option (2004 Reform scenario)**
- **Full Decoupling Option.**

These three options can be seen as representing three distinct policy choices. Any alternatives or variations will fall into one of these "families" of option.

4.1. Production Aid Option (Pre–Reform scenario)

This option returns to the regime in place before the 2004 reform. It provides for a "deficiency" payment to be made to the processor (ginner) on condition that a minimum price is paid to cotton growers for the unginned cotton. The deficiency payment represents the difference between an institutional price (the "guide price", previously set by the Council) and the world market price, in order to protect farmers from world price fluctuations. This allowed ginners to market cotton at world market prices.

The aid was subject to a ceiling at Member State level, the National Guaranteed Quantity (NGQ) which, if it was overshot, triggered a proportionate reduction in the deficiency payment.

Variants on this option would be technically feasible, including the proposal by the Spanish cotton industry. This argues for a 20% decoupling of the payment, "with the remaining 80% linked to the final production of cotton […] with the obligation to sow, harvest and deliver to the ginning industry". These central features would be supplemented by a quality premium, recognition of the role of the inter-professional organisations and a restructuring scheme for the ginning industry, as part of the cotton regime (i.e. not under rural development).

While the pre-reform regime was not subject to cross-compliance, cotton production aids were linked to the observation of certain agronomic and environmental conditions.

Moreover, as most but not all cotton producers are beneficiaries of the Single Farm Payment (SFP) due to their other farming activities, most but not all cotton producers are subject to cross-compliance, since SFP beneficiaries are subject to such requirements on the whole farm.

4.2. Mainly Decoupled Option (2004 Reform scenario)

This option continues the regime put in place by the Council in April 2004, as part of the CAP reform. It has been in force since 1 January 2006.

The previous "deficiency" payment is replaced by:

- a decoupled payment,
- a crop specific area payment limited to a MS base area,
- a supplementary aid, depending on the region.

Of the national envelopes for cotton, 65% is paid to cotton farmers as a decoupled aid.

To meet the objective of supporting the production of cotton in the regions concerned, as provided for in the Accession Protocols, 35% of the national envelope is paid to cotton farmers as a cotton-specific area payment. This specific area aid for cotton is limited to maximum areas defined at national level.

Both the coupled and decoupled payments are subject to cross-compliance. In addition, for environmental and quality reasons, the land on which cotton can be grown and the varieties that can be sown must be authorised by the Member States.

The remainder of the Community budget for the cotton sector is allocated to financing rural development measures in the regions affected by the reform. These measures may include restructuring of the industry and marketing.

Under this regime, Member States also have the possibility[11] of using part of the decoupled aid to put in place measures that target specific goals.

In 2006 only Spain has used this possibility, paying a supplementary aid for quality characteristics, such as maximum impurity of 5%, humidity below 12% and yield higher than a locally fixed threshold.

While not specifically part of the cotton regime, in 2006 cotton producers in Spain and one Greek cotton-producing region had access to agri-environmental programmes. These permit

[11] Article 69 of Regulation (EC) No 1782/2003.

farmers to benefit from additional payments, on condition that they significantly reduce their chemical inputs (particularly the use of plastics and nitrates) and apply frequent rotation with non-irrigated crops.

For this option, the question of the advisable level of coupling was in particular addressed.

While the decoupling rate agreed by the Council in 2004 has been taken as the starting point, consideration was given to the impact of different levels of coupling, in particular whether a higher or lower level should be retained

A further issue that is addressed is the question of boll opening. Under the 2004 reform, the crop-specific payment is subject to the cotton being kept until the stage of boll opening. The impact assessment looks at the possible alternative of introducing an obligation to harvest, together with a minimum quality standard.

4.3. Full Decoupling Option

This option contemplates the full decoupling of all payments to cotton producers, including the current crop-specific area payment. If they choose to continue growing cotton, farmers are no longer subject to area or variety restrictions. They can also choose to grow other crops without financial penalty.

The cross-compliance and other horizontal requirements applying to other decoupled payments would apply.

Under this option a more or less substantial part of the previously coupled aid could be earmarked for rural development measures in the regions affected by the reform. These could include restructuring of the industry, diversification and innovation measures.

ASAJA, which represents young farmers in the region, would support this option[12], although their submission is not precise on the share of funding they would want allocated to rural development measures.

5. ANALYSIS OF IMPACTS

5.1. Economic impact

5.1.1. Methodological considerations

The farmer's decision to abandon cotton will not be based simply on the profitability (or not) of growing cotton, but on the greater (or lower) profitability of growing cotton compared with that of the alternative crops.

To ascertain the relative profitability of cotton and the most likely alternatives, the Gross Margin over Variable Costs was used, defined as Output (revenue, coupled aid included) minus Intermediate Consumption & Wages[13].

---

12 Submission from ASAJA to the Commission dated 27 July 2007.

13 For details see schema in Annex 6 and footnote 10 in section 2.2.

An analysis was made for each of the 3 options, comparing the Gross Margin of cotton grown using different production methods (traditional method, low input-low yield, under agri-environmental schemes) followed by a comparison with the Gross Margin of the alternative crops.

In order to calculate the Gross Margin FADN data was used.

The FADN model allows the allocation of working time and production costs between cotton and other crops. While the results obtained provide a reliable indication, it should be borne in mind that the economic behaviour of a farmer is equally determined by other factors such as age, the size of the farm, its structure, access to capital, equipment and availability of water, etc.

For this reason, the quantitative analysis was completed by a qualitative assessment carried out in the context of the external LMC study, based on questionnaires.

As the level of coupled aid influences the Gross Margin, in the specific case of Option 2 a sensitivity analysis was carried out showing the effect on cotton area and production of different levels of coupled aid (e.g. 30%, 25%, etc). This gives an indication of the the optimal coupling rate.

As Gross Margin over Variable Costs does not take into consideration the remuneration of family labour, this first step is complemented by an analysis of the total income of the agricultural holding. The cost of the family (unpaid) labour is estimated by using Family Farm Income[14], which represents the remuneration of the family (unpaid) labour. It was analysed for each option.

The farmer's decision is a complex process that takes into account the totality of the farm's production system. The Gross Margin analysis alone cannot reflect this composite reality. Family Farm Income, as an indicator of the overall farm income, better captures the whole economic logic of the farm and gives an explicit answer to the issue raised by the Court of Justice in its ruling.

The analysis made shows that the higher the Gross Margin, the higher the Family Farm Income. In addition, this economic relationship was verified statistically.

As concerns cotton, the key factors considered by farmers are similar in Spain and Greece: the coupled payment, agri-environmental and supplementary payments when available, and the price paid for cotton. The availability or not of agri-environmental payments has a significant role in influencing the farmer's planting decision. Although not part of the cotton regime, agri-environmental payments have therefore been taken into account in this analysis.

The crops considered as possible alternatives to cotton are wheat (soft and durum), maize and, in Spain, sunflowers.

Although present in cotton-growing regions, fruit and vegetables and sugar beet are not viewed as major viable alternatives. A switch to fruit and vegetables would require considerable new expertise and long-term investment. The two most likely competitors are citrus fruit and tomatoes for industry. Low prices for citrus and the quota regime for sugar beet would seem to preclude major investments in these sectors.

---

[14] For more details see schema in Annex 6.

Compared with cotton, maize would require more water and a change in irrigation system[15]. While it may represent an alternative, it would have to be combined with other crops such as non-irrigated cereals.

This economic analysis at farm level is completed by an analysis of the profitability of the ginning industry under each option.

In this way, we have taken into account the ruling of the Court of Justice as concerns the family labour costs in the farmer's decision-making process, and the impact of the options on the ginning industry.

5.1.2. Economic assessment of the Production Aid Option (Option 1)

5.1.2.1. Farm level

Under this option, the gross margin generated by cotton production is extremely high, as most – if not all – of the support is coupled to production.

Cotton would be far more profitable than growing any alternative crop: the gross margin and income from cotton would be considerably higher than for maize, durum wheat, or sunflower in Spain (Table 2).

Spanish farmers benefit from a partial coupling in the cereals sector and, for durum wheat, a supplementary premium (71.3 €/ha) on top of the quality premium (40€/ha).

In Greece, all direct payments in the grain sector have been fully decoupled. The only additional premium is the quality premium for durum wheat (40 €/ha).

Therefore, while this high incentive to produce cotton responds well to the objective of ensuring the continuation of cotton production, a coupled payment regime for cotton would represent an anomaly, as aid for the competing crops is now mostly decoupled.

In this context, coupled support would have major implications for cotton farmers and seriously hamper mobility in the sector. It would act as a disincentive to move out of the sector: any switch from cotton to grain would result in an income loss of over € 1 500 per ha in Spain (Table 2) and from € 700–1 000 per ha in Greece (Tables 3 and 4).

[15] In Greece sprinkler irrigation is used more frequently than in Spain by cotton growers. However, in Greece the use of irrigation over the past five years was more seriously affected by water availability.

Table 2: Spain – Gross margin under a Deficiency Payment System[16] (€ per ha)

	Cotton	Durum Wheat	Maize	Sunflower
Revenue				
Price per tonne (€/t)	908	159	114	233
Yield (t/ha, unginned)	4.1	3.4	12.3	2.0
Coupled Payment (€/ha)		59.9	115.0	59.9
Durum Wheat zone supplement (€/ha)		71.3		
Quality premium (€/ha)		40.0		
Total Revenue	3,751	711	1,512	514
Variable Costs (excluding Family Labour)	1,733	346	1,185	317
Gross Margin	2,018	365	327	197
Unpaid Labour (hrs)	182	134	103	60
Return to unpaid labour (€/hour)	11.1	2.7	3.2	3.3

Table 3: Makedonia – Gross margin under a Deficiency Payment System (€ per ha)

	Cotton	Durum Wheat	Maize
Revenue			
Price per tonne (€/t)	839	149	147
Yield (t/ha, unginned)	3.1	2.5	11.8
Coupled Payment (€/ha)		0.0	0.0
Durum Wheat zone supplement (€/ha)		0.0	
Quality premium (€/ha)		40.0	
Total Revenue	2,639	413	1,739
Variable Costs (excluding Family Labour)	1,169	381	1,013
Gross Margin	1,470	31	726
Unpaid Labour (hrs)	195	79	194
Return to unpaid labour (€/hour)	7.6	0.4	3.7

Table 4: Thessalia – Gross margin under a Deficiency Payment System (€ per ha)

	Cotton	Durum Wheat	Maize
Revenue			
Price per tonne (€/t)	867	149	147
Yield (t/ha, unginned)	3.6	3.9	11.6
Coupled Payment (€/ha)		0.0	0.0
Durum Wheat zone supplement (€/ha)		0.0	
Quality premium (€/ha)		40.0	
Total Revenue	3,164	621	1,703
Variable Costs (excluding Family Labour)	1,177	429	1,049
Gross Margin	1,987	191	653
Unpaid Labour (hrs)	220	98	194
Return to unpaid labour (€/hour)	9.0	2.0	3.4

NB: Return to unpaid labour covers the remuneration of family (unpaid) labour, also depreciation, rent and the cost of capital

[16] Tables 2, 3 and 4 are based on FADN data and LMC calculations.

As a result of this disproportionately high incentive to produce cotton, the National Guaranteed Quantities (NGQ) would be likely to overshoot and the aid per tonne would be reduced, significantly reducing the gross margin of cotton producers. In the longer term, this would, notably, harm the most vulnerable farmers.

Under this option, the main source of income instability would derive from yield variations, in particular linked to weather conditions.

5.1.2.2. Ginning industry

On the basis of the US average length of season[17] capacity utilisation is estimated at about 70% in Greece and 41% in Spain. These levels show that, even before the implementation of the 2004 reform, the industry was operating with considerable over-capacity. This was built up in the earlier context of higher world prices, good market prospects (in particular due to expanding demand from the Turkish textile industry).

Under this option it could be expected that cotton supply and capacity utilisation would not be significantly lower than 2000–2005 average levels. Any increase in production prompted by this option would only improve capacity utilisation and reduce costs per unit of processed cotton.

In addition, if this option includes the aid (€53/t) paid to ginners for administrative expenses, as under the pre-2004 regime, ginners would be guaranteed an additional source of revenue.

Overall, this option would discourage any reduction in processing capacity and restructuring of the ginning industry.

On the basis of the average ginning capacity of each Member State and the 2005/2006 unginned cotton production, the optimal number of mills would be 50 in Greece (against 73 at present) and 11 in Spain (against 27 at present).

5.1.3. Economic assessment of the Mainly Decoupled Option (Option 2)

5.1.3.1. Farm level

This option, which corresponds to the regime in place since 2006, led in 2006 to a drop in gross margins for cotton producers. The effect was different in Spain and Greece. In Spain, the cotton area fell back to pre-accession levels, while yields dropped by about one third. In Greece, which has much lower production costs than Spain, the area planted to cotton increased slightly and yields fell by only 20%. In Spain the reductions seem mainly due to the effect of regime change, while in Greece the adverse weather conditions seem to have been the predominant factor in the lower yield.

Under this option, cotton producers can choose whether to continue their traditional “high-input, high-yield” production system or to move to a “low-input, low-yield” approach. In addition, they may choose to participate in agri-environmental programmes where these are available, and so comply with stricter requirements on inputs and agronomic practices.

In Spain, as shown in Table 5, the “low-input, low-yield” production system generates a higher gross margin than the traditional "intensive" production method. This explains the

[17] US parameters: 81 day season based on two shifts (average operating day 17.5 hours).

general fall in yields seen in Spain in 2006. Farmers taking part in agri- environmental programmes benefited from ever higher gross margins. None of the major alternative crops achieve comparable results.

It is worth emphasising that these results are achieved while, in Spain only, sunflower and competing cereals still benefit from a certain percentage of coupled payment, which has to be included in the gross margin calculation. The possible removal of this residual coupled payment would further increase the relative competitiveness of cotton, by decreasing the gross margin of the alternative cereals.

For Greece, a separate micro-analysis was made for the two cotton-producing regions (see Tables 6 and 7) to reflect the policy variations in each.

Gross margin and return to unpaid labour from cotton are higher than those for durum wheat.

In contrast, cotton is apparently more profitable than maize only when agri-environmental schemes are available. Where agri-environmental payments are not made and there are no resource constraints, a shift to maize might be expected. However, a significant shift is not likely, at least in the short term; maize requires, in particular, different skills, higher water volumes and different irrigation equipment.

A distinction can be drawn between older farmers, who are unlikely to invest in the new know-how needed to grow maize, or make investments in planting and harvesting machinery, or switching from drip to sprinkler irrigation. Younger farmers with good farm structures and the possibility to invest are more likely to make the switch from cotton production to maize. As maize requires more water than cotton, a long-term switch to maize alone is unlikely; where water resources permit it, farmers would aim to maximize the area planted to maize and supplement this with durum wheat.

In Greece, agri-environmental measures have been implemented mainly in Thessalia; about half the local cotton producers participated. Despite lower yields and a 25% set aside obligation, cotton recorded higher gross margins than maize in this context. It can be concluded that, particularly where agri-environmental programmes are available, cotton remains the most profitable crop[18]. In Spain, even when no agri-environmental payments are made, cotton is more profitable than the alternatives. This position would be reinforced by the removal of residual coupled payments to the alternative cereal crops. In Greece, there is a greater potential for the cotton area to fall in the long term and be replaced by maize and, to a lesser extent, durum wheat. However, it is unlikely that the area planted to cotton would fall – in either country – far below the accession level.

The "Mainly Decoupled" option gives cotton producers the freedom to remain in the cotton sector or choose alternatives, while keeping their decoupled payment entitlements.

[18] The LMC survey confirms that, in the farmers' view, cotton remains the most profitable crop.

Table 5: Spain – returns following reform of cotton regime (€ per ha)

	Cotton (trad) Supplementary payment	Cotton (agri-env payments) Supplementary payment	Cotton (no agri-env payments) Supplementary payment	Cotton (low input-low yield)	Durum Wheat	Maize	Sunflower
Price per tonne (€/t)	244	244	244	244	139	129	233.0
Yield (t/ha, unginned)	4.1	2.6	2.6	1.0	3.4	12.3	2.2
Coupled Payment (€/ha)	1,039.0	1,039.0	1,039.0	1,039.0	59.9	115.0	59.9
Agri environmental (€/ha)		350.0					
Supplementary Payment (€/ha)	191.0	191.0	191.0				
Durum Wheat zone supplement (€/ha)	.				71.3		
Quality premium ((€/ha)					40.0		
Total Revenue	2,238	2,206	1,856	1,283	643	1,695	565
Variable Cost (excluding Family Labour)	1,733	1,328	1,328	833	346	1,185	317
Gross Margin	505	878	528	450	297	510	248
Unpaid Labour (hrs)	182	153	153	127	134	103	60
Return to unpaid labour (€/hour)	2.8	5.7	3.4	3.5	2.2	4.9	4.1

Source: LMC.
Notes: Cereal prices are based on average prices for the past three years. This is to reflect farmers' price expectations. Costs for "low-input low-yield" are based on the assumption that input costs fall by 75%, irrigation costs by 60%, and other costs by 50%; labour costs fall by 25% from the 2005 average.

Table 6: Thessalia – returns following reform of cotton regime (€ per ha)

	Cotton	**Cotton (agri-environ payments)**	**Durum Wheat**	**Maize**
Price per tonne (€/t)	309	309	147	143
Yield (t/ha, unginned)	3.4	2.5	3.9	11.6
Coupled Payment (€/ha)	528.6	528.6	0.0	0.0
Durum Wheat zone supplement (€/ha)			0.0	
Quality premium (€/ha)			40.0	
Agri-environmental payment		542.0		
Total Revenue	1,567	1,843	611	1,655
Variable Cost (excluding Family Labour)	1,177	1,127	429	1,049
Gross Margin	390	716	182	605
Unpaid Labour (hrs)	220	230	98	194
Return to unpaid labour (€/hour)	1.8	3.1	1.9	3.1

Source: LMC

Table 7: Makedonia – returns following reform of cotton regime (€ per ha)

	Cotton (normal yields)	Cotton (2006)	Durum Wheat	Maize
Price per tonne (€/t)	317	317	147	143
Yield (t/ha, unginned)	3.1	2.5	2.6	11.8
Coupled Payment (€/ha)	528.6	528.6	0.0	0.0
Durum Wheat zone supplement (€/ha)			0.0	
Quality premium (€/ha)			40.0	
Agro-environmental payment				
Total Revenue	1,511	1,320	418	1,690
Variable Cost (excluding Family Labour)	1,188	1,188	381	1,013
Gross Margin	323	132	37	677
Unpaid Labour (hrs)	195	195	79	194
Return to unpaid labour (€/hour)	1.7	0.7	0.5	3.5

Source: LMC
Notes: Cereal prices are based on average prices for the past three years. This is to reflect farmers' price expectations.

5.1.3.2. Ginning industry

As production support under the previous regime was channelled through the ginning industry, which had to pay a minimum price to cotton farmers, the turnover figures of ginners were artificially inflated by the amounts in fact transferred to the cotton growers. Under this option, as support is no longer paid through the ginning industry, a side effect is an automatic fall in the turnover of ginning plants.

The main impact that the ginning industry faces under this option is the reduced supply of locally grown raw material, due to the decrease in yields. As it is not economically viable to substitute local unginned cotton by imports, this option leads to a reduction in ginning capacity utilisation.

In addition, ginners no longer receive the aid previously given for administrative costs (53€/t).

In **Spain**, the fall in local supply resulted, in 2006, in a decline of average capacity utilisation from 41% to 17% (based on US length of season averages[19]). 6 out of 27 ginning plants did not open and one closed permanently.

The Spanish ginning industry is made up primarily of private enterprises that tend to be highly specialised, with 80% of their income deriving from cotton ginning. Consequently, the industry is particularly exposed to policy changes.

The fall in capacity utilisation has triggered a 24% increase in variable costs and a 68% increase in fixed costs per tonne of unginned cotton. The industry has responded by making cut-backs, especially in casual and skilled labour. Permanent staff has so far been largely unaffected.

[19] US parameters: 81 day season based on two shifts (average operating day 17.5 hours).

The average gross margin of the companies surveyed by LMC fell by about 27% in 2006 compared with 2005 and their profitability turned negative (Table 8). An optimal utilisation of the processing capacity would lead to a reduction of 75% (from the current 27 ginning plants to 7 or 8).

Table 8: Spanish Ginning Industry Profitability, 2004–2006
(€ per tonne, unginned cotton, unless otherwise stated)

	2004	2005	2006
Revenue			
Ginned cotton	819.84	863.10	925.37
Cotton seed price	147.32	149.08	168.51
Ratio cotton seed to ginned cotton	164%	160%	164%
Cotton seed revenue	240.93	239.00	276.64
Aid to cover administration (€ per tonne ginned cotton)	160.31	160.31	.
Revenue	1,221.08	1,262.41	1,202.01
Costs			
Unginned Cotton Purchase (€ per tonne, unginned cotton)	835.17	863.10	282.56
Aid (€ per tonne, unginned cotton)	607.00	621.00	.
Net Cost of Unginned Cotton Purchase to Ginner	228.17	242.10	282.56
Processing coefficient	33%	33%	33%
Net Cost of Unginned Cotton (€ per tonne ginned cotton)	691.41	733.64	856.25
Gross Margin	529.67	528.77	345.76
Transport (€ per tonne, ginned cotton)	56.06	56.06	.
Gross Margin (Excluding Transport Costs)	473.60	472.71	345.76
Production Costs (€ per tonne, ginned cotton)	300	312	451
Of which: Variable costs	148	164	203
Fixed costs	152	148	248
Profit	173.60	160.71	-105.24

Source: FADN and LMC calculations

In **Greece**, as the fall in cotton production was small in 2006, the effect on the ginning industry has so far been less pronounced.

The capacity utilisation of the companies surveyed by LMC fell from 70% in 2003–2005 to 56% in 2006.

The impact may have been attenuated by the fact that the ginning industry is mainly organised in multi-activity cooperatives, for which ginning represents only one third of their income. Almost 75% of the Greek cotton producers surveyed belong to these cooperatives.

The fall in capacity utilisation has triggered a 8% increase in variable costs and a 24% increase in fixed costs per tonne of unginned cotton.

Unlike in Spain, in 2006, the Greek industry's lower dependency on cotton, coupled with the modest drop in production, resulted in a reduction mainly in unskilled and casual labour.

The average gross margin of the companies surveyed by LMC was reduced by 50% in 2006 compared with 2005 and their profitability turned negative (Table 9). Optimal utilisation of the processing capacity would see the closure of over 20 of the present 73 ginning plants, with about 50 remaining operational.

Table 9: Greek Ginning Industry Profitability, 2004–2006
(€ per tonne, unginned cotton, unless otherwise stated

	2004	2005	2006
Revenue			
Ginned cotton	944.94	1,010.49	955.68
Cotton seed price	105.08	118.16	137.88
Ratio cotton seed to ginned cotton	148%	150%	146%
Cotton seed revenue	155.20	177.27	200.83
Aid to cover administration (€ per tonne ginned cotton)	160.31	160.31	.
Revenue	1,260.45	1,348.07	1,156.51
Costs			
Unginned Cotton Purchase (€ per tonne, unginned cotton)	260.98	298.93	313.73
Aid (€ per tonne, unginned cotton)	.	.	.
Net Cost of Unginned Cotton Purchase to Ginner	260.98	298.93	313.73
Processing coefficient	34%	34%	34%
Net Cost of Unginned Cotton (€ per tonne ginned cotton)	767.58	879.22	922.74
Gross Margin	492.87	468.85	233.78
Production Costs (€ per tonne, ginned cotton)	344	349	397
Of which: Variable costs	215	223	241
Fixed costs	129	126	156
Profit	148.87	119.85	-163.30

Note: The unginned purchase price quoted by ginners in the questionnaires did not include the aid

Source: FADN and LMC calculations

A comparison with the US ginning industry shows the EU industry has scope for improving its competitiveness[20]. While US processing costs are around € 65 per tonne of unginned cotton, in Greece they are around € 135 per tonne and € 150 per tonne in Spain.

The EU industry has a far bigger capacity than the US, but this capacity is inadequately used. The disproportionately high capacity leads to higher costs and lower profitability. In order to extend the processing period and so cut per unit processing costs, the EU industry built large warehouses to store raw cotton. In the US the raw cotton is baled and left at the edge of the field until it is processed.

The EU ginning industry has started to react to its declining profitability by making changes to the work process. However, under this option the reduction of local supply will require the industry to substantially reduce its over-capacity, to reduce costs and so improve its profitability. The process will be more marked in Spain, which has a greater over-capacity and where there are fewer cooperatives.

The impact on the industry in both countries, although likely to be substantial, necessitating major restructuring and consolidation, is not expected to put the whole ginning industry at risk. More concretely, the reform will entail a reduction of cotton production and, as a consequence, ginning capacity will have to be reduced. Part of the ginning industry will cease activity, while the remaining part will have to increase its capacity utilisation rate, in order to improve its profitability.

[20] See Annex 7.

5.1.3.3. Sensitivity analysis of Partial Coupling

In this section an analysis[21] is made of the impact on cotton production of different degrees of coupling, compared with the level decided by the Council in April 2004, namely 35%. The issue is explored on the basis of the responses given by cotton producers to the LMC survey carried out in the regions concerned.

This sensitivity analysis is based on the change in gross margin of cotton grown under different production systems, compared with alternative crops. This allows the construction of a production function that reflects the likely change in land use between cotton and competing crops, as well as expected levels of cotton production.

As shown in Table 10, with the current level of coupled payment (€ 529 per ha) the cotton area in Greece will decrease slightly (–4%) in the long term, compared with the pre-reform situation. With a 40% coupled payment (€ 605/ha) the cotton area and production would be quite similar compared with the pre-reform situation. In this case the optimal number of mills would be about 55 against 73 at present.

With a 30% coupled payment (€ 453/ha) both the cotton area and production would fall by about 18% compared with the pre-reform situation. The theoretically optimal number of ginning plants would be 43.

Reducing the coupled payment to 25% (€ 370 per ha) results in the cotton area and production falling by about 30%. In this case, the theoretically optimal number of ginning plants would be 36.

Table 10: Unginned Cotton Production as Coupled Payments Change – Greece

Coupled Payment	Coupled Payment	Total Area	Change in area	Total Production	Change in Production	Optimal number of mills (1)
€ per ha	**%**	**000 ha**	**%**	**000 tonnes**	**%**	**number**
794	53%	494	32%	1554	35%	71
741	49%	470	25%	1473	28%	67
688	46%	445	19%	1394	21%	63
635	42%	411	10%	1280	11%	58
605	40%	387	3%	1203	4%	55
582	39%	379	1%	1178	2%	53
529	**35%**	**362**	**-4%**	**1123**	**-2%**	**51**
476	31%	321	-14%	989	-14%	45
453	30%	308	-18%	949	-17%	43
423	28%	295	-21%	908	-21%	41
370	25%	262	-30%	798	-31%	36
317	21%	241	-36%	729	-37%	33
265	18%	220	-41%	660	-43%	30

* Compared with 2005, last year of the pre-reform regime
(1) on the basis of the average ginning capacity = 22 000 tonnes per mill
Source: LMC estimates.

[21] For the detailed results see the LMC study.

In Spain, as shown in Table 11, with the current level of coupled payment (€ 1 039 per ha) the long-term impact will be more marked. If the cotton area levels out at about 65 000 ha production will stabilise at around 165 000 tonnes, with the generalisation of low yields.

With a 40% coupled payment (€ 1187/ha) the change in area would be –17% and production would fall by almost 48% compared with the pre-reform situation. However, at about 185.000 tonnes, production would return to about the same level as at the time of Spain's accession to the Community in 1986. The theoretically optimal number of ginning plants would be 6, against the current 27.

With a 30% coupled payment (€890 per ha) the cotton area would fall by almost 37% and production by 61%, compared with the pre-reform situation. The theoretically optimal number of ginning plants would be 4.

Reducing the coupled payment to 25% (€727 per ha) results in the cotton area falling by 50% and production falling by 69%, compared with the pre-reform situation. In this case the optimal number of mills would be 3.

Table 11: Unginned Cotton Production as Coupled Payments Change – Spain

Coupled Payment	Coupled Payment	Total Area	Change in area	Total Production	Change in Production	Optimal number of mills (1)
€ per ha	**%**	**000 ha**	**%**	**000 tonnes**	**%**	**number**
1559	53%	84	-3%	218	-39%	7
1455	49%	82	-5%	213	-41%	7
1351	46%	79	-8%	206	-43%	6
1247	42%	75	-13%	195	-46%	6
1187	40%	71	-17%	185	-48%	6
1143	39%	70	-19%	182	-49%	6
1039	**35%**	**64**	**-26%**	**166**	**-54%**	**5**
935	32%	57	-33%	149	-59%	5
890	30%	54	-37%	140	-61%	4
831	28%	50	-41%	131	-64%	4
727	25%	43	-50%	111	-69%	3
623	21%	34	-61%	88	-76%	3
520	18%	24	-72%	63	-83%	2

* Compared with 2005, last year of the pre-reform regime

(1) on the basis of the average ginning capacity = 32 000 tonnes per mill.

Source: LMC estimates

The results of the 2004 reform (35% coupled aid) at least in the short term, are somewhat different in Greece and in Spain. In Spain the area under cotton went back close to its pre-accession level (–14%), while in Greece it remained stable, mainly due to the slow structural change in Greek agriculture. This suggests that it is not necessary to set the coupled payment at 40% in order to maintain a significant level of cotton production in Spain and Greece, while a further reduction of coupled payment to 30% or 25% could trigger a big reduction in cotton production.

If the coupled aid is changed from its current level, it will be necessary to recalculate the level of decoupled aid granted to each cotton farmer. In effect, increasing the coupled aid from 35% to 40% would entail reducing the amount of decoupled aid from 65% to 60%. The funds generated by the reduction of the decoupled aid would then have to be reattributed to the coupled aid, to ensure that the overall effect of the adjustment is budget neutral.

Any adjustment of the coupling rate would inevitably be complicated from an administrative point of view, especially if it were to be put in place already in 2008, only the third year of implementation of the reformed cotton regime. Difficulties could in particular arise where payment rights have transferred from one farmer to another since 2006, as the decoupled payment is calculated on the basis of historical production levels or the number of eligible hectares farmed during the first year of implementation of the scheme.

For each of these cases modalities would have to be analysed by the Commission and implemented by the Member State, entailing a case by case treatment of each file. If possible it would seem advisable that this extra administrative burden should be avoided, at least in the short term. It could therefore be concluded that 35% appears to be the optimal level for the coupled payment.

5.1.3.4. Quality and the obligation to harvest[22]

During the consultation process, various stakeholders raised the question whether the current regime is affecting the quality of cotton harvested. In this context two specific issues were raised: low yields and harvesting practices.

Currently used varieties of cotton, usually preferred for their higher yields, are highly input sensitive. For these varieties, high inputs result in good quality. The use of lowered inputs results, in particular, in shorter fibres i.e. lower quality cotton. Other lower yield varieties would offer a good quality standard with a low level of inputs.

Under the present system, the coupled payment is granted only to farmers who keep the cotton crop at least until the stage of "boll opening".

This condition may induce farmers to grow cotton only up to boll opening for the purpose of getting the coupled payment. Abandonment is likely if harvesting costs are higher than the expected revenue from the sale of the harvest. In this respect, the yield level is critical in the decision whether to harvest. Yields[23] would need to fall under 1.3 tonnes per hectare before harvesting becomes uneconomical

There is no clear evidence that the boll-opening condition affects the final quality of the harvested cotton. There are indications that harvesting practices that increase impurities in the fibres have been used more widely in 2006. However, it is inconclusive whether, and to what extent, the boll opening condition is influential in altering harvesting practices or lowering inputs.

The harvesting obligation should have little or no impact on the level of cotton production. It could simplify the control procedure, compared with the boll opening requirement. It would

---

22 See also Annex 9.

23 It should be noted that no abandonment of production in the field was recorded in 2006. Assuming the lowest world price (199 €/tonne) in the last 12 years and average net harvesting costs (255 €/hectare) yields should fall below 1.3 tonne per hectare to make harvesting uneconomical. See Annex 6.

also facilitate the definition and implementation of quality standards by inter-branch organisations.

Thus, the objective of higher quality might effectively be achieved by combining a minimum quality standard with a harvesting obligation.

5.1.4. Economic assessment of the Full Decoupling Option (Option 3)

5.1.4.1. Farm level

The full decoupling of the crop-specific area payment for all crops would reduce the relative profitability of cotton. Gross margins for cotton would fall well below those for other crops and become negative in all instances, except for cotton grown under agri-environmental programmes in Thessaly (see tables 12, 13, 14).

If there is no longer any specific incentive to produce cotton, under this option there is a strong risk that cotton areas would decline dramatically, at least in the short term[24]. In Spain it would be expected that the cotton area would fall to zero.

In Greece there would be a decline in the cotton area; only cotton grown extensively under agri-environmental programmes would be expected to continue (at present 93 000 hectares in Thessaly).

Table 12: Spain – returns under full decoupling (€ per ha)

	Cotton (trad)	Cotton (agri-env payments)	Cotton (no agri-env payments)	Cotton (low input-low yield)	Durum Wheat	Maize	Sunflower
	Supplementary payment	Supplementary payment	Supplementary payment				
Price per tonne (€/t)	244	244	244	244	139	129	233
Yield (t/ha, unginned)	4,1	2,6	2,6	1	3,4	12,3	2,2
Coupled Payment (€/ha)	0	0	0	0	59,9	115,0	59,9
Agri environmental (€/ha)		350					
Supplementary Payment (€/ha)	191	191	191				
Durum Wheat zone supplement (€/ha)					71,3		
Quality premium (€/ha)					40		
Total Revenue	1.199	1.167	817	244	643	1.695	565
Variable Cost (excluding Family Labour)	1.733	1.328	1.328	833	346	1.185	317
Gross Margin	-534	-161	-511	-589	297	510	248
Unpaid Labour (hrs)	182	153	153	127	134	103	60
Return to unpaid labour (€/hour)	-	-	-	-	2,2	4,9	4,1

[24] See Annex 6.

Table 13: Thessalia – returns under full decoupling (€ per ha)

	Cotton	Cotton (agri-environ payments)	Durum Wheat	Maize
Price per tonne (€/t)	309	309	147	143
Yield (t/ha, unginned)	3,4	2,5	3,9	11,6
Coupled Payment (€/ha)	0	0	0	0
Durum Wheat zone supplement (€/ha)			0	
Quality premium (€/ha)			40	
Agri-environmental payment		542		
Total Revenue	1.038	1.314	611	1.655
Variable Cost (excluding Family Labour)	1.177	1.127	429	1.049
Gross Margin	-139	187	182	606
Unpaid Labour (hrs)	220	230	98	194
Return to unpaid labour (€/hour)	-	0,8	1,9	3,1

Source: LMC

Table 14: Makedonia – returns under full decoupling (€ per ha)

	Cotton (normal yields)	Cotton (2006)	Durum Wheat	Maize
Price per tonne (€/t)	317	317	147	143
Yield (t/ha, unginned)	3,1	2,5	2,6	11,8
Coupled Payment (€/ha)	0	0	0	0
Durum Wheat zone supplement (€/ha)			0	
Quality premium (€/ha)			40	
Agro-environmental payment				
Total Revenue	982	791	418	1.690
Variable Cost (excluding Family Labour)	1.188	1.188	381	1.013
Gross Margin	-206	-397	37	677
Unpaid Labour (hrs)	195	195	79	194
Return to unpaid labour (€/hour)	-	-	0,5	3,5

Source: LMC

5.1.4.2. Ginning industry

As a consequence of the considerable loss of production, the ginning industry would no longer have access to sufficient raw cotton to remain operational. Most ginning plants would therefore be forced to close, or look for viable supply channels outside the EU.

While the full decoupling of cotton support is in line with the ongoing CAP reform process, it does not respond to the objective of supporting the production of cotton. As it also includes no specific aid for production, this option is unlikely to be in compliance with the Accession Protocols.

The provision for rural development measures made under this option would support the restructuring of the industry and its diversification into new activities.

5.1.5. Assessment of the impact of each option on Family Farm Income

Using micro-economic data from the FADN for the period 2002–2004, a calculation was made of the income generated by cotton in Greece and Spain on different types of holding: <5 ha of cotton, from 5–10 ha of cotton, >10 ha of cotton. This corresponds to the income of cotton farmers under Option 1 (Production Aid regime).

For Option 2, a simulation was made on the basis of the same FADN data for farms switching to *low-input, low-yield* production systems (cf section 5.1.3.1). The following assumptions were made as concerns cotton yield: 2.6 tonnes/ha for Spain and 3.1 tonnes/ha for Greece. However, the variable costs have not been adjusted downwards to reflect the lower-yield production system. Therefore the calculations may underestimate income.

For Option 3, total abandonment of cotton production was assumed, with a switch to maize and durum wheat.

The results for the three Options are shown in Table 15, for each size of farm and Member State. In addition, the table gives the results for Options 2 and 3 in percentage terms, compared with Option 1.

The higher Family Farm Income under the old regime (Option 1) is mainly because:

- in accordance with comments put forward by colleagues in DG ENV during the inter-service consultation, agri-environmental payments are not taken into account;
- under Option 2 farmers switching to the low-input, low-yield production system attained a lower return from the market;
- under Option 3 the coupled aid is no longer paid.

Table 15: Impact on Family Farm Income of the three Options

Member State	Region	Cotton area	Option 1	Option 2	Option 3	FFI	
			FFI	FFI	FFI	2/1	3/1
			€ per farm	€ per farm	€ per farm	%	%
Greece	Makedonia-Thraki	1-5	5.784	5.654	6.006	-2,3%	3,8%
		5-10	10.306	9.791	10.673	-5,0%	3,6%
		>=10	20.080	18.549	20.455	-7,6%	1,9%
		Total	**7.835**	**7.514**	**8.096**	**-4,1%**	**3,3%**
	Thessalia	1-5	5.970	5.270	5.434	-11,7%	-9,0%
		5-10	12.076	9.263	9.690	-23,3%	-19,8%
		>=10	20.246	13.016	13.967	-35,7%	-31,0%
		Total	**10.441**	**7.865**	**8.257**	**-24,7%**	**-20,9%**
	Total Average for Greece	1-5	5.843	5.532	5.825	-5,3%	-0,3%
		5-10	11.137	9.543	10.211	-14,3%	-8,3%
		>=10	20.179	15.251	16.588	-24,4%	-17,8%
		Total	**8.839**	**7.649**	**8.158**	**-13,5%**	**-7,7%**
Spain	Andalucia	1-5	18.109	17.152	17.241	-5,3%	-4,8%
		5-10	45.922	41.606	41.393	-9,4%	-9,9%
		>=20	125.061	115.814	114.843	-7,4%	-8,2%
	Total Average for Spain	**Total**	**46.914**	**43.427**	**43.225**	**-7,4%**	**-7,9%**

*Maize (80%) and durum wheat (20%)

In Greece, under Option 2, if no agri-environmental payments are available, Family Farm Income will fall by between 11.7% and 35.7% in Thessalia, while the drop will be minimal in Makedonia. Under Option 3 the fall in income is slightly lower in Thessalia and even positive for Makedonia.

In Spain, the fall in incomes is less pronounced, with an average drop of about 7.4% for Option 2 and 8% for Option 3.

In the simulation of the options results show that income changes are dramatic only for Thessalia, where agri-environmental payments play a crucial role. When these payments are excluded from the income calculation, the impact is particularly severe for large farms. On average, the income change is biggest in Greece for cotton farmers with more than 10 ha and in Spain for farmers with 5–10 ha of cotton.

As explained in the methodology (Section 5.1.1) a correlation analysis was carried out between the Gross Margin and the remuneration of the family labour (FFI). This analysis was based on the FADN sample of farms specialised in cotton production in Greece and Spain. The positive correlation was found to be high between the two economic indicators[25].

The results of the Gross Margin analysis are mirrored by the results of the Family Farm Income analysis. In other words, the higher the Gross Margin of a crop, the higher the income generated by the farm for the family.

While these analyses give a robust indication of the likely economic response of farmers, experience shows that their decision will not depend exclusively on the evolution of income, but will be quite sensitive to other factors such as water availability, their age and access to capital, and the simplification that might be represented by a switch to growing cereals, especially wheat. These elements are difficult to capture.

5.2. Environmental Impact[26]

5.2.1. Environmental impact of cotton production

Cotton can be grown using different techniques and at different levels of intensity. The intensive production of cotton is associated with the following negative impacts on environmental resources, in order of importance:

- *Impact on water quantity:* almost all of the EU's cotton area is irrigated. In Greece, some groundwater sources are significantly over-used. Cotton is grown in areas where water is a limited resource. The use of different technologies has an impact on water use. In Greece more sprinklers are used than in Spain, where drip irrigation is more widespread. Neither country applies water pricing, as provided for in the Water Framework.
- *Impact on water quality*: the high input of pesticides, herbicides, plant growth inhibitors and defoliants required[27] for growing cotton, made worse when associated with

[25] See Annex 6.

[26] This chapter is based on studies carried out by *Alliance Environnement* and the *Institute for European Environmental Policy*, supplemented by information from Prof. Vlahos (University of Athens) and C. Giourga (University of Aegean) at the recommendation of WWF. Details of the development of input use in the Greek and Spanish cotton sectors are provided in Annex 8.

monoculture, leads to the degradation of ground and surface water quality. In addition, the high use of fertilisers leads to eutrophication, as well as increasing contamination of aquatic ecosystems. In both Spain and Greece the cotton areas are concentrated in Nitrate Vulnerable Zones (Nitrates Directive). 1 ha of cotton uses about 5 000m^3 of water, 150–200 kg of N, 1.5–3 litres of commercial phytosanitary products and 1–2 litres of commercial pesticide products, depending on the number of treatments.

- *Impact on soil*: high input use, irrigation and monoculture represent high risks of soil contamination and deterioration of soil quality (compaction, reduction of soil organisms and organic matter, salination). In addition, post-harvest residues for cotton contain less organic matter compared with cereals.

- *Impact on biodiversity and habitats*: high input use, water consumption and monoculture have a negative impact on biodiversity, loss of habitats and biological stability of species. Cotton monoculture fosters crop parasites that require an increased use of agro-chemicals, which also have an impact on non-targeted organisms. Some pesticides[28] used on cotton are very toxic and cause damage to fauna and flora. Defoliants have a similar impact. The lack of field margins and hedges in cotton fields has a negative effect, mainly on the presence of bird species, but also on the landscape. Water use and the frequent over-consumption of groundwater result in additional pressures to riparian and lake ecosystems in the vicinity, mainly due to fluctuations in the requirements of water within the cotton cultivation cycle. Some indirect effects to biodiversity include an impact on neighbouring areas resulting from water transfer projects for irrigating cotton.

- *Impact on waste production*: problems arise from packaging used for inputs and plastic coverage for growth acceleration.

The importance of these risks varies according to farming practice, the degree of intensiveness and site-specific vulnerability.

5.2.2. Environmental impact of alternative crops

- *Winter cereals, sunflowers* and soya in general require fewer inputs and less irrigation. Rotation is more varied. Lower inputs means less packaging; plastic cover is not an issue.

- *Irrigated fodder crops* require fewer inputs (no nitrogen). Most crops are more soil-friendly. Rotation is systematically more varied. Fewer inputs mean less packaging and plastic coverage is not an issue.

- *Maize* requires slightly less pesticides but more fertilisers than cotton; like cotton, maize is grown as a monoculture and requires even more water. Its impact on the landscape represents no visual improvement. All the impacts on biodiversity and habitats associated with cotton apply equally to maize. Waste problems are lower and there is no use of plastic.

- *Vegetables* are grown with comparable or higher input levels than cotton. The need for irrigation is the same or higher. The use of plastic cover is more frequent, as is the level of packaging waste.

---

[27] Cotton represents 2.4% of the world's total agricultural area, accounts for 11% of the world pesticide demand and 24% of the world demand for insecticides. 33 out of 46 products used are toxic to extremely toxic.

[28] These include endosulfan, phorat, deltamethrine, trifluraline and fluometuron.

Table 16: Environmental impact of alternative crops to cotton

Relative environmental impact, where ☺☺☺, ☺☺, ☺ stand for less, (0) for neutral and ☹, ☹☹, ☹☹☹ for bigger impact

	Relative environmental impact on				
	water quality	**water quantity**	**soil**	**biodiversity and habitats**	**waste**
Non-irrigated crops: durum wheat, soft wheat, other dry cereals and sunflower	☺☺	☺☺☺	☺☺	☺☺	☺☺
Irrigated fodder (alfalfa, clover, vetch etc.)	☺☺ to ☺☺☺	☹☹ to ☺	☺☺ to ☺☺☺	☺☺ to ☺☺☺	☺☺
Maize	☹	0 to ☹☹	0 to ☺	0 to ☺	☺
Vegetables	0 to ☹☹	0 to ☹☹	0 to ☹☹	0 to ☹☹	0 to ☹
Cotton	Reference				

Source: Alliance Environnement

5.2.3. Environmental assessment of the Production Aid Option (Option 1)

Price support has the effect of encouraging intensive cultivation practices. In Greece, rotation is hardly practised, while in Spain it is compulsory only for farms growing more than 10 ha of cotton. Monoculture of cotton is, therefore, prevalent.

Under this option, therefore, the environmental impact would be particularly marked. The problems related to intensive cotton production, as described in section 5.2.1, would be most evident, with a strong negative impact on water quantity and quality, soil, biodiversity and waste production.

The biggest problem is water pollution, as cotton is grown mainly in areas designated as Nitrate Vulnerable Zone under the Nitrate Directive. In particular, the lowering of ground water levels has an impact on water quality too, as the remaining water resources are becoming more vulnerable to pollution from pesticides and fertilisers.

In the period 2000–2005 Spain achieved water economies by supporting the replacement of sprinklers by drip-irrigation systems, which combine fertilisation with irrigation and use water in a more rational way. In Greece, where sprinkler irrigation continued to be the main system, higher water use was recorded.

When the cotton production aid ("deficiency payment") regime was in place, prior to the reform, agri-environmental measures attracted a limited number of participants. The high prices paid for cotton made the respect of environmental constraints, especially fertiliser use, economically unattractive for farmers. In this context, the only viable agri-environmental programme for cotton would have been support for organic cotton production. Before 2000, neither country had put programmes in place for their Nitrate Vulnerable Zones, imposing restriction in fertiliser use.

However, under the SPS, all direct payments are subject to cross-compliance rules. Good Agricultural and Environmental Conditions (GAEC) ensure compliance with EU environmental standards, which would to some extent mitigate some of the environmental

damage possible under this option. In addition, agri-environmental programmes may now prove more attractive to cotton farmers in some regions.

5.2.4. Environmental assessment of the Mainly Decoupled Option (Option 2)

The environmental impact for this option is based mainly on observations from the first year of implementation of the reformed regime.

In Greece in the first year of implementation a slight tendency towards intensification was noted. A small expansion of cotton area was accompanied by an increased use of inputs. It is expected to take some time for Greek farmers to switch to alternative crops. While a change to wheat would have environmental benefits compared with cotton, a switch to maize would see no significant environmental gains, and water needs would be higher. Alternatives could be sunflower or soya.

In Spain, the cotton area and yields fell in 2006, resulting in a reduction in input use. 75% of farmers used fewer inputs and less water and the use of defoliants has dwindled. This option has improved the attractiveness of integrated production[29], which saw a big increase in participation rates in 2006; it now covers 79% of Spain's cotton area.

While it is difficult to quantify improvements after only one year of implementation, in Spain a trend towards extensification is visible; the use of water for irrigation fell by 250 million m^3 and plastic covering is no longer used.

Under this option, both coupled and decoupled payments are subject to cross-compliance. In addition, for environmental and quality reasons, the land on which cotton can be grown and the varieties that can be sown must be authorised by the Member States.

5.2.5. Environmental assessment of the Full Decoupling Option (Option 3)

Under this option, cotton production would no longer be economically viable in Spain, where it would probably cease completely.

In Greece, it could be limited to the 93 000 hectares of cotton grown under agri-environmental programmes, for which farmers receive an additional premium. However, continuing support from this Rural Development measure would have repercussions for Greece's agri-environmental programme, as the resources committed will not be available for resolving environmental problems in other regions and for contributing to better land management. Agri-environmental measures should not become a hidden support for cotton production. These payments will anyway have to be re-calculated and this may result in a change in the contribution now made to the income of cotton farmers.

It would therefore seem probable that, under this option, the EU's remaining cotton production would be extensive, which would have a lower environmental impact.

The main alternative crops replacing cotton would be wheat, maize and possibly sunflower and soya. While a change to wheat would have environmental benefits compared with cotton, a switch to maize would see no environmental gains and water needs would be even higher.

---

[29] For details of agri-environmental schemes for cotton in Spain and Greece, see Annex 8.

5.2.6. Environmental impact of the ginning industry

The ginning industry is a seasonal industry, which generates relatively few environmental problems except organic waste, some noise and dust. However, for technical and quality reasons the ginning industry favours the use of defoliants. Under the current regime (Option 2) their use has been widely reduced.

5.3. Social Impact

5.3.1. Employment in the cotton sector

In the producing regions, cotton plays a central role in the local economy.

In Greece (mainly Makedonia, Thessalia and Sterea) 79 700 farmers are engaged in cotton farming. In Andalusia, where 98% of Spain's cotton production is concentrated, there are 9 500 cotton farmers.

On farms[30] specialised in cotton production, most of the income is derived from farming activities.

Cotton production is relatively more labour-intensive than the main alternative crops, and in particular uses family labour. In Greece family labour accounts for 97.8% of the total regular labour force, while in Spain the equivalent figure is 78.6%.

Table 17: Hours of family labour (2004)

	Cotton	**Maize**	**Durum wheat**	**Sunflower**
GREECE				
Macedonia	195	194	79	–
Thessaly	220	446	98	–
SPAIN				
Andalusia	182	103	134	60

Source: FADN

In Greece (Macedonia) the cultivation of maize and cotton requires the same number of hours of family labour (195), while in Spain cotton requires more family labour (182 hours) than maize (103), durum wheat (134) and sunflower (60). This implies that a switch from cotton to alternative crops would free family labour hours in this Member State.

Labour is an important element in production costs. In **Greece,** assuming as opportunity cost the paid wage, family labour alone makes up about a quarter to one fifth of the total production costs per hectare. The importance of family labour compared with total costs should also be noted.

Similarly, in **Spain,** labour is an important element in cotton production costs. Family labour constitutes about one third of the total production costs per hectare.

[30] Some details of the structure of EU cotton-producing farms are given in Annex 5.

Table 18: Labour costs in 2004 (€/ha)

GREECE - Macedonia	**Cotton**	**Maize**	**Durum wheat**	**Sunflower**
Contracted labour/services	263	129	55	-
Labour paid	83	46	13	-
Total family labour	593	591	240	-
Total	939	766	308	-
Labour cost/Total cost	35%	37%	34%	
GREECE - Thessaly				
Contracted labour/services	247	167	70	-
Labour paid	30	35	25	-
Total family labour	682	1.381	303	-
Total	960	1.584	399	-
Labour cost/Total cost	39%	55%	42%	
SPAIN				
Contracted labour/services	465	215	33	59
Labour paid	77	118	13	50
Total family labour	990	560	729	325
Total	1.532	892	775	434
Labour cost/Total cost	50%	42%	67%	59%

Source: FADN

In 2005/06 the **cotton ginning industry**[31] employed about 3 200 people in Greece and 1 350 in Spain. Much of the employment is seasonal (from one third to a quarter)[32].

An overview of the social impact of the three different options, at farm and industry level, is given at the end of this section, in Table 19.

5.3.2. Social Assessment of the Production Aid Option (Option 1)

As it encourages more intensive production which requires a higher use of inputs, including labour, this option would be likely to boost seasonal employment in the ginning industry, at least in the short term.

In the long term, however, the continued erosion of competitiveness in the sector could trap workers in low value added, poorly paid employment, so endangering the social sustainability of the regions concerned.

As noted in Section 5.1.2.2, the deficiency payment system led to over-capacity in the ginning industry. Therefore, even under this option, a restructuring process with a down-sizing of the industry's workforce would be necessary in order to provide sustainable, long-term rural

[31] Information on the structure of the EU cotton ginning industry is provided in Annex 7.

[32] See details in Annex 7 – Tables A7.2, A7.6 and A7.8.

employment. A restructuring could lead to a loss of about 900 work units in Greece and 800 work units in Spain.

5.3.3. Social Assessment of the Mainly Decoupled Option (Option 2)

Data for 2006 indicate that the regime change has resulted in a reduction of inputs, including labour, in the cotton sector. This decrease was mainly in paid and/or contracted labour, while the number of hours worked by family members remained practically the same.

At farm level, however, it is not sure that there was a drop in the total labour employed, as labour no longer used for growing cotton may have been re-employed on alternative crops. Spain could be more sensitive to this fall in labour demand, as maize and wheat require one third fewer working hours than cotton.

As shown in 2006, job losses in the ginning industry could be relatively large, due to the reduced supply of unginned cotton, the acceleration of the restructuring process and reduction of over-capacity.

While losses would be at the same level as mentioned in Option 1 for Greece, 1 120 work units would be lost in Spain.

In the long term, the consolidation and restructuring of the industry and consequent gains in competitiveness could allow the industry to create jobs in higher value added activities. However, the overall employment balance in the cotton sector should be expected to be negative.

Rural development measures funded under this option will help to create rural employment in the regions affected and complementary sources of income for family farm members.

5.3.4. Social Assessment of the Full Decoupling Option (Option 3)

This option could have a relatively big impact on employment.

At farm level, it can be assumed that labour no longer required for cotton would be employed in growing alternative crops. As the use of unpaid labour is higher for cotton than for maize, wheat or sunflowers, some labour could be released for more profitable alternatives, particularly in Spain.

As Spain's cotton area would entirely disappear under this option, the ginning industry would also close down, as it not economically viable to import raw cotton. This would result in the loss of all jobs (1 350) in Spain and an estimated 2 500 in Greece.

5.3.5. Social impact and rural development

Analysis shows that any decoupling rate will ensure the maintenance of farm income. However, the coupled/decoupled regime directly influences cotton production levels. In 2006 in Spain some producers switched to other crops and others reduced their yields, which resulted in an overall reduction of cotton output. The decoupling rate has an impact on both the farmer’s production choice and on the ginning industry.

Table 19: Summary of social impacts

	Option 1	Option 2	Option 3
GREECE			
Farm level	Normal trend of reduction in agricultural holdings	Slight additional impact: a small reduction in hours needed per ha	Slight additional impact: a reduction in hours needed per ha
Ginning industries	Some impact due to over-capacity (loss of 230 permanent and 690 seasonal workers)	Same impact as in Option 1 (loss of 230 permanent and 690 seasonal workers)	Loss of 620 permanent and 1 860 seasonal workers
SPAIN			
Farm level	Normal trend of reduction in agricultural holdings	Slight additional impact: a small reduction in hours needed per ha	Slight additional impact: a reduction in hours needed per ha
Ginning industries	Greater impact due to over-capacity (loss of 175 permanent and 640 seasonal workers)	Loss of 240 permanent and 880 seasonal workers	Loss of 290 permanent and 1 060 seasonal workers

The current Rural Development programmes have enabled cotton production to continue in the Nitrate Vulnerable Zones of regions like Andalucía and Thessaly, where restrictions are imposed on fertiliser use. This is also beneficial for the ginning industry, whose supply of raw cotton has continued.

Axis I of the Rural Development measures can be used to maintain the competitiveness of agricultural activities and to support re-orientatation to other crops. Similarly, these measures can be used to help restructure or re-direct the ginning industry to other processing and/or marketing activities.

Axis III measures can be used for investment and training for economic diversification towards non-agricultural on-farm and off-farm activities, and in particular to support the retraining of the ginning industry work force where necessary.

In 2004 the Commission proposal earmarked a specific additional amount of €103 million within the Rural Development programmes to finance the restructuring process in cotton-growing regions. Subsequently, in April 2004, the Council decided to reduce this envelope to €22 million. In the framework of 2007–2013 Rural Development programmes a total of €154 million has been allocated to cotton-growing regions as additional Community support.

5.4. Impact on International Relations

5.4.1. Background

- Global cotton production in the 2006/2007 marketing year was 25.4 million tonnes. The main producers are China, the US and India which together account for over 60% of the world's cotton production[33].
- EU production represents only 2% of global output and 2% of world consumption. EU trade in cotton is completely free: no import duties or quantitative restrictions apply and no refunds are paid on exports.

Cotton remains an internationally sensitive issue. A number of developing countries and NGOs have criticised the trade-distorting policies of some developed countries and/or main cotton producers, which they claim damage their domestic production. However, a clear distinction should be made between the EU and the US.

The EU both imports and exports cotton (lint), but in net terms, it is an importer. Its trade has declined and it is a relatively small actor on world markets. By contrast, US exports have greatly increased in recent years and the US has consolidated its position as the world's leading exporter of cotton.

In the context of the WTO's Doha Development Agenda (DDA) it has been agreed that the aim should be to make ambitious, rapid cuts in trade-distorting domestic subsidies for cotton production.

The EU's 2004 reform of its cotton regime replaced price support by a system based mainly on decoupled income payments, so moving the regime from the amber box to the green and blue boxes. US support for cotton remains largely amber box and so subject to reduction.

The "box" classifications given for each option refer to the system currently in place.

5.4.2. Impact of the reform options

A return to deficiency payments would contradict the EU's negotiating position in the "Doha Round". Production aid for cotton would be classified as amber box.

The 2004 reform reduced the trade-distorting effect of EU subsidies granted to cotton. The decoupled aid paid as farm income support is classified as green box. The coupled aid granted per hectare of cotton, limited to a fixed base area, is a blue box payment.

A higher level of decoupling would increase the green box element and reduce the blue box element.

A fully decoupled support regime would be consistent with the EU's negotiating position in the "Doha Round". The decoupled payments would be classified as green box.

---

[33] Further details of the EU and world cotton economy are provided in Annex 5.

5.5. Impact on the EU budget[34]

Under the 2004 reform the annual budget for cotton was set at €803 million, which was equivalent to average annual expenditure for the cotton regime in the 2001–2003 reference periods. The final decision allocated this amount as follows: €502 million for decoupled aid, €275 million for coupled aid, €22 million for rural development measures in the cotton growing regions, and €4 million for inter-branch organisations. None of the aid is allocated directly to ginners.

The three options assessed are all budget neutral compared with current expenditure.

Aside from the additional cost of controls, the *Production Aid Option* implies high variability in Community spending. Under the "deficiency payment" system, aid changed every year on the basis of the highly variable world market price. In the period 1995–2005 Community spending varied annually between € 740 million and € 952 million.

Spending under the *Mainly Decoupled Option* is far more stable, as the decoupled part of the aid is fixed. The only variable element is the area payment, which could only decrease, if the area under cotton falls.

While in the Commission's 2004 proposal, the amount for rural development was set at € 103 million and the decoupled payment was reduced by the corresponding amount, the Council finally decided to earmark only € 22 million for rural development measures, preferring to further increase the decoupled payment budget.

Given the high stability of the decoupled payment, the *Full Decoupling Option* is the most stable and predictable from the point of view of EU expenditure.

5.6. Impact on Administrative Costs[35] and Simplification

The *Production Aid Option* implies the establishment of a deficiency system similar to that in place before the 2004 reform. A return to this system would entail significant adjustment costs, not only for the Commission administration, but also for national and regional authorities that have now implemented the new regime for almost two years, and for businesses that have adapted to the new system.

For the ginning industry, the granting of deficiency aid required information on production volumes of ginned and unginned cotton. Associated with this, an advance payment system required a guarantee system. This went hand-in-hand with a complex system of contracts between farmers and ginners, and a system of aid applications to be completed by the ginner.

Member States and/or regions would have to carry out checks on areas sown, on contracts between ginners and farmers, on the production of ginned cotton and on the cotton ginning rate. In addition they would have to define, implement and control specific environmental rules for cotton.

For the Commission administration this regime required the constant monitoring of world prices, which were the basic element for fixing the level of aid. Other important elements for

---

[34] See also detailed expenditure tables in Annex 9.

[35] Detailed tables for each Option are provided in Annex 11.

determining aid payments concerned production levels; these were provided by the interested parties and were difficult and costly to verify.

In summary, this option is extremely complex and burdensome for both beneficiaries and public administrations.

Table 20: List of measures currently entailing administrative costs

OPTION 1						
Information to be notified or tasks to be fulfilled	Producers	Ginners	Member States	Commission	Timing/ Frequency	Compulsory/ Optional
Quality of unginned cotton		X			every delivery	O
World market price of unginned cotton				X	every 10 days	C
World market price of ginned cotton				X	every day	C
Estimated unginned production			X	X	twice a year	C
Determination of actual unginned production			X	X	once a year	C
Reduction of guide price				X	three times a year	C
Total budget expenditures				X	once a year	C
Calculating and fixing aid				X	once a year	C
Determination of the total eligible quantity				X	once a year	C
Aid application		X			every delivery	C
Security referred to aid application		X			every delivery	C
Application of supervised storage		X			every delivery	C
Notification of quantity of ginned cotton		X			once a year	C
Granting advances on the aid			X		every aid application	C
Establishing security for advance on the aid		X			every delivery	C
Provisional reduction of the guide price				X	twice a year	C
Payment of advance on minimum price		X			twice a year	C
Application for area aid under IACS	X				once a year	C
Submission of contracts		X			several times a year	C
Stock records		X			continuous process	C
Checks: areas and productions			X		once a year	C
Penalty scheme			X		once a year	C
Communications Reg.1591/2001 (Art 15)			X		several times a year	C
Report on environmental situation			X		before end 2004	C
OPTION 2						
Information to be notified or tasks to be fulfilled	Producers	OIA	Member States	Commission	Timing/ Frequency	Compulsory/ Optional
Objective criteria for approval of eligible areas			X		once	C
Authorisation of varieties for sowing			X		once	C
Fixing the minimum plant density			X		once	C
Agronomic practices			X		once	O
Calculating the amount of aid			X		once per year	C
Authorisation of inter-branch organisations			X		once per year	C
Operating rules for inter-branch organisations		X			once	C
Aid differentiation (scale)		X			once	O
Classification of cotton parcels for the scale		X			once per year	O
Communications			X		once per year	C
OPTION 3						
Information to be notified or tasks to be fulfilled	Producers		Member States	Commission	Timing/ Frequency	Compulsory/ Optional
Calculating producer's entitlement to aid			X		once	C
Aid application	X				once per year	C
Cross-compliance Annex IV of Reg. 1782/2003			X		once per year	C
Cross-compliance Good agronomic practices			X		once per year	C
Administrative controls: - cross-check			X		once per year	C
Administrative controls spot-check			X		once per year	C

The *Mainly Decoupled Option* would establish a support system similar to the post-reform regime, which has now been operational for nearly two years. Adjustment costs would therefore be minor.

Compared with the management of deficiency payments, the administration of direct payments is lighter and derives mainly, if not exclusively, from the decoupled and coupled payment system.

The coupled payment requires the control of areas, but these are comparatively simple and can be carried out together with controls for other crops.

The decoupled payment benefits from the mechanisms put in place for the Single Farm Payment and so the marginal cost for its implementation is fairly low.

Overall, this option is administratively simpler than Option 1 and entails lower costs.

Although the *Full Decoupling Option* entails a change to the regime now in force, adjustment costs would be relatively light. As the system would be close to that for other reformed sectors, no major modification to administrative mechanisms would be necessary.

The management of this option is lighter than for the other two. The absence of any crop specific payment reduces both the costs and the risks related to controls.

This option has the further advantage of being in line with the reformed CAP, whose central element is the decoupling of income support. Under this option, cotton production would be subject to the common rules for direct support.

5.7. Governance and Participation

There is little participation by beneficiaries in the governance of the *Production Aid Option*. Management is carried out by central authorities and the mechanism for fixing and granting aid is quasi-automatic.

The *Mainly Decoupled Option* implies a higher degree of subsidiarity:

- decisions concerning the purpose and content of supplementary aid payments and agri-environmental measures require cooperation between stakeholders and public authorities;
- for the coupled part of the aid, the definition of eligibility criteria, such as land and varieties, necessitates close interaction with the sector;
- the conception and application of rural development programmes calls for consultation and collaboration, to ensure that the needs of the regions affected by the reform of the cotton regime are met.

The effect on good governance and participation of the *Full Decoupling Option* should be similar to Option 2.

This option offers total subsidiarity to the farmer, who will have greater flexibility and freedom as to the choice of farming activity, without any loss of direct income support.

Rural development programmes for the ginning industry would require maximum collaboration from the sector, within the region and/or Member State.

6. COMPARISON OF OPTIONS

Option 1 complies fully with the provisions of the Accession Protocol and ensures the highest employment levels in the cotton industry, at least in the short term. However, it diverges from the mainstream of the CAP reform process, as well as the overall thrust of EU policy towards simplification, subsidiarity and budget control. Its approach has the effect of undermining the long-term competitiveness of the sector. It does little to meet public concerns regarding the environment and sustainable development. On the international front, this option is contrary to the EU's negotiating position in the DDA and may appear inconsistent with the EU's development policy, in particular *vis-à-vis* less developed cotton-producing countries.

Option 3, which is fully in line with the objectives of the CAP reform process and simplification, fails to comply with the provisions of the Accession Protocols regarding the support of cotton production in the relevant regions. It would therefore require a modification to these Protocols. Implementation of this option would seriously threaten the existence of the EU cotton sector. This option has the advantage of stabilising farm incomes. It allows farmers greater freedom of choice and would be positive for the EU's international relations. Although there are risks associated with the most probable replacement crop, maize, in the long term this option could be environmentally positive.

Finally, *Option 2* strikes a balance between Options 1 and 3. It brings the cotton regime into the mainstream of the CAP reform process and responds to the goal of simplification, while also respecting the provisions of the Accession Protocols regarding support for cotton production. It provides momentum for the cotton sector to move in the direction of long-term viability and promotes the sustainable development of the cotton-producing regions. It ensures a fair income to farmers, enhances the competitiveness of the sector and goes a long way to meeting public concerns regarding the environment. On the international front this option, while not perfect, is quite acceptable, especially in view of the small scale of the EU cotton sector. Overall, this option best meets the different objectives of the reform, particularly if it is linked with a minimum quality standard and harvesting obligation.

A comparative overview of the extent to which the three options would be likely to achieve the different objectives of the reform is given in Table 21.

Table 21: Comparison of likely impact of the Options

☺☺☺, ☺☺, ☺ for positive impacts ☹☹☹, ☹☹, ☹ for negative impacts

Likely impact on	Option 1 Production aid	Option 2 Mainly Decoupled	Option 3 Full Decoupling
Production of cotton	Expanding area, yields and production. ☺☺☺	35% coupled payment allows continuation of cotton production although at lower yields. A further decrease to coupled area payment could lead to a serious fall in production. The introduction of a harvesting obligation associated with a minimum quality requirement would guarantee quality. ☺☺	Alternative crops are more profitable than cotton. Cotton production likely to collapse with knock-on effect on ginning industry. ☹☹☹
Income	The expansion of production beyond a certain NGQ triggers the reduction of the aid. This is more harmful for the most fragile areas and small producers. Lower stabilisation of income than with decoupled payments. ☺☺	Income support goes directly to farmers and stabilises their income more, while allowing them to react to market by switching to other crops. RD measures help reorientation process of agricultural holdings. ☺☺☺	Decoupled income support directly benefits farmers and leaves them to choose the most profitable farming activity. Provides good income stability. ☺☺☺

Market orientation	Price support weakens entrepreneurial initiative along the whole chain. Possible rent-seeking behaviour. Necessary restructuring process and consolidation slowed down, so keeping competitiveness of the industry at relatively low level. ☹☹	Ginning industry competitiveness strengthened by rural development measures. ☺	Only profitable and quality production will continue. ☺☺
Simplification	Very complex and burdensome for both beneficiaries and administrations; controls costly and difficult; regime partly based on data provided by beneficiaries. ☹☹☹	Relatively simple; administrative burden moderate. ☺☺	Simple; administrative burden low, in common with other reformed sectors. ☺☺☺
Subsidiarity	Very low level of subsidiarity ☹☹☹	Good agricultural and environmental conditions, together with supplementary aid, environmental and rural development measures to be defined at MS level. ☺☺☺	Good agricultural and environmental conditions, together with supplementary aid, environmental and rural development measures to be defined at MS level. ☺☺☺
International commitments	In contradiction with EU negotiating position in DDA; open to criticism from developing countries. ☹☹☹	Consistent with EU negotiating position in DDA. Low criticism from developing countries. ☺☺	Consistent with EU negotiating position in DDA. No negative impact for international relations. ☺☺☺

Social	Normal trend of reduction in agricultural holdings; some long-term reduction in ginning industry employment, due to over-capacity. ☹	Slightly higher impact than Option 1; switch to relatively less labour-intensive production systems and crops, in addition to down-sizing of ginning industry. ☹☹	Slightly higher impact than Option 2; switch to relatively less labour-intensive crops, in addition to closure of most ginning plants. ☹☹☹
Environment	Incentive to expand areas, yields and production. Negative impact on environment ☹☹	Some possible environmental risk associated with replacement of cotton by maize. Encourages low-input low-yield production system. Cross-compliance applies. ☺ / ☹	Environmentally positive, although risks associated with probable replacement by maize. Cross-compliance applies. ☺ / ☹
Budget	Highly variable despite stabilising mechanism ☹	Rather stable ☺☺	Absolutely stable ☺☺☺

7. MONITORING AND EVALUATION

Monitoring and assessing the economic, social and environmental effects of EU public policies has become a standard part of the political process, in order to propose further action or redirection of the measures, if necessary.

The reformed cotton policy will be monitored in respect of the whole range of potential impacts identified in section 5 of this report. Progress towards meeting the objectives listed in part 3 will also be assessed.

The new cotton regime will be included in the multi-annual evaluation programme for CAP policies.

7.1. Monitoring in the cotton sector

Many of the procedures necessary for the application of the cotton regime have been developed by Member States and relevant stakeholders. Considerable experience in monitoring exists in the Commission services and in the Member States. However, existing statistical systems covering cotton production, market trends, micro- and macro-economics, the evolution of regional patterns and the environment represent a complex framework that needs to be simplified, adapted and reshaped to provide adequate information.

Table 22: Indicators for monitoring cotton

	International analysis	***Source***
Proposed: DG AGRI	Main world producers and consumers: current situation and trends	FAO, FAPRI, USDA outlook
	Main traders by products and regions	COMTRADE
	Net-trade	FAO/COMTRADE/ICAC
	Prices	UNCTAD/FAO/WB/Cotton Outlook
	Border protections: comparison of tariffs and quotas (e.g. EU versus US)	WTO/AMAD/OECD
	Internal support: comparison of price and budget support (e.g. EU versus US)	WTO/WB/ICAC
	International issues	WTO /FAO/OECD/NGOs
	Domestic analysis	***Source***
	Economic importance of cotton in the producing region	MS/EUROSTAT
	MS producing cotton: volumes, areas and yields – current situation and trends	EUROSTAT
	Structural analysis of the EU cotton holdings	EUROFARM
	Income of cotton farm	FADN
	The cotton system and the reform	DG AGRI
	EAGF expenditure	EU Budget

The Commission is responsible for monitoring the proper implementation of the provisions that apply to the cotton-specific aid. In this context, Member States are required to transmit information, in particular regarding the implementation of cross-compliance and respect of good agricultural and environmental conditions (e.g. statutory management requirements, agronomic practices, rotation and soil maintenance).

The Commission services have already defined a series of indicators that cover economic and social dimensions. These will be completed by relevant indicators referred to in the Communication on the development of agri-environmental indicators for monitoring and integration of environmental concerns into the common agricultural policy[36].

Table 16 lists the core elements that DG AGRI will keep under review, in respect of the EU situation and its linkage with world markets. The potential sources of information are also indicated.

Given the relevance of the family labour in the cotton sector and the importance of this sector in certain areas of Greece and Spain, supplementary indicators will be used to capture the main effects of the cotton regime. Specifically:

Relevance of cotton in terms of area (%) in Macedonia and Thessaly (Greece) and Andalusia (Spain):

$$\frac{\text{Agricultural area utilised for growing cotton (ha)}}{\text{Total utilised agricultural area (ha)}} * 100$$

Family labour in the cotton sector compared with the total agricultural sector (%)[37]:

$$\frac{\text{Family labour/regular labour for cotton sector}}{\text{Family labour/regular labour for agricultural sector}}$$

The variables used to monitor the impact of EU cotton policy on local production systems in developing countries, in particular Benin, Burkina Faso, Mali and Chad, are listed in Table 17.

Table 23: Indicators for monitoring cotton in developing countries

Production in Developing Countries
Importance of cotton in the producing countries
Production volumes
Production yield and quality
Labour use in cotton production
Structural analysis of the cotton production
Environmental impact of cotton production
Markets and Prices in Developing Countries
Domestic prices
Export prices
Export (Volume and Value) by destination
Commercial infrastructures: structure and ownership

These monitoring activities will provide the information needed to meet the commitment made by the Commission in the Agricultural Council of 22 April 2004, to prepare a report for submission to the Council and the European Parliament by the end of 2009. The monitoring has already been initiated by DG AGRI.

---

36 COM(2006) 508 final published on 15.9.2006.

37 Values higher than 1 show a relatively greater family labour specialisation for cotton compared with the whole agricultural sector, vice versa for values lower than 1.

COTTON IMPACT ASSESSMENT

ANNEXES

ANNEX 1 – LIST OF MEETINGS

Date	Name	Participants
02/06/2006	Cotton Advisory Group	Cotton sector
27/09/2006	COPA/COGECA	Mrs E. Corral Mrs B. Reithmayer
27/10/2006	Management Committee for Natural Fibres	Delegates to the Management Committee
27/10/2006	Cotton Advisory Group	Cotton sector
15/12/2006	Management Committee for Natural Fibres	Delegates to the Management Committee
20/12/2006	Cotton Inter-Service Group No 1	AGRI, BUDG, DEV, EMPL, ENV, OLAF, SG, TRADE
11/01/2007	Consultation with the Legal Service of the Commission	DG AGRI Units H1 + C1
30/01/2007	Management Committee for Natural Fibres	Delegates to the Management Committee
02/02/2007	Interservice Steering Group meeting No 2	AGRI, BUDG, DEV, EMPL, ENV, OLAF, SG, TRADE
02/02/2007	Kick-off meeting socio-economic study	ISG + LMC
20/02/2007	Kick-off meeting environmental study	ISG + Oréade-Brèche
28/02/2007	Management Committee for Natural Fibres	Delegates to the Management Committee
30/03/2007	Management Committee for Natural Fibres	Delegates to the Management Committee
17/04/2007	Meeting with the representatives of Junta de Andalusia	Secretary General + Permanent Representation of Spain + DG AGRI and ISG

27/04/2007	Cotton Advisory Group	Cotton sector + ISG
27/04/2007	LMC presentation of the ginning industry	ISG
24/05/2007	LMC presentation of 2nd interim report	ISG
24/05/2007	Oréade-Breche presentation of 1st interim report	ISG
25/05/2007	Management Committee for Natural Fibres	Delegates to the Management Committee
25/05/2007	Workshop organised by DG DEV on development issues, with development NGOs	DEV, AGRI + NGOs
08/06/2007	Presentation about the effects of CAP reform on Greek agriculture by Prof. Stelios Rozakis, Department of Agricultural Economics & Development of the Agricultural University of Athens	DG AGRI + ISG
21/06/2007	LMC presentation of 3rd interim report	ISG
21/06/2007	Oréade-Breche presentation of 3rdinterim report	ISG
21/06/2007	Workshop organised by DG EMPL on employment issues, with employer and employee representatives	EMPL, AGRI, and COPA-COGECA/EFFAT
03/07/2007	Ad hoc cotton working group of the CAP Advisory Committee	DG AGRI, COPA / COGECA, industry, farmers, trade
10/07/2007	Workshop organised by DG AGRI on environmental issues	Representatives of the Agricultural University of Athens (Professors Giourga and Vlahos) and COPA/COCEGA
11/07/2007	LMC presentation of the final report	ISG
13/07/2007	Presentation and discussion on first draft of the Impact Assessment	ISG

Commission Directorates General and Services invited to participate in the Inter-Service Group

Budget (BUDG)

Development (DEV)

Economic and Financial Affairs (ECFIN)

Employment, Social Affairs and Equal Opportunities (EMPL)

Enterprise and Industry (ENTR)

Environment (ENV)

Eurostat (ESTAT)

European Anti-Fraud Office (OLAF)

Regional Policy (REGIO)

External relations (RELEX)

Secretariat-General (SG)

Legal Service (SJ)

Trade (TRADE)

ANNEX 2 – STAKEHOLDER CONSULTATIONS

Summary of the meetings

A2.1 Regular meetings

On a regular basis the services of the Commission presented the timetable of the two studies concerning the environment and the socio-economics aspects of the cotton sector covering following points:

1. Presentation of the terms of reference of the evaluation study of the environmental and socio-economic impacts of the CAP reform measures of the cotton regime.
2. Informing the steering committee on the launching of an internet consultation concerning economic, environmental, employment, consumers, international trade aspects + request of suggestions
3. Presentation of the current situation of the cotton sector in the EU and the world
4. Presentation of the methodology of the evaluation study concerning the environmental aspects of cotton
5. Presentation of the family of possible options and the progress of the external studies on cotton:
   - production aid option
   - partial decoupling option
   - full decoupling option
6. The Commission expressed its interest to collect information on socio-economic, environmental and employment issues (see seminars)
7. Timing:
   a. the first draft of the Impact Assessment (before summer break)
   b. submission of the draft to the Impact Assessment Board
   c. finalisation of the Impact Assessment
   d. adoption of the Commission proposal (November 2007).

A2.2 Workshops

The objective of each workshop was to understand the concerns of stakeholders on the reform in the socio-economic, environmental and international (development) issues in order to prepare the impact assessment process.

A2.2.1 DG Development in collaboration with DG Agriculture

On 25 May 2007 DG Development organised a meeting with the development NGOs, during which the Commission's representatives presented the world market of cotton as well as the possible scenarios for the future reform.

Main concerns of the representatives of the interested NGOs included the consequences of the reform on the WTO negotiations. For them the proposed scenario cannot result in a return to practices not advised under the WTO agreement. Another issue concerned the implications of different options on particular stakeholders of the cotton sector (farmers and ginners) – the consequences shall be much more important for the ginners. The participants asked if the agri-environmental aid could be considered as a specific production aid. The Commission's

representative replied that the agro-environmental aid is an additional compensation to a farmer for going beyond the compulsory standards (cross-compliance).

A2.2.2 DG Employment in collaboration with DG Agriculture

On 26 June 2007, DG Employment organised a meeting and social partners from COPA GEOPA and EFFAT, who act as European social partners in the framework of the agriculture social dialogue committee. After a presentation of the main issues of the reform, the social partners were called to shed light on the different policy options linked to the reform.

EFFAT expressed its concern about the restructuring of the European Regions whose cotton activities will be affected and asked for special aids and tools in order to help these European agricultural Regions. COPA GEOPA expressed its concern about employers' activities disappearance, incomes upholding, age structures, possibilities of vocational training while conversion and European funds that should be allocated to balance this situation. The Greek and Spain experts from COPA GEOPA explained the importance of cotton in Greece and raised the issue of competition of this industry and stated that cotton was mainly developed in Andalusia, which is an Objective 1 region, according to FEDER. In Andalusia there has been no alternative for this region and big investments have been made in this activity for years. DG Agriculture recalled that the Court did not question the approach to the reform, which had been agreed by the Council, and that written contributions should be sent to DG Agriculture before the end of July 2007, in order to be taken in to account in the impact assessment.

A2.2.3 DG Agriculture on environmental issues

The objective of this consultative group (10 July 2007) was to give the possibility to debate on the absolute and relative (compared to the other alternative crops) environmental impacts of cotton. Participants were two experts from the Greek WWF – Professors Giourga and Vlahos; Spanish experts accompanied COPA-COGECA and officials from DG Environment and DG Agriculture. The first part consisted of a general presentation of the cotton sector and the environmental aspects of cotton. The second part consisted of a discussion to understand the good and bad practices in cotton cultivation, the environmental opportunities (water use, fertiliser use, pesticide use, rotation, comparison between alternative crops, GMOs).

Main conclusions after a discussion were that:

- when considering maize as an alternative crop to cotton the main constraint will be the water restriction and maize is not necessarily better for environment than cotton. The needs in terms of water for 100 ha of cotton are equal to 70 ha of maize and 30 ha of dry culture;
- water quantity both in Greece and Spain will be the limiting factor in the future for irrigation crops (as producers are not paying the actual water cost currently). Changes may occur in 2009 when the water pricing requirements of the Water Framework Directive will have to be implemented;
- in Thessalia (Greece), farmers are continuing to produce cotton as agri-environmental payments are making it profitable do so;
- Spain has made a lot of effort to introduce integrated production schemes which has improved the environmental performance of the cotton crop (e.g. no more plastic use, limitation of fertilisers under Nitrate Directive).

Also a meeting was attended (6 June) on the concerning the impact of pesticides with PAN (Pesticide Action Network) and EJF (Environmental Justice Foundation) in which they explained the worldwide impact of pesticide use of cotton on environmental and health issues

A2.2.4 Ad hoc Consultative group on Cotton (organised by DG Agriculture)

On 3 July a meeting was organised to give stakeholders the possibility to express their main concerns, priorities and opportunities for the new proposal for the reform of the cotton regime.

A presentation was given as an introduction to the discussion dealing with the following matters, the current situation of the cotton regime (quantity and quality), the international context, the structure of the producers and the ginning industry, the economics of cotton production, the environmental aspects and the different scenarios that will be analysed before a new proposal will be done. The participants were asked to comment on the different scenarios and their impact on cotton production (quantity and quality), processing industry, agriculture at regional level, employment and environmental issues.

Main conclusions were:

- certain levels of cotton production should be maintained, as this is an obligation that forms part of the accession Protocols of Spain and Greece;
- the cotton industry plays an important role as it forms the primary production in areas where there is a high concentration of cotton production (e.g. Thessalia);
- the quality of cotton was a main concern of the members present, as under the current reform the coupled payment is based on the opening of bolls. A possible solution is the obligation to harvest which would involve a higher supply to the ginning industry;
- the environmental issues play an important role and the environmental impact can be reduced through alternative practises and agri-environmental practises (integrated production). Concerning the alternative crops: growing cotton uses less irrigation water than maize, but differences in terms of pesticides and other environmental damaging aspects should be analysed in detail;
- the cotton sector may have to consider product differentiation creating a niche-market compared to the world market (e.g. high quality cotton). Traders and the representatives of the industry underlined the interest to promote the EU quality cotton;
- an aid for restructuring the industry should be considered, as ginning plants are closing and under the new regime the production may decline to a lower level;
- EFFAT raised the fact that a loss employment in the cotton sector is bound to happen.

A2.3. Public consultation: Executive summary of the internet consultation

As part of a general stakeholder consultation the aim of this public internet consultation was to collect contributions from a broad range of individuals and organisations that are interested in the EU's cotton policy.

Important limitations in interpretation of the results include the nature of public consultations of this type. Respondents had to be aware of the ongoing consultation, had to have internet access, answers were anonymously (background of the respondent cannot be checked), misunderstanding of questions on complex issues, over-representation of some stakeholders groups. However the latter problem can be overcome if the stakeholders are dealt with

separately instead of together. In view of the above cited limitations, this report does avoid over-interpreting the results in the utmost details.

This document is one of the many documents stemming from the stakeholder consultation process for cotton. The aim of this document is to understand the main tendencies and concerns of each stakeholder category. Also it is important to note that quality of the answers was good and rational according the stakeholder group and has helped the Commission services to understand the priorities of each stakeholder group.

Six stakeholder groups were differentiated farmers, the cotton industry, consumers, experts, government and NGOs. However not all were equally represented. One third of the total respondents were farmers. The cotton industry, experts and the consumers were also well represented (16–18% for each category). In terms of geographical background responses mainly came from Greece and Spain, the main cotton growing areas.

Economic issues prevail as the main point of concern of all stakeholders is the payment scheme. About half of the respondents agree with decoupling. It is mainly the ginning industry that most favours coupling, while experts, government and NGOs are mostly in favour of decoupling (mainly partial, but some also full). About half of the farmers are in favour of completely coupled aid and the other half are in favour of decoupling (mainly partially, but some also fully). In the reform all stakeholder categories (except for the industry) think that the support should go to farmers.

The cotton industry proposes support to both cotton farmers and the industry. Simplification does not seem to be a main concern for most stakeholders. The majority of the respondents responded positively to support cotton, although the NGOs were less in favour. The main priorities among all respondents (except the industry) are keeping environmental friendly production techniques. Also quality concerns were an important priority for different categories (farmers, the industry, consumers and NGOs).

The main environmental problems revealed by all stakeholders are water consumption and pollution. Stakeholders commented that maize and sugar (the main quoted alternatives) use even more water and fertilisers. Main solutions for environmental problems are the use of sustainable farming techniques with fewer inputs. Consumer and quality issues indicate that there is favourable tendency to support high quality cotton but among all stakeholders opinions are mixed whether support should only be limited to these segments of the sector.

From a global point of view all respondents were positive about the future of the demand for cotton. On international issues, farmers and the industry are in favour of maintaining the EU's current 2% share of world production, while NGOs, experts, consumers and government recognise that EU cotton support has a negative impact on developing countries, or believe that the EU should help support African cotton-producing countries.

Social concerns of this consultation highlight the importance of cotton cultivation for the economies of the regions concerned. Many stakeholders fear unemployment and rural exodus if the cotton reform is too drastic. Main alternative options cited are maize and to a lesser extent durum wheat. All stakeholders are in favour of using rural development programmes in cotton areas to improve the quality of cotton and all are in favour of agri-environmental measures (except for the ginning industry).

A2.4. Specific meetings

A2.4.1 Representatives of the Andalusian government

On 17 April 2007 a meeting with representatives of the Junta de Andalucía and the Commission representatives from DG ECFIN, OLAF, DG AGRI C1, D1, Directorate G, G1 was organised. Teresa Saez (Secretary General of Agriculture and Rural Development, Junta de Andalucía) presented the situation of cotton in Spain, the impact of the 2004 reform and the Andalusian proposal for a future reform of the cotton sector.

The Government of Andalusia pointed out that the Judgement of the European Court of Justice was positive because no impact assessment was made in the concerned municipalities, no account had been taken of the decoupled payment on calculating the profitability of cotton, no account had been taken of wages and no impact study had been done on the ginning industry. Two studies (socio-economic and environmental) were made by the government de Andalucía which were presented at the occasion of this meeting.

In a first part the characteristics of cotton agri-business in the Andalusian economy in a pre-reform setting were presented. Cotton agri-business represents 25% of the total employment, 10% of GGP, 90 000 ha of irrigated land, 10 000 farmers (80% family farmers) and 25 ginning plants. There is a complex agro-industrial system associated to the cultivation of cotton (seeds, inputs, machinery), concentrated in the very same area where other reforms are currently being implemented: sugar beet, processed tomatoes.

According to the government of Andalusia the impact of the reform for 2006/07 campaign with respect to 2005/06 involved a 24.8% reduction in crop area (to 62 000 ha), a 45% reduction in yields, the disappearance of the crop in the region of Murcia, 2 000 farmers (about 20%) that abandoned the crop.

The impact on the ginning industry was the following: 5 out of the 25 ginning industries stopped their activity, a decrease of 60% in processed raw material, a quality decrease due to the increasing use of stripper harvester, an increase in fixed costs, a 38% decrease in employment due to less work shifts, smaller campaign length, less temporary employment.

What the Andalusian government is proposing is not to change from the philosophy of the 2003 reform, but to impose a period of adaptation in order to adopt adequate measures for the Region. The Member States should be able to differentiate the coupled aid based on non discriminating specific objectives, like yields or quality, etcetera. The coupled part should involve 70 000 ha in Spain. The following arguments were raised to propose the decoupled part of payment should no be higher than 20%:

- based on the profitability of cotton, with 65% decoupling is negative (based on Andalusian government calculations);
- 46 000 ha is under integrated production, which requires less use of plastic (about 5 tonnes of plastic less than traditional production) and less phyto-sanitary treatment. The agri-environmental aid reaches 60 000 ha of cotton and concerns a payment of €350/ha which is given for integrated production is low and lasts only five years (current regime will be valid until 2013);
- the traditional crop does not involve any obligation to harvest; consequently farmers cultivate the crop until the opening of bolls, wasting irrigation water and energy;

- concerns were noted on the massive move from cotton to other crops, which could translate the problem into other sectors. The region is currently already undergoing effects of implementing the sugar reform;
- in order to allow the whole chain to adapt, it is necessary that the restructuring and/or diversification of the ginning industry (measures like the ones implemented with the sugar reform would be preferred).

A2.4.2 Meeting with Greek Agricultural Economic experts

Prof. Rozakis (Department of Agricultural Economics and Development, University of Athens) was invited to present his work on the "new CAP impacts to cotton growers in Greece". The sample was based on 987 farms cultivating at least 0.1 ha of cotton and the methodology used was mathematical programming. According to the model, the main current results are that a decrease in cotton cultivated area of about 30 percent is to be expected (mainly in Thessaly (41%) and Macedonia-Thrace (37%)). Durum wheat decreases overall (25%) due to dramatic decrease in Macedonia-Thrace and secondly in Sterea. Durum wheat is expected to increase also in Thessaly. It may be replaced by soft wheat (especially in Northern Greece). Alfalfa is considerably increasing (55%) mainly cultivated in Macedonia-Thrace (threefold) and secondly in Thessaly (149%). Maize doubles its acreage. Not harvested cotton is extensively cultivated in Macedonia-Thrace aiming at the coupled subsidy reserved to cotton. Further investigation with regard to slippage or abandonment of activities is still needed.

A2.4. Parliamentarian questions received and 4 letters received from COPA, the Greek ginning association and the Spanish ginners

The notes were answered and considered in establishing a view of the stakeholders.

A2.5. General Conclusions

All stakeholders have had a fair possibility to express their concerns at different moments (January 2007–July 2007), through different contributions (specific meetings, workshops, public consultation, letter and questions) and on different topics (regional, international, development, employment, social, environmental, consumer, quality issues):

It is clear that the current 2004 cotton reform has implied many stakeholders to react as this has had socio-economic and environmental implications in the regions concerned.

From a socio-economic stakeholder's point of view, the employment loss and the possible restructuring of the ginning industry must not be neglected. Stakeholders expressed the needs for special tools and a period for adaptation to help adapt to a possible new regime. The strong regional dependence on cotton in some areas should also be considered. Also very important to consider is that maintaining cotton production is part of the Adhesion Protocol No 4 of Greece

When stakeholders with environmental interests were consulted, it can be noted that although Member states may have done efforts to cotton production in Spain and Greece, the intensive cotton production does have a strong environmental impact in terms of water use and quality and other inputs. Also the impact assessment should consider the environmental impacts of alternative crops, as in some cases these may replace the current cotton production. Finally, the 2003 CAP reform emphasises the importance of cross-compliance measures.

Development and international players highlighted clearly that a proposal should be in line with a strong negotiation position at the WTO and the EU commitments to the least developed countries. At several occasions the conditions of coupled aid in terms an obligation to harvest versus a boll opening were highlighted.

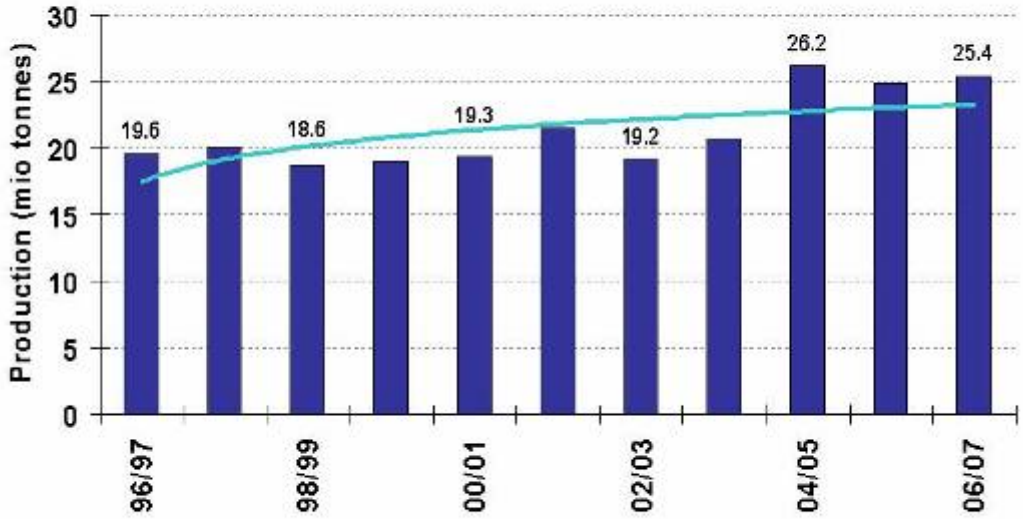
It is clear that a new reform must take into account the stakeholders involved and provide measures for the ones that may be an unfavourable position.

Annex 3 – Presentation of the cotton sector

- Global Market
- Cotton in the EU
- The EU Cotton Regime
- International context (WTO)+ balance
- Structure of producers and ginning industry
- Economics of production

World production of ginned cotton has grown by 6% per annum over last five years

European Commission
Agriculture and Rural Development



3

Production is dominated by China, India and US

European Commission
Agriculture and Rural Development

The share of EU is by 2% (02/03-06/07)

4

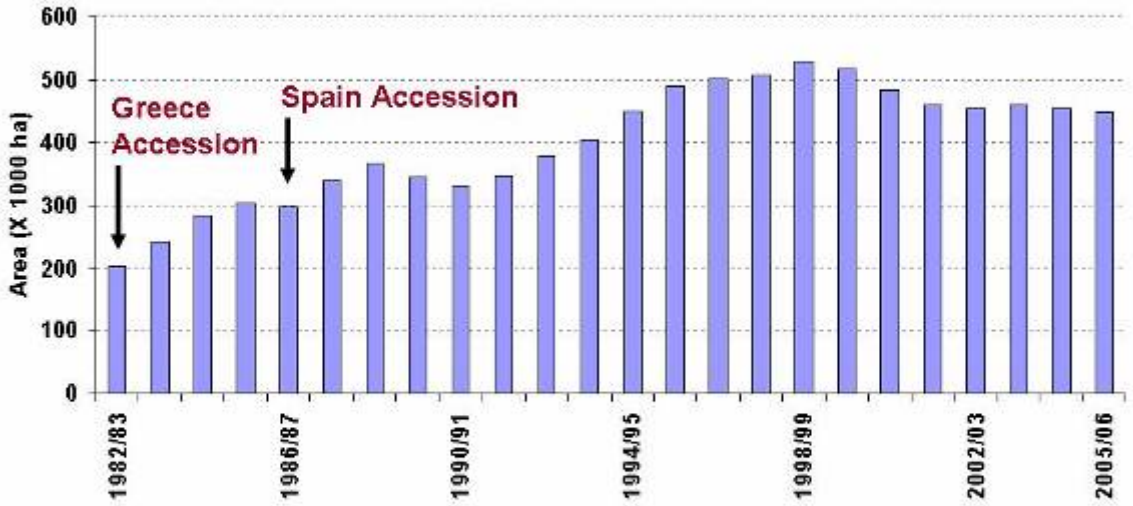
European Commission
Agriculture and Rural Development

Cotton in EU

5

EU Cotton Area

European Commission
Agriculture and Rural Development



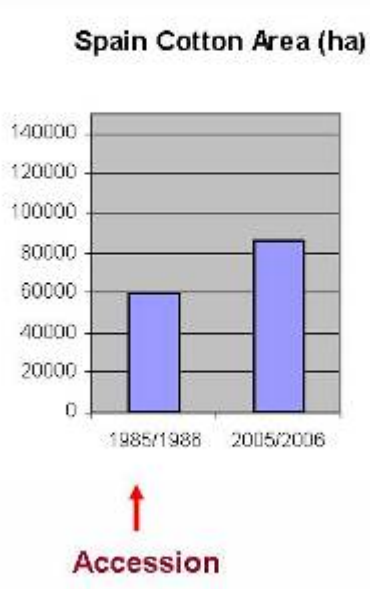
Greece: 82/83 → 137.000 ha
05/06 → 363.000 ha

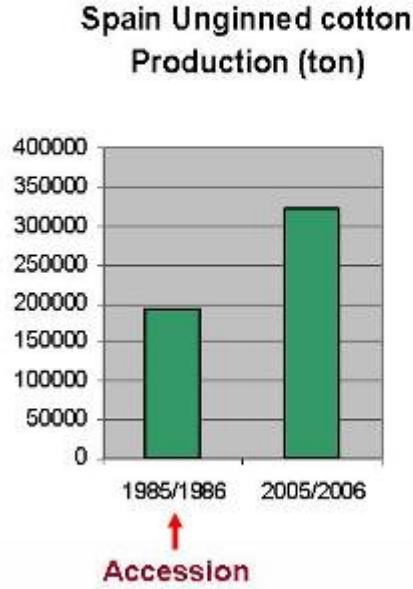
Spain: 85/86 → 60.300 ha
05/06 → 86.000 ha

6

Spain: Cotton Production & Area (2005/06 vs 1985/1986)

European Commission
Agriculture and Rural Development

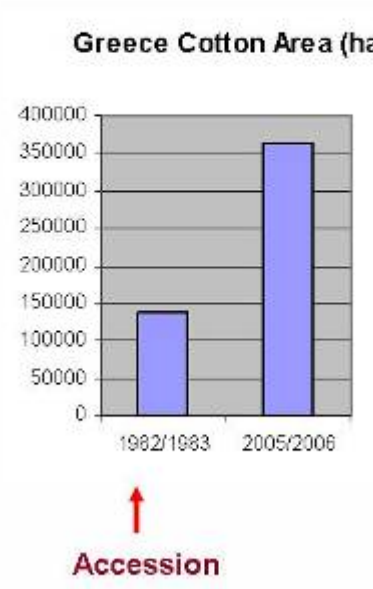


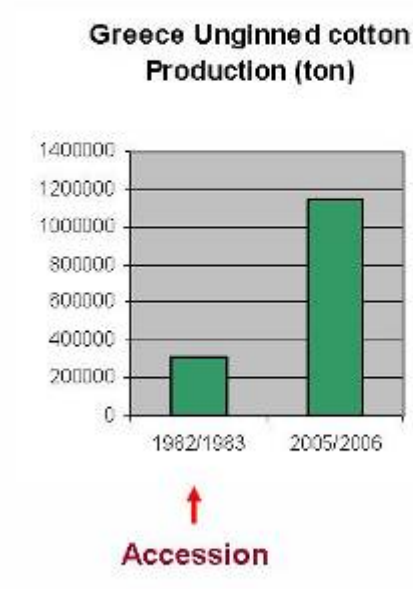


7

Greece: Cotton Production & Area (2005/06 vs 1982/1983)

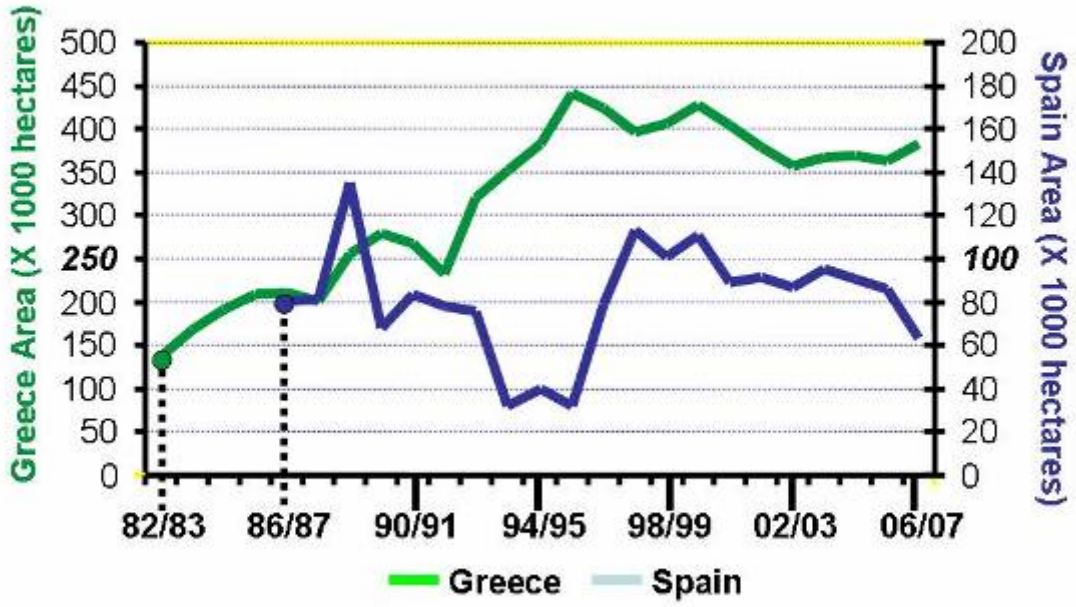
European Commission
Agriculture and Rural Development





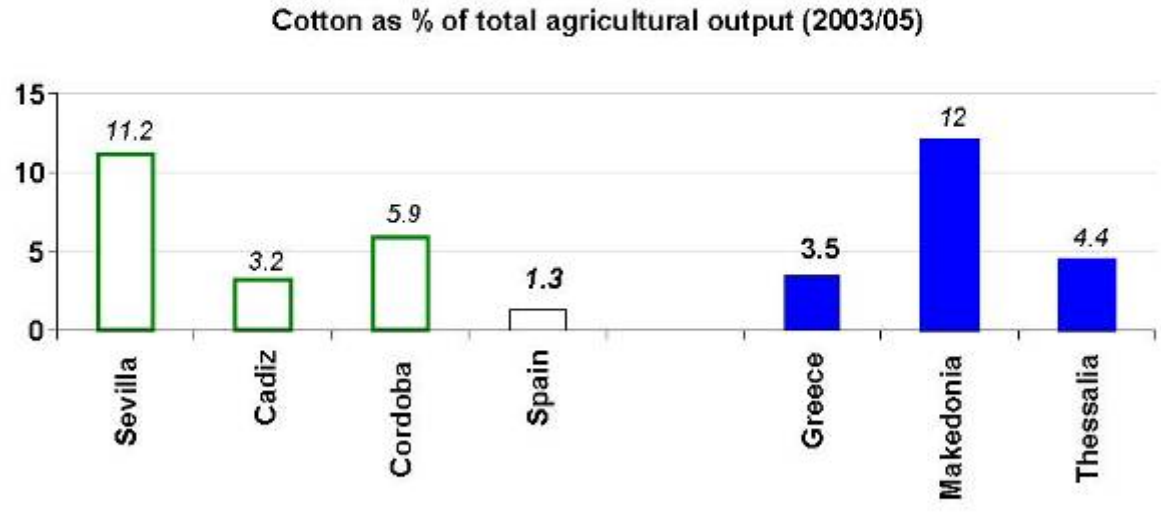
8

EU Cotton Area by Member States



9

Relevance of cotton sector in Spain and Greece agriculture output

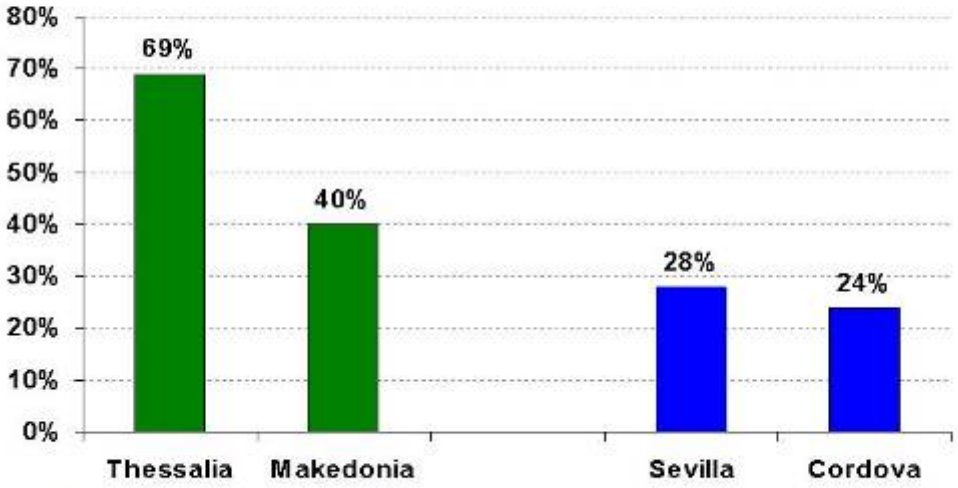


10

Relevance of cotton sector in Spain and Greece agriculture area

European Commission
Agriculture and Rural Development

Share of holdings where cotton area accounts for 50% or more of the total farm area (2003/05)



11

European Commission
Agriculture and Rural Development

EU cotton regime

12

Principles of EU Cotton Regime Prior to 2006

European Commission
Agriculture and Rural Development

- Producers received minimum per tonne price
- Aid was based on difference between guide price and world price
- If production exceeded reference level, a stabiliser mechanism reduced guide and minimum price
- The Aid was paid to the ginners

13

2006 Reforms

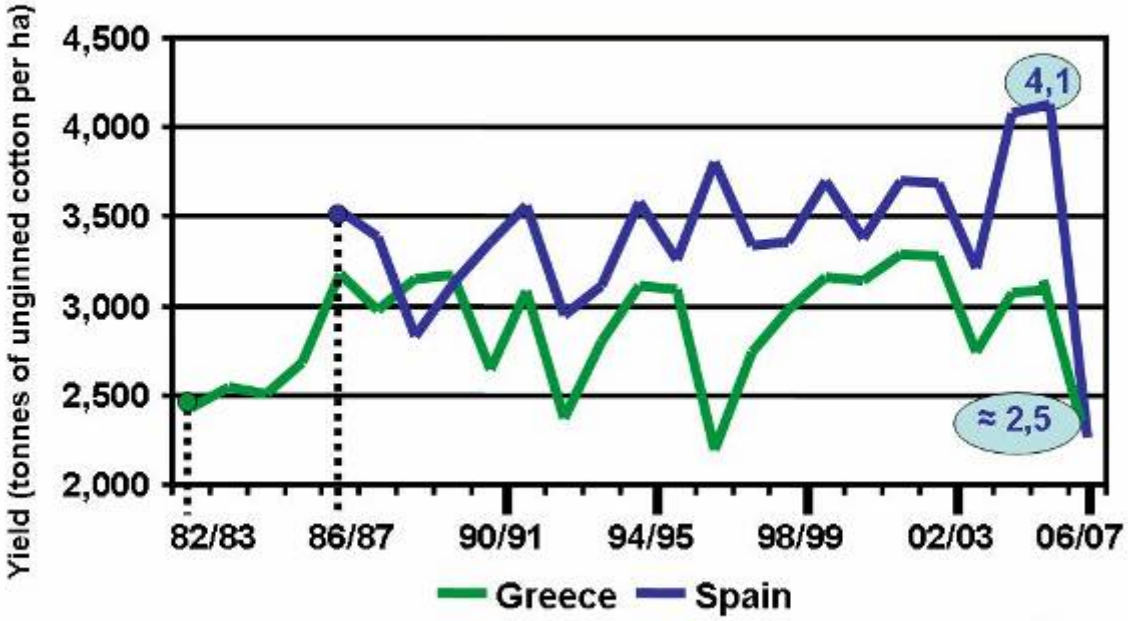
European Commission
Agriculture and Rural Development

- Aid on a per hectare basis
- Partly decoupled
- Coupled aid:
  - Greece: €594 per hectare for 300,000 ha €342.85 for 70,000 ha;
  - Spain: €1,039 per hectare (for 70.000 ha);
  - Portugal: €556 per hectare
- Aid payable on the opening of the bolls (not harvest).
- Payments were made directly to the farmers

14

3. EU Cotton Yields, Unginned cotton

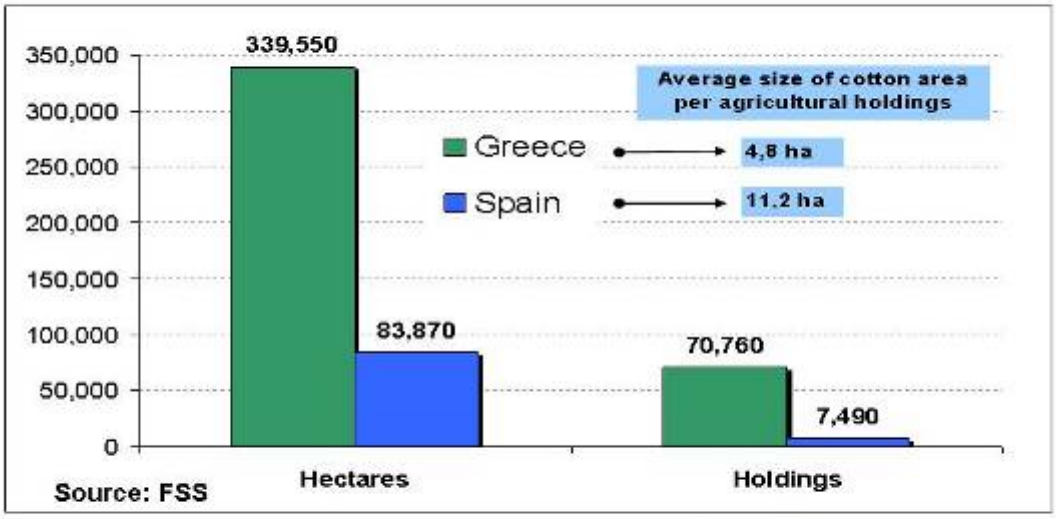
European Commission
Agriculture and Rural Development



15

Holdings and Area in Greece and Spain (2005)

European Commission
Agriculture and Rural Development

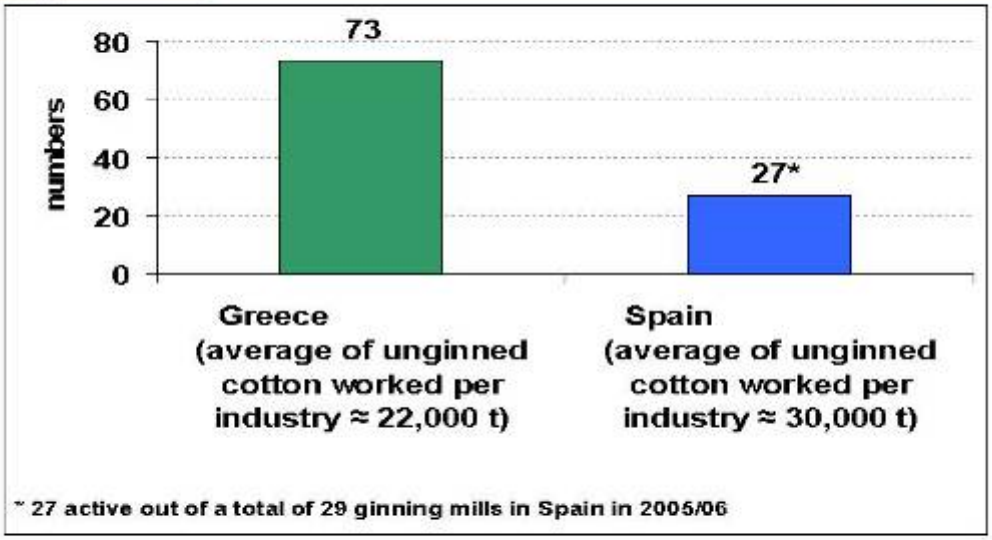


Greece (total hectares and number of holdings) >> Spain
Spain (average size) >> Greece

16

Ginning industry (2005/06)

European Commission
Agriculture and Rural Development

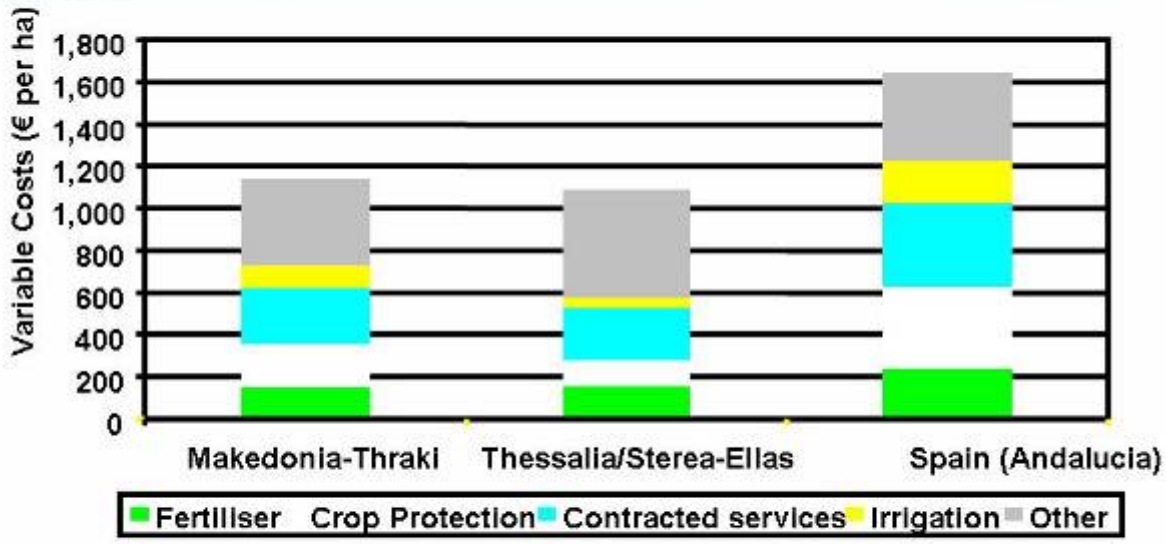


Greece >> Spain

17

Average Variable Costs for Cotton (2003 – 2004)

European Commission
Agriculture and Rural Development



Source: LMC

In Spain variable costs for cotton production are ≈ 45% higher than in Greece

18

Potential environmental effects of cotton production

European Commission
Agriculture and Rural Development

- The use of high amount of phytosanitary products is needed to maximize the yield
  - Pesticides/herbicides/insecticides *(environmental toxicity problems)*
  - Defoliants
- Fertilizer (560 kg of NPK per hectare)
- Irrigation → water use in the cotton sector is around 5.500 m^3 of water per hectare *(100% of land used for cotton is irrigated)*
- Rotation → monoculture and degraded land *(acidification/biodiversity)*

19

Other environmental aspects

European Commission
Agriculture and Rural Development

- Input use
- Alternative Crops
- Agricultural practises
- Production with a lower environmental impact

20

Spain: evolution of input use in cotton sector (2000-2005)

European Commission
Agriculture and Rural Development

Farm Size		Fertilizers	Pesticides	Herbicides	irrigation
<10ha	No Change	100%	100%	100%	100%
10-20ha	No Change	75%	83%	92%	92%
	< 25% decrease	17%	8%	0%	0%
	25% - 50% decrease	8%	8%	8%	8%
	< 25% increase	5%	8%	5%	5%
>20ha	No Change	95%	87%	95%	95%
	< 25% decrease	0%	5%	0%	0%

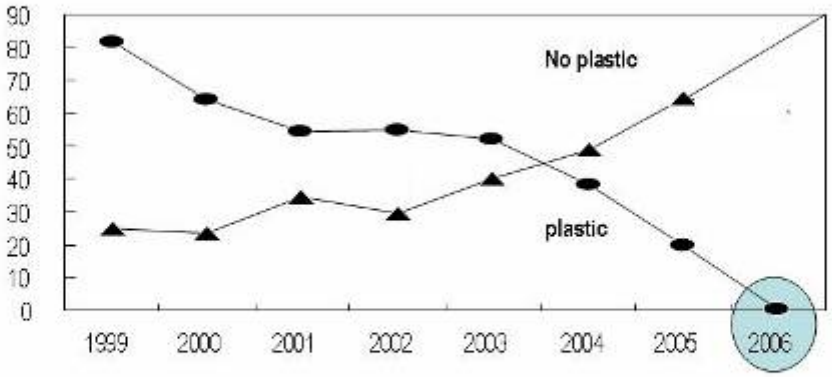
Between 2000 and 2005 the evolution of input use has been not significant:

- **< 10 ha ⟹ 100% of holdings with no changes**
- **10 – 20 ha ⟹ 75~92% of holdings with no changes**
- **> 20 ha ⟹ 87~95% of holdings with no changes**

21

Spain: evolution of plastic cover (1999-2006)

European Commission
Agriculture and Rural Development



Between 2000 and 2006 the utilization of plastic films in the cotton sector has strongly decreased.

22

Greece: evolution of input use in cotton sector in agricultural holdings (2000-2005)

European Commission
Agriculture and Rural Development

	Fertilizers (kg/ha)	*Pesticides, insecticides and fongicides (kg/ha)*	*Herbicides (kg/ha)*	*Irrigation (m3/ha)*
Increase >50%	1,11%	0,56%	0,56%	2,30%
Increase 25% to 50%	32,22%	21,23%	21,11%	14,37%
Increase <25%	15,00%	27,93%	27,22%	14,94%
no changes	**28,89%**	**36,31%**	**42,78%**	**59,20%**
Decrease <25%	14,44%	11,73%	6,67%	6,32%
Decrease 25% to 50%	8,33%	2,23%	1,67%	2,87%
Decrease >50%	0,00%	0,00%	0,00%	0,57%

Summary

Holdings having,	no changes (%)	increase
▪ fertilizers ⇒	29	32
▪ pesticides ⇒	36	28
▪ herbicides ⇒	43	27
▪ irrigation ⇒	59	15

23

Spain: cotton and alternative crops between 1999 - 2003

European Commission
Agriculture and Rural Development

	Area (X 1000 ha)			
Year	Cotton ↓	Maize ↑	Durum wheat ↑	Soft wheat
1999	104.9	15.6	3.6	12.6
2000	84.3	8.3	3.2	13.3
2001	85	25.8	4.7	12.8
2002	82.1	28.2	6.2	14.7
2003	88.6	31.8	6	13

The evolution of the land use in the holdings cultivating cotton showed, between 1999 and 2003:

- » ***Reduction of cotton area***
- » ***Increase of area of maize and (slightly) durum wheat***
- » ***Status quo for soft wheat***

24

Greece - Thessalia area: cotton and alternative crops between 1999 – 2005

European Commission
Agriculture and Rural Development

Year	Cotton ↓	Maize ↑	Wheat ↓	Tobacco	Grassland and fodder ↑
1999	172 676	23 080	179 643	6 494	26 696
2000	160 547	25 222	143 885	5 578	28 284
2001	155 175	24 980	147 103	5 660	NA
2002	150 925	27 868	146 123	5 401	28 718
2003	149 197	30 083	144 895	5 674	30 777
2004	151 406	29 801	143 533	5 515	31 608
2005	149 495	31 674	138 928	4 448	32 157

The evolution of the land use in the holdings cultivating cotton showed, between 1999 and 2005:

- » *Reduction of area of cotton, wheat and tobacco*
- » *Increase of area of maize, grassland and fodder*

25

Cotton and alternative crops

European Commission
Agriculture and Rural Development

Growing cotton is a more problematic cultivation than some other crops, like winter cereals and sunflower, mainly because of:

- Use of water;
- Intensive use of inputs;
- Rotation (mono-cultivation)

26

Spain: agricultural practices between 2000 - 2005

European Commission
Agriculture and Rural Development

- reduction of cotton area;
- abandonment of plastic cover utilization and better management of waste;
- compulsory rotation for holdings bigger than 10 ha;
  - Rotation in the holdings > 10ha (60% of cotton area and 18% of holdings in 2003/04)
- Reduction in water used *(change to drip irrigation, better management of water but higher costs of irrigation water);*
- *Slight reduction in usage of inputs.*

27

Greece: agricultural practices between 2000 - 2005

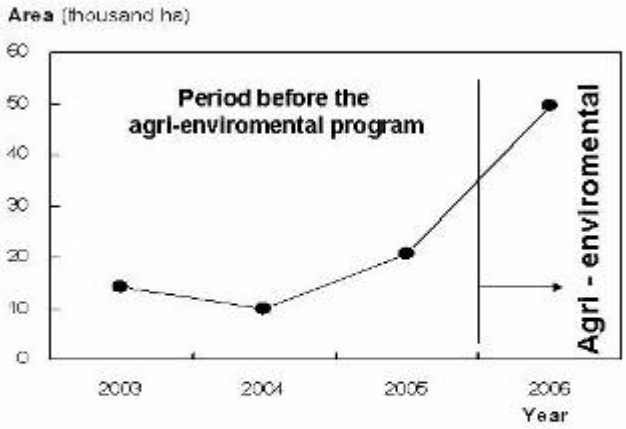
European Commission
Agriculture and Rural Development

- No changes or slight increase in the use of phytosanitary inputs;
- compulsory rotation for cotton area (?);
- cotton, as one crop, is high intensive in Thessalia region (where water irrigation is very problematic);
- programs in accordance with the Nitrate Directive have been applied in vulnerable areas;

28

Spain: evolution of cotton area under agri-enviromental program

- Amount of aid = 350 €/ha



- Compensation for:
  - *reduction of yield*
  - *higher production costs*
  - *monitoring of the scheme adopted (soil analysis, technical support, etc)*

29

Greece: evolution of cotton area under agri-enviromental program

- Amount of aid = 532-600 €/ha *(92.000ha eligible for aid in Thessalia, i.e. 25% of total cotton area in Greece);*
- Compensation for decreasing income due to:
  - *compulsory set aside by 25%;*
  - *reduction in using N by 20%*
  - *crop rotation by 25% of the irrigated crops with dry crops*
  - *monitoring of the scheme adopted (soil analysis, technical support, etc)*

30

Spain: return following the reform to the cotton regime

European Commission
Agriculture and Rural Development

SPAIN	Cotton* Medium yield		Durum Wheat	Maize with 25% coupled	Sunflower
	With AE	No AE			
Price (€/t)	244	244	139	129	233
Yield (t/ha)	2.6	2.6	3.4	12.3	2.0
Coupled payment (€/ha)	1,039	1,039	60	116	60
Agro-environment payment (€/ha)	350				
Supplementary payment (€/ha)	191	191	71		
Quality premium (€/ha)			40		
Total Revenue (€/ha)	**2,206**	**1,856**	**644**	**1,698**	**526**
Variable Costs (excl unpaid labour)	**1,328**	**1,328**	**346**	**1,185**	**317**
Gross Margin (€/ha)	**878**	**528**	**298**	**513**	**209**
Unpaid labour (hrs)	153	153	134	103	60
Return to unpaid labour (€/hr)	**5.7**	**3.5**	**2.2**	**5.0**	**3.5**

SP = Supplementary Payment, Art.69 of Reg. 1782/2003
AE = Agro-Environmental Payment
Prices of maize and durum wheat: average price of the past three years
(*) With Supplementary Payment

31

Greece (Mekedonia-Thraki): return following the reform to the cotton regime

European Commission
Agriculture and Rural Development

MAKEDONIA-THRAKI	Cotton *Normal yield*	Durum Wheat	Maize
Price (€/t)	317	147	143
Yield (t/ha)	3.1	2.6	11.8
Coupled payment (€/ha)	529	0	0
Agro-environment payment (€/ha)	0	0	0
Supplementary payment (€/ha)	0	0	0
Quality premium (€/ha)		40	
Total Revenue (€/ha)	**1,511**	**421**	**1,690**
Variable Costs (excl unpaid labour)	**1,188**	**381**	**1,013**
Gross Margin (€/ha)	**323**	**40**	**677**
Unpaid labour (hrs)	195	79	194
Return to unpaid labour (€/hr)	**1.7**	**0.5**	**3.5**

32

Greece (Thessalia-Thraki): return following the reform to the cotton regime

European Commission
Agriculture and Rural Development

THESSALIA-STEREA	Cotton		Durum Wheat	Maize
	No AE	With AE		
Price (€/t)	309	309	147	143
Yield (t/ha)	3.4	2.5	3.9	11.6
Coupled payment (€/ha)	529	529	0	0
Agro-environment payment (€/ha)	0	542	0	0
Supplementary payment (€/ha)	0	0	0	0
Quality premium (€/ha)			40	
Total Revenue (€/ha)	**1,567**	**1,843**	**611**	**1,661**
Variable Costs (excl unpaid labour)	**1,177**	**1,127**	**429**	**1,049**
Gross Margin (€/ha)	**390**	**716**	**182**	**612**
Unpaid labour (hrs)	220	230	98	194
Return to unpaid labour (€/hr)	**1.8**	**3.1**	**1.9**	**3.2**

AE = Agro-Environmental Payment
Prices of maize and durum wheat: average price of the past three years

33

Concluding remarks on the impact of the 2004 regime

European Commission
Agriculture and Rural Development

- The impact of the 2004 regime has been different in Greece and Spain
- In Greece, there was little change in the cotton area: yield sensitive to weather conditions
- In Spain, both area and yields have fallen
- In Spain, farmers have moved to a lower input / lower output production model
- Agro-environmental payments are important determinants of both margins and profitability

34

ANNEX 4 – DESCRIPTION OF THE EU COTTON REGIME

The EU cotton regime was introduced in 1981 with the accession of Greece into the European Community and expanded with the accession of Spain and Portugal in 1986. Until the reforms of 2004 (which were first implemented in 2006), the main principles of the regime remained largely unchanged, although the scheme was revised six times.

Protocol 4 established a Community support programme for cotton. According to the Protocol, the support system is intended "particularly to support cotton in the regions of the Community where it is important for the agricultural economy, to permit producers concerned to earn a fair income and to stabilise the market by structural improvements at the level of supply and marketing."

Paragraph 3 of Protocol No 4 provided that such a system 'shall include the grant of an aid to production', while paragraph 11 of Protocol No 4, in its original version, both required the Council to review the operation of the support system for cotton and provided it with the *vires* to modify that system. It was on the basis of that paragraph that the Council modified the system since its original adoption.

A4.1 The Regime prior to 2006

Basic Principles of the Regime

The basic principles of the regime were that:

- producers received a minimum per tonne price for unginned cotton;
- this price comprised an unginned cotton price derived from the world market price plus a payment from the EC;
- the payment from the EC was made to the ginners, who then paid the growers.
- the level of payment from the EC was based on the difference between a "guide" price that was fixed by the Council and the world market price;
- growers received a minimum price, which was computed as the guide price minus a permitted administrative cost which was claimed by the ginners;
- the guide price protected growers from fluctuations in the world price, but allowed the ginners to sell cotton fibre at prevailing world market prices;
- when cotton production exceeded certain reference levels, a stabiliser mechanism was enacted which reduced the guide and minimum prices with a view towards reducing grower prices and hence over-production.

Evolution of the Regime

A4.2 1981 – 1985

Under the original scheme[1], the guide price was set annually by the Council and the world market price for unginned cotton was determined by the Commission. In the latter case, where price quotations were not available for unginned cotton, the world price was determined from the value of products obtained from ginning and estimated ginning costs.

Ginners applied for aid from the national authorities no later than the day on which the product entered their undertaking. To allow forward contracts to be negotiated, applications could be made before the product was physically available.

The minimum payment was based on a standard quality unginned cotton which was defined on the basis of its impurity and moisture contents, length and grade of fibres.

The guide price was limited to a maximum guaranteed quantity (MGQ) which the Council set. If production exceeded the MGQ, a stabiliser mechanism reduced the price actually paid to the growers and the aid they received. If the estimated production before the start of the cotton year was greater than the MGQ, the guide price was reduced by 1% for every 15 000 tonnes by which the MGQ was exceeded. In practice, the MGQ was set at 560 000 tonnes and was never exceeded.

A4.3 1986 – 1991

With the accession of Spain and Portugal, among whom only Spain was then a producing country, the MGQ was increased to 752 000 tonnes with effect from the 1986/87 cotton year. In 1987/88[2], to protect growers from a large fall in the minimum price (due to production exceeding the MGQ), a cut-off point was introduced below which the guide price could not be reduced. The cut off was initially set at 15% below the guide price, but later the maximum price reduction was raised to 25%.

There were a number of limitations to the scheme:

- production always exceeded the MGQ between 1986 and 1991;
- although the MGQ was set at 752 000 tonnes, it could be adjusted on the basis of the gap found between actual production and estimated production for the preceding year. Consequently, and despite the operation of a cut off point, the reduction in the guide price fluctuated between 6% and 25% each year;
- the quality of cotton produced in the Community was below the standard that formed the basis of the regime's measures determining prices. This was because the regulations did not take account of organic impurities and so producers had little incentive to produce clean cotton; and
- as aid was payable no later than the day in which the cotton was lodged, this meant that if ginners were unable to sell or hedge that cotton immediately, they were subject to the full risk inherent in fluctuating world prices.

---

1 Council Regulation (EC) No 2169/81.
2 Council Regulation (EC) No 1964/87.

Under Regulation (EEC) No 1152/90 a system of aid for small producers (whose area did not exceed 2.5 hectares) was established. Its purpose was to compensate these producers for the falls in income brought about by the stabiliser mechanism. The aid was set at a level to compensate for the costs involved in hand picking cotton (this aid amounted to ECU 250 per hectare, but the area eligible for payments was limited to 73 000 hectares in order to ensure budget stability). When the area under cotton, exceeded this amount, the aid was reduced in proportion to the extent of the overrun.

A4.4 1992 – 1995

In light of the limitations noted above, the operation of the regime was adapted[3]:

1. annual fixing of the MGQ was abandoned in order to reduce uncertainty at sowing time;
2. the MGQ was no longer adjusted on the basis of the gap between actual and estimated production in the preceding year;
3. the 15 000 tonne tranches for establishing the reduction in the guide price were replaced by a coefficient that was calculated using the overrun on the MGQ;
4. any reduction in the guide price, when actual production was higher than the MGQ, was limited to 20%. However, if the fall in the guide price should have been greater than 20%, any excess was carried over and thus served to reduce the guide price in the next cotton year. This was known as the "cut-off and carry over system";
5. the standard quality of unginned cotton was adjusted to take account of organic impurities;
6. aid applications from ginners could now be lodged after the day in which delivery was made to the ginner.

Production continued to exceed the MGQ and guide price reductions were enacted. An objection that was made to the revised regime was that the uniform reduction in the guide price was felt to be unfair to Spanish growers whose production, in part due to drought, had not expanded, while Greek production continued to expand.

A further criticism of the measures was that the operation of the scheme for small producers led to a change in the production structure and an increase in the number of small farms.

A4.5 1995 – 2000

The regime was further revised in June 1995[4]. On the basis of the EU's internal demand for cotton fibre and taking account of the areas judged suitable for production, the MGQ was increased. At the same time, to ensure budget neutrality, the guide and minimum prices were reduced.

The MGQ was increased to 1 031 000 tonnes and, to ensure fairness between member states, a National Guaranteed Quantity (NGQ) was introduced for each producing country. If national production exceeded the NGQ then the aid was reduced proportionately in the country

---

3 Council Regulation (EEC) No 2052/92.

4 Council Regulations (EC) No 1553/95 and (EC) No 1554/95.

responsible for the excess. The NGQ was set at 782 000 tonnes for Greece and 249 000 tonnes for Spain. Other countries with cotton potential were permitted a quota of 1 500 tonnes.

Under the stabiliser mechanism, the price fell by 0.5% for every 1% by which actual production exceeded the NGQ. However, aid to the sector was required to be at least €770 million in magnitude. In the event of high international prices, when the level of aid per tonne was reduced, the reductions in guide price were moderated to ensure that the minimum level of budgetary expenditure was reached.

The guide price was set at €1 063.0 per tonne of unginned cotton and the minimum price at €1 009.9 per tonne. The required quality standards were that the cotton was:

- of fair sound and merchantable quality;
- having 10% moisture and a 3% impurity content;
- having the necessary characteristics to produce, after ginning, 32% grade 5 fibres (white middling) of 28 mm length (1-3/32 inches).

The world market price for unginned cotton was determined by the Commission on the basis of the historical relationship between the world market price for ginned cotton and the calculated price for unginned cotton, rather than an estimate of production costs.

The world market price was based on the above quality standards, and an average of offers and quotes made at one or more European exchanges for a product delivered c.i.f. Northern Europe. The Cotlook "A" cotton price acted as a proxy for this price.

Under the revised scheme, the cut-off and carry over system was abolished. Aid was received when the cotton was ginned, but advance payments could be made when the unginned cotton entered the ginner's undertaking, subject to the provision of adequate security by the ginner. The advance could not exceed 40% of the guide price. The balance was paid on ginning and before the end of the marketing year.

The scheme for small producers (Regulation (EEC) No 1152/90) was repealed.

Over the period production continued to be, on average, above the NGQ in both Spain and Greece and in 1999/2000, with low prices, budget expenditure rose to record levels. Portugal began cotton farming in 1997/98 and all its unginned cotton was processed by Spanish ginners.

A4.6 2001 – 2005

A sixth amendment of the scheme was introduced in May 2001[5]. The regulation sought to simplify the system as the legislative arrangements where considered too complex. Consequently, paragraph 11 of Protocol 4 was repealed and replaced by an enabling provision (now paragraph 6 of Protocol 4). The paragraph stated that 'the Council, acting by a qualified majority on a proposal from the Commission and after consulting the European Parliament, shall decide on the adjustments necessary to the system introduced pursuant to this Protocol and shall adopt the general rules necessary for implementing the provisions of this Protocol'.

[5] Council Regulation (EC) No 1050/2001.

At the same time, and on the basis of the new paragraph 6, Council Regulation (EC) No 1051/2001 was adopted. Under the regulation:

1. The guide price and minimum prices were maintained at their previous levels. The NGQ was maintained at 782 000 tonnes for Greece and 249 000 tonnes for Spain and 1 500 tonnes for other member states. However, further penalties were introduced if total Community production rose above 1 500 000 tonnes (Table A4.1).

Table A4.1: Revised NGQ and Enforced Penalties, 2001 – 2005

	NGQ '000 tonnes	1st penalty	Second NGQ '000 tonnes	2nd penalty
Greece	782	Guide price reduction of 50% of the % rate of overshoot	1.138	Additional 2% penalty on the guide price reduction for each 15 170 tonnes above the second NGQ
Spain	249	Guide price reduction of 50% of the % rate of overshoot	362	Additional 2% penalty on the guide price reduction for each 4 830 tonnes above the second NGQ

Source: DG AGRI.

The level of aid to the sector was still required to be at least €770 million and, in the case of high international prices when the level of aid per tonne was lower, the reductions in fixed prices were moderated to ensure the minimum level of expenditure.

2. The means for calculating the market price for unginned cotton was set out in a formula. The price was recalculated three times each month.

3. The rules for advance payment were revised so that an advance could be made, subject to the necessary securities being in place, when unginned cotton entered the ginners' "supervised storage" system. The advance could then be made for the full value of the aid.

4. Under the revised scheme, for the first time, member states were required to consider environmental issues in the granting of the aid. The Member States were required to:

   - determine measures to improve the environment, paying particular attention to cultivation techniques; and
   - develop research programmes into more environmentally friendly grower measures and inform growers of the results of such research.

In addition, MS could restrict the areas eligible for production aid on the basis of objective criteria relating to:

- the agricultural economy where cotton was the major crop;
- the soil and climatic conditions in the region concerned;
- the management of irrigation water and rotation systems and cultivation methods likely

to improve the environment.

In Spain, this meant that from 2002/03 a system of compulsory crop rotation was introduced at farm level, while in Greece a national decree limiting the production area eligible for aid was introduced. This eligible area was set at 393 700 hectares (a 5% reduction on the average area in previous years).

A4.7 The basic principles of the new regime

In 2003, the Mid-Term review of the Agenda 2000 reform, provided a far-reaching general reform of the CAP. The guiding principle was a move away from price and production support for specific crops to one of direct support for farmers' incomes. Regulation (EC) No 1782/2003 implemented the CAP reform and, from October 2003, subject to transition arrangements that were determined by individual Member States, most aid to farmers under the CAP became 'decoupled': that is, farmers receive a single farm payment not linked to the production of a specific crop.

To bring the support schemes for cotton, olive oil, tobacco and hops into line with those of other sectors of the Common Agricultural Policy, the Council adopted Regulation (EC) No 864/2004. For these crops however, a proportion of the aid remained coupled[6] (i.e., linked to production of the crop). For cotton, the justification for this coupled payment was that the adoption of a completely integrated single farm payment scheme would bring significant risk of production disruption to cotton producing regions. Consequently the decoupled single area payment was set at 65% of the national share of aid available to producers and the remaining 35% remained coupled to cotton but calculated on the basis of a per hectare payment. Regulation (EC) No 864/2004 inserted in Title IV of Regulation (EC) No 1782/2003 a special Chapter 10a: "Crop specific payment for Cotton".

A4.8 Decoupled Aid

The decoupled aid is paid to producers irrespective of their planting decisions. The number of hectares for which the payment is made is dependent on the level of production during the reference period 2001 to 2003.

The amount of decoupled aid differed by member state, and was set at:

- Greece: €966 per hectare,
- Spain: €1 509 per hectare,
- Portugal: €1 202 per hectare.

Coupled Aid

The coupled aid is payable on the opening of the bolls, rather than on harvest and all payments are made directly to the farmers and not, as before, via the ginners.

Under Regulation (EC) No 864/2004, for environmental reasons, base areas were established in order to limit the areas under cotton. These base areas determined the coupled aid, and were set at 370 000 hectares for Greece, 70 000 hectares for Spain and 360 hectares for Portugal.

---

[6] In the case of hops, the decision to allow coupled aid was at the discretion of the individual Member State.

The amount of coupled aid per eligible hectare was set at:

- Greece: €594.0 per hectare for 300 000 hectares and €342.8 per hectare for the remaining 70 000 hectares,
- Spain: €1 039 per hectare,
- Portugal: €556 per hectare.

Under Article 69 of Regulation (EC) No 1782/2003, a country could deduct up to 10% of the decoupled area payment and redistribute it as a coupled payment subject to specific quality norms. This option was selected by the Spain government. The decoupled payment in Spain was reduced to €1 358 per hectare and a supplementary payment of €191 per hectare was made if the cotton area contained cotton fibre with maximum impurity of 5%, maximum humidity of 12% and yield higher than a local minimum.

Inter-branch organisations

The reform also provided funds (€4 million of payments) to create inter-branch organisations. These organisations were to be established between growers and at least one ginner with a view to improving the quality of cotton delivered to the ginner. The inter-branch organisations could establish rules on certain aspects of the contracts between ginners and growers and have the power to differentiate the level of crop-specific aid for their members according to the quality of cotton produced.

ANNEX 5 – THE EU COTTON SECTOR

A5.1. The international context

The EU cotton sector represents for only about 2% of the world cotton production, which for the 2006/2007 crop year was estimated at 24.86 million tonnes. The main three international players — China, USA and India — supply over 60% of the world cotton fibre. The C4 group of African countries[7] represents about 4% of the world production. The expiration of the Multi-Fibre Agreement (MFA) in 2003 induced a considerable expansion of Asian textile industry and exports. Meanwhile, the decline of the EU textile industry squeezed the domestic sales of ginners in Greece and Spain which were so increasingly obliged to look for market outlets outside the Community. Over the last five years, exports accounted for 72% of production in Greece and 45% of production in Spain. Greek exports are dominated by exports to Turkey and North Africa. In Spain, exports to the EU-15 were the most important until 2006 (Table A5.1).

Table A5.1: EU Cotton exports (tonnes, ginned cotton)

Greece	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Intra EU-15	86 599	116 235	47 457	58 869	43 800	39 400	45 629
Extra EU-15	203 353	210 100	179 018	225 354	243 639	192 960	286 762
Turkey	134 286	130 444	109 511	99 786	129 161	90 725	164 263
North Africa	17 664	12 571	11 345	18 388	47 473	47 070	55 895
Central Europe	32 003	33 458	27 751	26 741	23 508	14 700	23 111
Other	19 402	33 627	30 412	80 440	43 496	40 466	43 493
Total	**289 952**	**326 335**	**226 474**	**284 224**	**287 439**	**232 361**	**332 391**

Spain	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Intra EU-15	23 244	20 770	12 830	16 988	35 203	30 970	30 450
Extra EU-15	14 412	15 467	9 131	12 675	32 228	23 913	42 501
North Africa	10 238	11 019	8 291	5 603	12 085	8 691	16 168
ASEAN	1 972	509	348	119	1 279	1 572	8 605
Other	2 201	3 939	492	6 953	18 864	13 650	17 729
Total	**37 656**	**36 237**	**21 961**	**29 662**	**67 431**	**54 883**	**72 952**

Source: Eurostat.

The EU cotton market is not protected by tariff and cotton can be imported from and exported to the world market freely at the world market price. Despite that and its tiny world market share, the EU support system has been seriously criticised during the **Doha Development Agenda**. In fact, although the EU sector does not significantly affect the international trade, the nature of the support attracts criticism, as for the US, from less developed producing countries. In Cancun 2003, a group of African countries called for the elimination of subsidies and compensation for the damages caused to them by subsidies granted to cotton in richer

[7] Benin, Burkina Faso, Chad and Mali.

countries. It followed the 2005 Hong Kong Declaration which set up a Sub-Committee on Cotton with the purpose to prioritise the reduction of trade-distorting subsidies to cotton. Moreover, the panel on cotton US subsidies launched by Brazil make the cotton policy a very sensitive issue.

Blue box support is a support under production limiting programmes that is exempted from the general reduction commitment for trade distorting agricultural support if the support given is in conformity with Art. 6(5) of the Agreement on Agriculture. This means that support should be production-limiting and the payments must be made on the basis of a fixed area and yield. Art. 6(5) does not establish any link between the Blue Box payment and the specific production conditions. Coupled payments can therefore be categorised as blue box, regardless of the obligation to either harvest the crop or to keep the cotton on the field until boll opening.

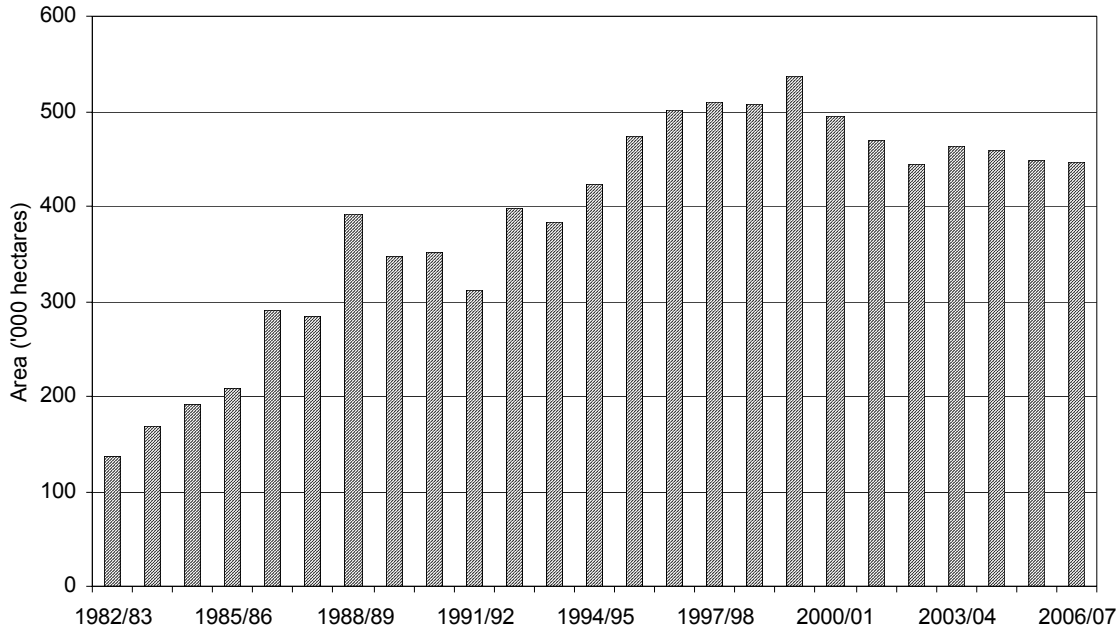
A5.2 Overview of Cotton Production

Total Cotton Area and Production

Cotton is produced in four EU-27 states, namely Greece, Spain, Portugal[8] and Bulgaria. Production is dominated by Greece and Spain. Production in Portugal and Bulgaria was just 1 285 tonnes and 611 tonnes in 2005, respectively. Production ceased in Portugal in 2006 following the reform of the cotton regime. In the following sections, we focus on trends in Spain and Greece, the largest producers.

The EU-15 cotton area grew steadily until the end of the 1990s, peaking at almost 540 000 hectares in 1999/2000. Since then the area under cotton has stabilised at 450 000 hectares (Diagram A5.1).

Diagram A5.1: EU Cotton area



Source: DG AGRI, National Authorities, LMC (Note: Spanish data are only included from 1986/87 with its accession to the EU).

[8] With only small volumes produced in Portugal, unginned cotton was transported to Spain for ginning.

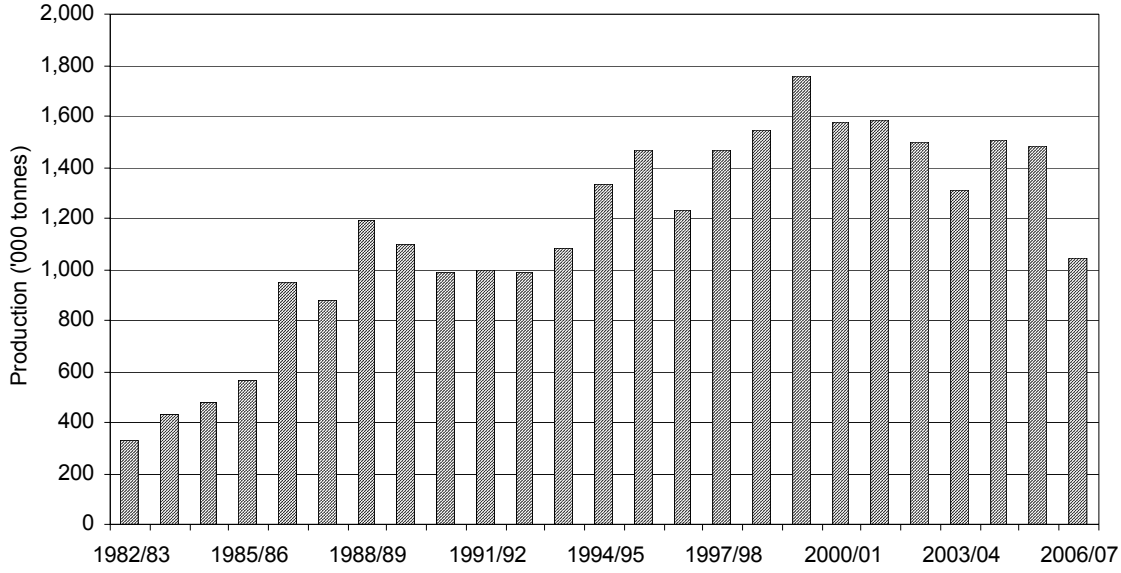
In Greece the cotton area peaked in 1995/96 at 441 000 hectares. The area then fell to approximately 360 000 hectares, but rose to 383 000 hectares in 2006/07. In Spain, the picture has been more erratic: the area peaked in 1988 at 135 000 hectares and then declined dramatically in 1993/94 through to 1995/96 owing to drought. The area under cotton then revived, peaking at 114 000 hectares in 1997/98. The area under cotton fell to 63 000 hectares in 2006/07 (Diagram A5.2).

Diagram A5.2: EU-15 Harvested cotton area by country

Source: LMC (Note: Data for Spain cover only the period since accession to the EU).

With a growing area and rising yields, EU cotton production peaked in 1999/2000 at 1.76 million tonnes of unginned cotton (see Table A5.1a). In 2006/07, total output fell to its lowest level since the 1980s. This was due to a combination of impact of regime change (in Spain) and poor weather in Greece (Diagram A5.3).

Diagram A5.3: EU-15 Unginned cotton production



Source: LMC (Note: Data for Spain cover only the period since accession to the EU)

Table A5.1a: EU eligible production of unginned cotton

	Greece	Spain	Italy	Portugal	TOTAL
1981/82					
1982/83	333 162				333 162
1983/84	428 453				428 453
1984/85	481 246				481 246
1985/86	561 540				561 540
1986/87	667 779	284 550			952 329
1987/88	600 448	275 070			875 518
1988/89	805 856	383 169	99		1 189 124
1989/90	886 919	211 599	29		1 098 547
1990/91	709 871	281 838	34		991 743
1991/92	719 449	279 575			999 024
1992/93(*)	760 685	223 932			984 617
1993/94	985 676	98 883			1 084 559
1994/95	1 191 400	143 249			1 334 649
1995/96	1 364 798	104 400		1	1 469 199
1996/97	927 650	300 221		0	1 227 871
1997/98	1 085 482	379 358		102	1 464 942
1998/99	1 210 900	337 567		147	1 548 614
1999/2000	1 350 677	409 518		73	1 760 268
2000/2001	1 272 873	300 657		0	1 573 530
2001/2002	1 237 103	336 984		612	1 574 699
2002/2003	1 166 268	321 540		843	1 488 651
2003/2004	1 006 248	306 025		632	1 312 905
2004/2005	1 135 534	368 084		982	1 504 600
2005/2006	1 122 445	355 348		440	1 478 233

(*) adaptation of the quality standard of unginned cotton.
Source: DG AGRI

The cotton sector in Greece

Greek production is dominated by four NUTS2 regions (Central Macedonia, East Macedonia, Thessalia and Sterea Ellada). These areas account for 96% of the total cotton area (Table A5.2).

Table A5.2: Greek cotton area by NUTS 2 Region (hectares)

	2004/05	2005/06
Anatoliki Makedonia	54.7	53.6
Kentriki Makedonia	97.0	95.1
Dytiki Makedonia	0.0	1.0
Thessalia	150.7	147.6
Ipeiros	466.0	455.0
Dytiki Ellada	8.1	7.6
Sterea Ellada	54.0	53.1
Peloponnisos	1.0	1.0
Attiki	711.0	684.0
	365.6	**358.1**

Source: Ministry of Agriculture.

Cotton accounts for 9.1% of final Greek agricultural output. A breakdown of the importance of production by region is not available.

There are 79 700 farmers involved in cotton farming in Greece; these are concentrated in Anatoliki Makedonia, Kentriki Makedonia, Thessalia and Sterea Ellada.

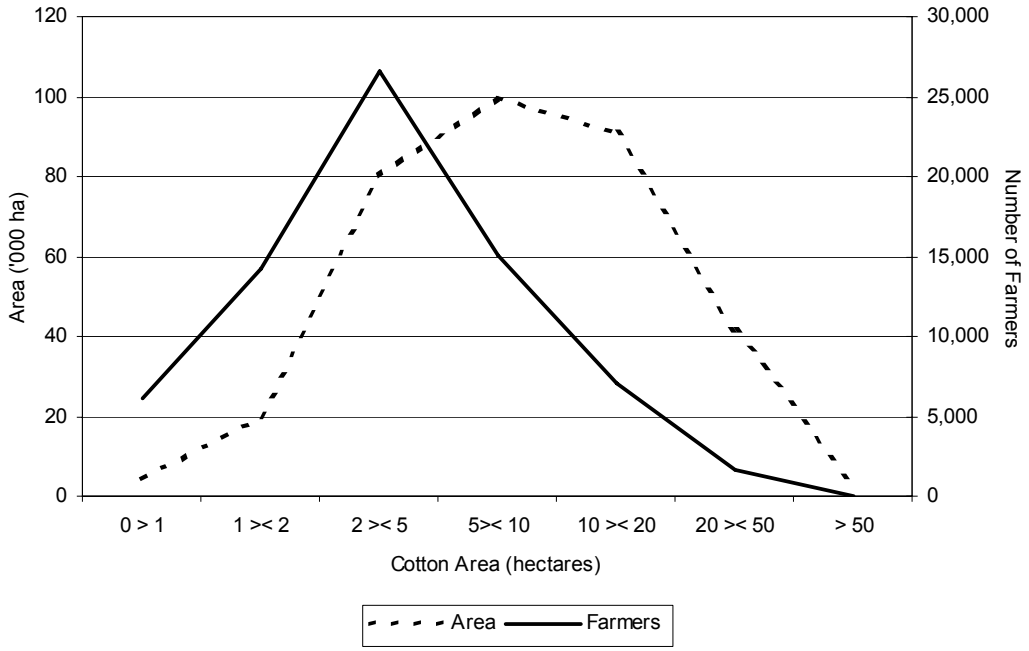
The majority of farmers grow between 2 and 5 hectares of cotton. The average cotton area across all farms was 4.5 hectares in 2005 (Diagram A5.4). FADN data give an indication of the importance of cotton to the total farm area. In 20% of cases in Makedonia, cotton accounted for over 75% of the farm area, while in Thessalia in 36% of cases cotton accounted for over 75% of the total farm area (Table A5.3).

Table A5.3: The importance of cotton to total farm area (number of observations)

Area under cotton (%)	1998	1999	2000	2001	2002	2003	2004	Average
Makedonia-Thraki								
>25%	207	171	189	182	199	170	186	29%
25%–49%	242	219	216	201	184	196	187	31%
50%–74%	176	159	178	143	114	104	116	21%
75%–99%	82	86	73	69	65	64	62	11%
100%	64	73	54	56	50	54	45	8%
Ipiros-Peloponi / Thessalia / Sterea Ellas								
>25%	37	46	43	43	42	36	36	10%
25%–49%	115	98	105	95	79	93	77	21%
50%–74%	128	116	158	144	134	125	121	33%
75%–99%	159	110	115	108	90	103	92	24%
100%	57	53	50	45	54	49	57	12%

Source: FADN.

Diagram A5.4: Harvested cotton area by farm size in Greece, 2005



In terms of other crops grown on cotton farms, cereals, particularly durum wheat and maize, dominate. Sugar beet is also important.

Over 99% of Greek cotton production is grown under irrigated conditions (Table A5.4). The most important type is sprinkle (around 40% of total area), followed by drip (a little more than 30%). The rest (around 30%) is gravity. The share of drip irrigation has been growing in recent years. No cotton is grown under plastic.

Table A5.4: Cotton area in Greece by irrigation type ('000 hectares)

	2001	**2002**	**2003**	**2004**	**2005**
Irrigated	389	377	373	361	355
Non-irrigated	15	10	5	4	4
Total	**404**	**388**	**378**	**366**	**358**

Source: Ministry of Agriculture.

The cotton sector in Spain

Spanish cotton production is dominated by Andalusia, which accounts for 98% of its national production. Within Andalusia, the cotton area and production are dominated by Sevilla; Cadiz and Cordoba are also important (Table A5.5).

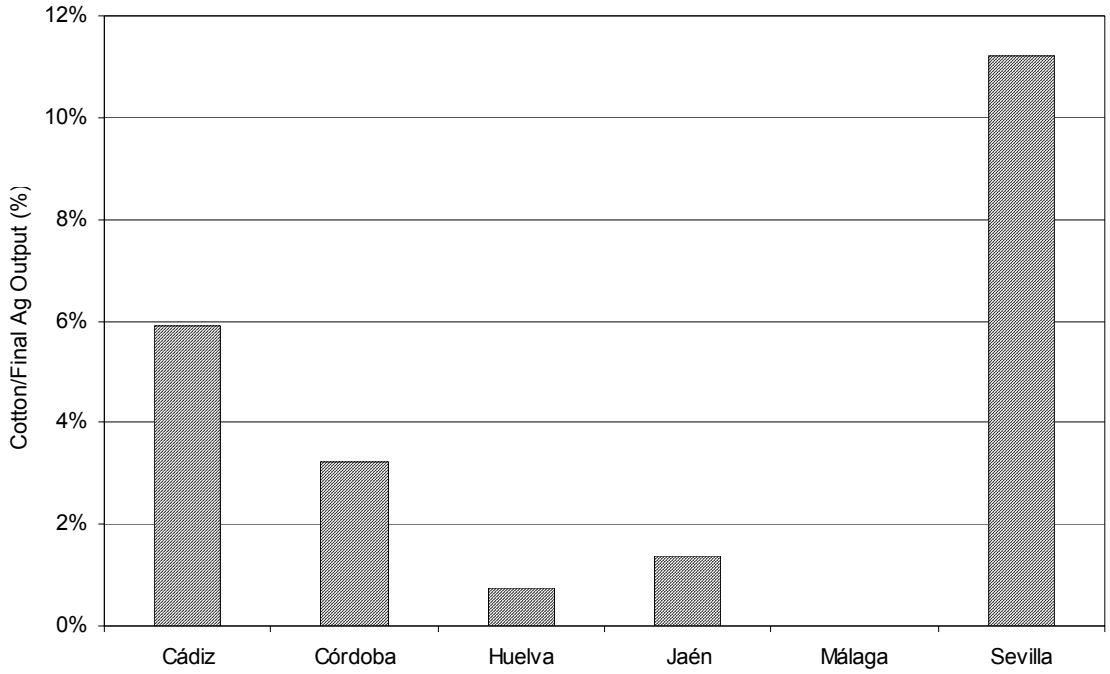
Table A5.5: Spanish cotton area by NUTS 3 Region (hectares)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Cádiz	8.9	12.9	13.9	15.1	15.7	16.0	12.6	15.7	13.7	14.5
Córdoba	8.7	14.9	11.2	13.2	9.6	10.1	10.3	11.8	12.6	11.8
Huelva	720.0	728.0	846.0	1.1	944.0	1.1	1.0	1.2	1.2	1.1
Jaén	7.1	9.1	5.9	6.5	6.7	6.8	6.2	7.0	7.5	7.0
Málaga	210.0	165.0	107.0	80.0	167.0	63.0	47.0	49.0	48.0	33.0
Sevilla	48.2	70.3	63.6	69.9	56.4	54.9	53.7	57.0	52.9	51.7
Murcia	2.9	3.3	2.9	2.5	2.1	2.5	2.4	1.9	1.7	1.9
Total	**76.8**	**111.3**	**98.5**	**108.4**	**91.6**	**91.5**	**86.4**	**94.7**	**89.5**	**88.1**

Source: Data on the province of Andalusia (Cádiz, Córdoba, Huelva, Jaén, Málaga and Sevilla): Boletín de Información Agraria y Pesquera. Consejería de Agricultura y Pesca. Junta de Andalucía;
Data on the province of Murcia: Spanish Ministry of Agriculture and Fishery (MAPA).

Cotton accounts for 1.3% of final Spanish agricultural output, but it is particularly important in Sevilla (11.2%), Cadiz (5.9%) and Cordoba (3.2%) (Diagram A5.5).

Diagram A5.5: Cotton as % of Total Agricultural Output Value in Andalusia, Spain, 2003 to 2005

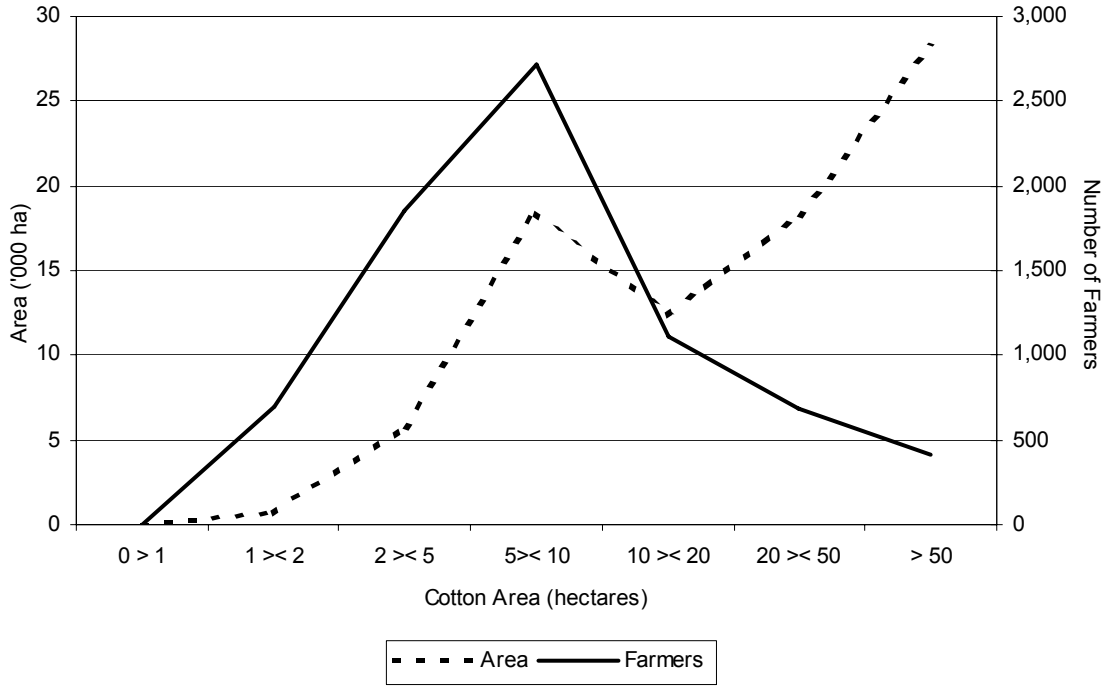


There are 9 500 farmers involved in cotton farming in Andalusia; they are concentrated in Sevilla, Cadiz and Cordoba.

The majority of farmers grow less than 10 hectares of cotton, although the inclusion of the cotton area grown on bigger farms brings the average cotton area across all farms to close to 10 hectares (Diagram A5.6). For many of these farms, cotton is just one of the crops grown. On average, cotton accounts for 50% of the farm area on cotton growing holdings in Jaen, 28% in Sevilla and 24% in Cordoba.

Of the total number of farms, 38% grow solely cotton; they account for 25% of the total cotton area. Wheat, maize, sunflower and sugar beet are the other main crops that are also grown by farmers who cultivate cotton (Table A5.6).

Diagram A5.6: Harvested cotton area by farm size in Spain



Source: LMC.

Table A5.6: Crop specialisation in Andalusia

By farm	2000/01	2001/02	2002/03	2003/04	Average
Only cotton	3 159	3 083	3 027	3 619	3 222
Cotton and tree crops	174	155	247	299	219
Cotton and rainfed wheat and sunflower	1 136	1 214	1 245	1 355	1 238
Cotton and maize	364	1 102	1 359	1 382	1 052
Cotton and irrigated wheat and sunflower	1 316	718	802	794	908
Cotton and vegetables	219	253	296	366	284
Cotton and sugar beet	1 416	1 139	1 236	1 198	1 247
Cotton and other arable crops	311	241	399	405	339

By area (ha)					
Only cotton	26 095	23 980	16 144	20 784	21 751
Cotton and tree crops	4 071	3 801	4 312	4 248	4 108
Cotton and rainfed wheat and sunflower	14 604	15 895	15 340	16 649	15 622
Cotton and maize	3 482	14 192	16 729	18 065	13 117
Cotton and irrigated wheat and sunflower	20 996	13 881	12 978	12 037	14 973
Cotton and vegetables	3 116	3 066	2 972	3 644	3 200
Cotton and sugar beet	12 416	11 210	11 233	11 396	11 564
Cotton and other arable crops	2 999	2 907	4 711	5 632	4 062

Source: Diagnóstico del sector Algodonero Andaluz. 2005. Consejería de Agricultura y Pesca. Junta de Andalucía.

Around 96% of production is grown under irrigated conditions in Andalusia. In Murcia, all the cotton area is irrigated. Gravity irrigation is the most popular system (Table A5.7). Between 2000/01 and 2003/04, 64% of the cotton was grown under plastic. However, in 2006 with the increased use of agri-environmental measures and a move to a less intensive production system, the area under plastic fell to zero.

Table A5.7: Cotton areas in Andalusia by irrigation type (hectares)

	2000/01	2001/02	2002/03	2003/04
Irrigated / rainfed				
Rainfed	3.5	3.9	2.3	3.9
Irrigated	84.3	85.0	82.1	88.6
Type of water application				
Rainfed	3.5	3.9	2.3	3.9
Sprinkle	19.1	17.8	15.4	15.0
Drip	21.3	22.1	21.8	26.6
Gravity	43.9	45.1	44.9	47.0
Total	**87.8**	**88.9**	**84.4**	**92.5**

Source: LMC.

The cotton sector in Portugal

Table A5.8: Ginned cotton in Portugal

	2001/02	2002/03	2003/04	2004/05	2005/06
Surface (ha)	216	497	373	273	194
Production (t)	200	281	211	326	152
Yield (t/ha)	0.926	0.565	0.566	1.194	0.784
Imports (t)	119 000	105 000	85 000	72 000	63 000
Exports (t)	0	0	0	0	0
Consumption (t)	125 000	115 000	85 000	70 000	63 000
Begin Stks (t)	34 000	28 000	18 000	18 000	21 000
End Stks (t)	28 000	18 000	18 000	21 000	21 000

Source: DG AGRI.

During the last marketing years the cotton area in **Portugal** was between 194 and 497 ha. Regarding the production of ginned cotton it fluctuated between 152 and 326 tonnes. While the local production is very limited the textile industry has important needs: 125 000 tonnes in 2001/2002. The consumption decreased significantly during the last years to 63 000 tonnes in 2005/2006. To meet its needs Portugal imports important quantities of cotton: 119 000 tonnes in 2001/2002 and 63 000 tonnes in 2005/2006. In 2006 the area for which the aid has been claimed (according to Article 3(1)(a) of Regulation (EC) No 1973/2004) fell to zero.

The cotton sector in Bulgaria

According to ICAC the area cultivated with cotton in Bulgaria between 2001/2002 and 2005/2006 stabilised at around 9 000ha with a production of 2 000 tonnes of ginned cotton. As the annual consumption was estimated around 1 800-2 000 tonnes for the same period, Bulgaria had to import between 17 000-20 000 tonnes of ginned cotton.

For 2006 the cotton area was significantly reduced to 2 000 ha (USDA). Also the imports fell considerably to 11 000 tonnes of ginned cotton in order to cover the needs of the industry.

Nota bene, for Bulgaria, although support for cotton is included in the SAPS regime currently applied, Article 110a of Regulation (EC) No 1782/2003 provides for a base area and amount for the crop-specific payment for Bulgaria.

Table A5.9: Ginned cotton in Bulgaria

	2001/02	2002/03	2003/04	2004/05	2005/06
Surface (ha)	9 000	9 000	9 000	9 000	9 000
Production (t)	2 000	2 000	2 000	2 000	2 000
Yield (t/ha)	0.222	0.254	0.254	0.257	0.257
Imports (t)	20 000	19 000	18 000	17 000	17 000
Exports (t)	1 000	1 000	1 000	1 000	1 000
Consumption (t)	20 000	20 000	19 000	19 000	18 000
Begin Stks (t)	8 000	9 000	9 000	9 000	9 000
End Stks (t)	9 000	9 000	9 000	9 000	9 000

Source: ICAC.

A5.3 Labour

The FADN data[9] suggest that the importance of family/unpaid labour for cotton production declines as the farm size increases. In Greece, the number of unpaid labour hours worked per hectare falls from 287 to 150 as the size of the farm increases in Makedonia-Thraki and from

[9] The estimates of family labour time are based on FADN data, which is a source that provides data across countries and crops. However, there are concerns regarding the reliability of these data. This arises from the nature of family labour; for instance, if a farmer's sole employment is in farming, the full year's labour time will be allocated to it, while in reality only a proportion of labour time is actually be spent on agricultural tasks. Accordingly, the FADN estimates are likely to overestimate the amount of time spent on a particular crop and conversely underestimate the return to labour. In addition, there appear to be inconsistencies between the bases on which estimates were prepared of labour use for the same crops in different Member States.

362 to 81 in Thessalia/Sterea Ellas (Table A5.8). In Spain, the number of labour hours worked per hectare falls from 183 to 69 as the size of the farm increases (Table A5.10).

Table A5.8: Greece, Unpaid labour hours (hours per hectare)

	2000	2001	2002	2003	2004	Average
Makedonia-Thraki						
> 5 ha	293	292	308	282	259	287
5–10 ha	226	215	219	211	193	213
10–20 ha	163	134	160	105	156	144
< 20 ha	236	70	200	121	122	150
Ipiros-Peloponi/Thessalia/Sterea Ellas						
> 5 ha	354	354	399	332	371	362
5–10 ha	197	196	208	210	209	204
10–20 ha	135	142	150	121	158	141
< 20 ha	79	80	62	95	87	81

Source: FADN

Table A5.9: Greece, Labour hours spent on cotton production, 2005-06 (hours per hectare)

Farm Size	Labour	2005	2006	Change
< 5 ha	Household	89.55	90.94	2%
	Paid	39.89	32.23	–19%
	Contracted	25.08	28.57	14%
	Total	**154.52**	**151.74**	**–2%**
5–10 ha	Household	79.13	87.62	11%
	Paid	32.61	29.86	–8%
	Contracted	6.39	5.86	–8%
	Total	**118.13**	**123.34**	**4%**
10–20 ha	Household	82.17	76.77	–7%
	Paid	22.41	27.23	22%
	Contracted	30.35	25.80	–15%
	Total	**134.93**	**129.80**	**–4%**
> 20 ha	Household	80.78	73.03	–10%
	Paid	28.64	28.74	0%
	Contracted	29.19	27.08	–7%
	Total	**138.61**	**128.85**	**–7%**

Source: LMC.

Table A5.9: Greece, Labour hours spent on cotton production, 2005-06 (hours per hectare)

	2000	2001	2002	2003	2004	Average
< 10 ha	166	125	151	238	236	183
10–20 ha	94	83	102	162	151	119
> 20 ha	61	61	73	81	71	69

Source: FADN.

The falling of labour time with the farm size is confirmed also by the questionnaire, although the hours worked per hectare are found to be less than in the FADN sample across all size categories (Table A5.11). In general, data from the questionnaires suggest that the number of unpaid labour hours is more constant over farm sizes than was the case with the FADN data, varying between 75 and 90 hours per hectare. It is noteworthy that the number of hours is found to be considerably less than those reported by FADN. According to the responses to the LMC's questionnaire, cotton is the most important user of family labour in all size categories. This has not changed much over the last five years.

Table A5.11: Spain, labour hours spent on cotton production, 2005-06 (hours per hectare)

Farm Size	Labour	2005	2006	Change
< 10 ha	Household	58.7	58.1	–1%
	Paid	0.3	–	–
	Contracted	8.1	5.7	–30%
10–20 ha	Household	57.2	55.2	–3%
	Paid	–	3.0	–
	Contracted	9.8	9.1	–7%
> 20 ha	Household	23.1	24.6	6%
	Paid	12.5	9.3	–26%
	Contracted	4.4	3.4	–23%

Source: LMC.

ANNEX 6 – COSTS OF PRODUCTION AND GROSS MARGIN

A6.1 Production costs prior to the regime change

On the basis of data of farm producing only cotton, the structure of the production costs for this crop can easily be observed. It emerges a quite different picture of the farming costs in Greece and Spain.

In **Greece**, the structure of the costs in the regions concerned is quite similar. It strikes a relatively high proportion of fixed costs per hectare of the total production costs —above 40%. Depreciation and rent are the major reported component of the fixed costs. In Makedonia-Thraki, costs are higher in the smallest farm and the absolute value and the proportion of fixed costs tend to decrease quite regularly with the increase of the farmed area's size, regardless whether family labour is included or excluded. No trend is instead clear in Thessalia (Tables A6.1 and A6.2).

Table A6.1: Average production costs for 100% cotton farms, Makedonia-Thraki (€/hectare)

	2000	2001	2002	2003	2004
Seed	130.9	135.0	106.5	118.1	122.2
Fertiliser	167.6	163.9	148.9	143.6	154.5
Crop protection	196.6	195.8	180.4	207.6	212.0
Other specific costs	24.1	19.0	27.9	33.5	29.0
Energy and fuel	177.7	182.7	171.1	176.6	182.6
Contracted labour/services	293.8	272.0	273.9	262.8	263.4
Water/irrigation	95.6	106.9	107.9	102.9	108.3
Other direct costs	12.8	14.3	9.4	12.1	13.2
Labour (paid)	38.6	42.9	47.8	62.7	83.4
Total variable costs	**1 137.8**	**1 132.5**	**1 073.9**	**1 119.8**	**1 168.6**
Machinery	52.3	55.2	48.3	50.6	56.3
Depreciation	443.0	469.5	537.8	517.2	572.0
Rent	191.6	215.6	276.1	281.2	273.6
Interest	11.2	7.9	10.9	11.0	12.0
Total fixed costs	**698.1**	**748.2**	**873.1**	**860.1**	**913.9**
Total costs	**1 835.9**	**1 880.7**	**1 947.0**	**1 980.0**	**2 082.5**
Total unpaid labour (hrs)	244.3	229.8	239.5	209.1	194.6
Average hourly wage	2.2	2.4	2.6	2.7	3.0
Total unpaid labour	543.9	550.9	611.7	569.3	593.0
Total cost including unpaid labour					
Variable cost	1 627.3	1 628.3	1 624.4	1 632.2	1 702.3
Fixed cost	752.5	803.3	934.3	917.1	973.2
Total cost	2 379.8	2 431.6	2 558.6	2 549.3	2 675.5

Note: 1. To derive costs including family labour we have valued family labour at the paid labour rate.
2. In deriving total costs it is assumed that 90% of unpaid labour is attributed to variable costs and 10% to fixed costs.

Source: FADN, LMC

Table A6.2: Average cotton production costs for 100% cotton farms, Thessalia/Sterea Ellas
(€/hectare)

	2000	2001	2002	2003	2004	Average
Seed	142.0	152.7	155.4	162.5	201.7	162.9
Fertiliser	144.5	146.0	160.4	149.5	163.9	152.9
Crop protection	90.8	88.7	106.6	116.2	132.8	107.0
Other specific costs	20.4	16.7	17.0	9.2	11.8	15.0
Energy and fuel	199.3	197.4	223.1	249.6	279.8	229.8
Contracted labour/services	269.5	283.4	264.9	244.0	247.5	261.9
Water/irrigation	26.4	24.5	38.5	41.8	48.4	35.9
Other direct costs	13.3	12.3	20.1	33.9	17.8	19.5
Labour (paid)	31.0	23.7	30.2	35.7	30.3	30.2
Total variable costs	**937.3**	**945.3**	**1 016.1**	**1 042.4**	**1 134.1**	**1 015.0**
Machinery	39.3	44.6	45.8	43.7	37.6	42.2
Depreciation	370.3	349.3	389.0	384.0	339.0	366.3
Rent	205.7	229.6	254.2	275.2	253.5	243.6
Interest	57.7	18.6	18.1	15.6	8.4	23.7
Total fixed costs	**673.1**	**642.1**	**707.1**	**718.6**	**638.6**	**675.9**
Total costs	**1 610.4**	**1 587.4**	**1 723.2**	**1 761.0**	**1 772.6**	**1 690.9**
Total unpaid labour (hrs)	231.3	239.6	248.2	210.0	220.3	229.9
Average hourly wage	2.2	2.4	2.6	3.0	3.1	2.7
Total unpaid labour	516.7	582.1	656.9	640.0	682.5	615.6
Total cost including unpaid labour						
Variable cost	1 402.3	1 469.2	1 607.4	1 618.4	1 748.3	1 569.1
Fixed cost	724.7	700.3	772.8	782.6	706.8	737.4
Total cost	2 127.1	2 169.5	2 380.1	2 400.9	2 455.2	2 306.6

Note: 1. To derive costs including family labour we have valued family labour at the paid labour rate.
2. In deriving total costs it is assumed that 90% of unpaid labour is attributed to variable costs and 10% to fixed costs.
Source: FADN, LMC

The components of the variable costs per hectare are rather stable over the years, with a prevalence of contracted labour and services, crop protection and fertiliser products, and energy and fuels. Water/irrigation is an important cost in Makedonia-Thraki and less relevant in Thessalia.

Labour is an important element of the production cost. Assuming as opportunity cost "the paid wage", unpaid labour alone makes up about one-fourth/one-fifth of the total production costs per hectare. If unpaid labour is not considered among the costs, contracted services represents about one-sixth of the total costs and about one-fifth of the variable costs. Taken together, contracted services, paid and unpaid labour represent about 35–40% of the total production cost of cotton.

Unlike in Greece, the cost structure of the **Spanish** farms producing only cotton is far less affected by depreciation. Fixed costs per hectare are much less important and tend to decrease over time in absolute and relative value. In 2004 they represented about 15% of the total production costs. Rent is the main element of the fixed cost, although strongly decreasing over 2000–2004. Among the variable costs, contracted labour/services is the major element. It is

followed by fertiliser and crop protection products, and water/irrigation. In the period considered, in absolute value, variable costs increased considerably while fixed costs decreased (Table A6.3).
With the extension of the farm size, the costs of inputs per hectare seem to decrease while the fixed costs move to the opposite direction. Total cost per hectare increase significantly with the size of the farm, when family labour is included, while it slightly decrease when family labour is excluded.

As for Greece, in Spain labour is an important element of the cost of cotton production. Contracted labour/services and paid labour weighted about one-third of the total variable costs (and one-fourth of the total costs). If unpaid labour wage is added, the spending for labour and services is about half of the total costs.

Table A6.3: Average production costs for 100% cotton farms, Spain, FADN (€/hectare)

	2000	2001	2002	2003	2004
Seed	119.9	206.7	202.1	120.6	130.3
Fertiliser	146.7	189.3	286.3	230.4	253.6
Crop protection	163.5	165.4	211.8	452.1	325.6
Other specific costs	54.5	61.4	62.0	72.6	71.9
Energy and fuel	138.2	116.6	92.5	59.0	78.7
Contracted labour/services	196.8	152.7	162.7	308.6	464.8
Water/irrigation	93.4	73.6	76.3	165.4	237.2
Other direct costs	27.4	46.2	46.5	55.6	94.2
Labour (paid)	85.2	94.7	113.6	96.3	76.6
Total variable costs	**1 025.6**	**1 106.6**	**1 253.8**	**1 560.6**	**1 732.8**
Machinery	46.5	54.2	66.4	44.5	58.8
Depreciation	261.1	121.9	87.1	75.7	61.8
Rent	180.3	255.5	323.7	199.7	188.2
Interest	25.7	20.4	15.8	9.1	5.1
Total fixed costs	**513.6**	**452.0**	**493.0**	**329.1**	**313.9**
Total costs	**1 539.2**	**1 558.7**	**1 746.8**	**1 889.7**	**2 046.7**
Total unpaid labour (hrs)	107.0	93.1	110.9	191.8	182.1
Average hourly wage	5.1	5.4	5.8	5.2	5.4
Total unpaid labour	542.3	504.9	647.4	994.6	990.5
Total cost including unpaid labour					
Variable cost	1 513.7	1 561.1	1 836.5	2 455.7	2 624.3
Fixed cost	567.8	502.5	557.7	428.5	412.9
Total cost	2 081.5	2 063.6	2 394.2	2 884.3	3 037.2

Note: 1. To derive costs including family labour we have valued family labour at the paid labour rate.
2. In deriving total costs it is assumed that 90% of unpaid labour is attributed to variable costs and 10% to fixed costs.
Source: FADN, LMC

A6.2 Comparison with other crops

In **Greece**, the costs of production per hectare of cotton are on average higher than the other main alternative crops (durum wheat, maize and for Spain sunflower). The structure of the production costs is closer to maize, with a more intensive use of fertilisers and crop protection products, water and contracted services. The use of services and paid labours is in general

more important for growing cotton than for maize. The unpaid labour is rather similar in Macedonia but far lower than that of maize in Thessaly (Tables A6.4 and A6.5).

Table A6.4: Average maize production costs, Thessalia/Sterea Ellas, FADN definition
(€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	132.2	143.4	131.5	135.3	124.7	127.4	141.5
Fertiliser	250.1	260.9	246.3	260.1	260.9	265.6	293.7
Crop protection	73.1	67.4	81.7	71.1	88.6	90.0	98.7
Other specific costs	45.9	37.1	53.4	38.9	34.5	35.3	37.7
Energy and fuel	101.9	66.5	85.7	117.6	130.7	133.6	142.6
Contracted labour/services	203.5	207.2	173.0	176.3	167.5	171.5	178.2
Water/irrigation	111.2	108.4	100.2	97.9	99.3	101.5	104.5
Other direct costs	10.6	11.1	9.4	7.5	12.4	12.7	13.5
Labour (paid)	6.7	9.3	22.8	24.3	35.3	36.1	38.6
Total variable costs	**935.3**	**911.3**	**904.1**	**929.0**	**953.9**	**973.7**	**1 049.1**
Machinery	41.3	36.5	33.1	23.0	32.5	32.5	32.5
Depreciation	208.4	176.8	243.0	250.8	306.8	306.8	306.8
Rent	112.8	76.2	226.9	214.3	184.3	184.3	184.3
Interest	13.7	4.5	0.0	1.8	1.9	1.9	1.9
Total fixed costs	**376.2**	**294.0**	**502.9**	**489.8**	**525.5**	**525.5**	**525.5**
Total costs	**1 311.5**	**1 205.4**	**1 407.1**	**1 418.7**	**1 479.5**	**1 479.5**	**1 479.5**
Total unpaid labour (hrs)	434.0	513.5	423.6	406.7	445.8	445.8	445.8
Average hourly wage	2.2	2.4	2.6	3.0	3.1	3.2	3.3
Total unpaid labour	969.2	1 247.4	1 121.3	1 239.3	1 381.3	1 430.5	1 480.8
Total cost including unpaid labour							
Variable cost	1 807.5	2 034.0	1 913.3	2 044.4	2 197.1	2 261.1	2 381.8
Fixed cost	473.2	418.8	615.1	613.7	663.7	668.6	673.6
Total cost	2 280.7	2 452.8	2 528.3	2 658.1	2 860.8	2 929.7	3 055.4

Source: 2003-2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

Table A6.5: Average maize production costs, Makedonia-Thraki, FADN definition (€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	146.9	121.4	149.6	154.8	151.0	153.1	157.9
Fertiliser	237.5	169.2	223.5	216.0	227.8	232.2	245.7
Crop protection	134.9	87.4	121.6	133.6	144.1	146.0	149.9
Other specific costs	12.0	10.6	26.8	40.0	32.3	32.8	34.0
Energy and fuel	144.8	133.9	157.0	194.1	165.6	167.8	174.1
Contracted labour/services	130.1	139.3	135.8	141.9	128.7	129.4	136.4
Water/irrigation	78.9	66.7	65.7	75.4	55.2	55.9	57.8
Other direct costs	9.1	10.5	12.5	6.0	8.2	8.4	8.7
Labour (paid)	18.1	3.6	44.2	10.1	46.4	47.0	48.8
Total variable costs	**912.4**	**742.6**	**936.8**	**971.9**	**959.4**	**972.6**	**1 013.3**
Machinery	41.4	31.7	26.3	38.6	47.6	47.6	47.6
Depreciation	349.3	307.2	424.6	392.7	342.8	342.8	342.8
Rent	212.0	193.7	190.0	173.5	142.3	142.3	142.3
Interest	20.6	28.2	12.5	2.5	1.5	1.5	1.5
Total fixed costs	**623.2**	**560.8**	**653.4**	**607.3**	**534.2**	**534.2**	**534.2**
Total costs	**1 535.7**	**1 303.4**	**1 590.1**	**1 579.2**	**1 493.6**	**1 493.6**	**1 493.6**
Total unpaid labour (hrs)	252.5	217.7	199.9	190.1	193.8	193.8	193.8
Average hourly wage	2.2	2.4	2.6	2.7	3.0	3.2	3.3
Total unpaid labour	562.3	522.0	510.6	517.6	590.6	622.0	643.9
Total cost including unpaid labour							
Variable cost	1 418.5	1 212.4	1 396.3	1 437.7	1 490.9	1 532.4	1 592.8
Fixed cost	679.5	613.0	704.4	659.1	593.3	596.4	598.6
Total cost	2 097.9	1 825.4	2 100.7	2 096.8	2 084.1	2 128.8	2 191.4

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

As for durum wheat, the input of contracted services and labour and unpaid labour is far less important, both in relative and particularly absolute terms. The main variable cost elements are, in order of priority, fertilisers, seed, services and energy (Tables A6.6 and A6.7).

Table A6.6: Average durum wheat production costs, Thessaly/Sterea Ellas, FADN definition
(€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	64.8	74.0	75.9	62.5	79.5	81.2	90.2
Fertiliser	114.8	105.2	126.9	106.8	123.1	125.4	138.6
Crop protection	28.9	33.0	54.2	40.4	41.2	41.9	46.0
Other specific costs	1.6	0.8	9.6	1.7	3.2	3.2	3.5
Energy and fuel	52.1	59.2	41.2	34.2	43.4	44.3	47.4
Contracted labour/services	58.6	71.5	52.7	57.6	70.2	71.9	74.7
Water/irrigation	1.8	1.1	2.1	0.2	0.7	0.8	0.8
Other direct costs	8.9	7.0	5.7	0.0	0.5	0.5	0.6
Labour (paid)	8.9	12.0	30.2	13.8	25.4	26.0	27.7
Total variable costs	**340.4**	**364.0**	**398.5**	**317.2**	**387.3**	**395.2**	**429.4**
Machinery	17.6	18.5	29.9	21.3	13.3	13.3	13.3
Depreciation	147.1	139.3	90.9	144.4	118.2	118.2	118.2
Rent	64.3	54.0	105.8	96.5	122.1	122.1	122.1
Interest	0.0	2.6	0.0	1.6	0.0	0.0	0.0
Total fixed costs	**228.9**	**214.4**	**226.7**	**263.7**	**253.5**	**253.5**	**253.5**
Total costs	**569.3**	**578.4**	**625.2**	**580.9**	**640.8**	**640.8**	**640.8**
Total unpaid labour (hrs)	123.1	129.0	89.6	92.4	97.9	97.9	97.9
Average hourly wage	2.2	2.4	2.6	3.0	3.1	3.2	3.3
Total unpaid labour	274.9	313.3	237.1	281.4	303.3	314.1	325.2
Total cost including unpaid labour							
Variable cost	587.9	646.0	611.9	570.5	660.3	677.9	722.0
Fixed cost	256.4	245.7	250.4	291.8	283.8	284.9	286.0
Total cost	844.3	891.7	862.3	862.3	944.1	962.8	1 008.0

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

Table A6.7: Average durum wheat production costs, Makedonia-Thraki, FADN definition
(€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	70.3	75.8	75.0	73.2	70.1	71.1	73.4
Fertiliser	98.8	97.3	93.3	96.6	102.3	104.3	110.3
Crop protection	41.4	43.5	38.0	40.8	48.0	48.7	49.9
Other specific costs	8.9	9.1	7.8	8.4	9.1	9.2	9.6
Energy and fuel	53.6	53.4	50.2	51.5	51.2	51.9	53.8
Contracted labour/services	74.7	70.4	75.7	57.5	55.5	55.8	58.8
Water/irrigation	2.8	2.1	1.5	1.8	2.2	2.3	2.4
Other direct costs	5.6	5.9	5.7	7.9	8.8	8.9	9.2
Labour (paid)	7.9	9.6	3.6	10.2	13.1	13.2	13.7
Total variable costs	**364.2**	**367.3**	**350.8**	**348.0**	**360.3**	**365.4**	**381.2**
Machinery	16.6	21.2	16.5	19.2	20.7	20.7	20.7
Depreciation	163.8	159.8	171.8	155.3	165.4	165.4	165.4
Rent	102.9	101.5	104.4	105.3	109.9	109.9	109.9
Interest	10.8	5.5	9.7	3.2	0.8	0.8	0.8
Total fixed costs	**294.1**	**288.0**	**302.4**	**283.1**	**296.7**	**296.7**	**296.7**
Total costs	**658.2**	**655.3**	**653.2**	**631.1**	**657.1**	**657.1**	**657.1**
Total unpaid labour (hrs)	78.4	79.4	76.3	88.9	78.9	78.9	78.9
Average hourly wage	2.2	2.4	2.6	2.7	3.0	3.2	3.3
Total unpaid labour	174.5	190.5	194.8	242.1	240.3	253.1	262.0
Total cost including unpaid labour							
Variable cost	521.2	538.7	526.1	565.9	576.6	593.1	616.9
Fixed cost	311.5	307.1	321.9	307.3	320.8	322.1	322.9
Total cost	832.7	845.7	848.0	873.2	897.4	915.2	939.9

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

In **Spain** the situation is similar. The difference with the cost of producing maize is however more pronounced. Costs of growing maize are about one-third less than those for cotton. In particular, costs for seed and energy are relatively higher for maize, while costs for crop protection products are relatively higher for cotton. Contracted labour and services, as well as water and fertiliser represent a similar share in the variable cost structure of the two crops. Unpaid labour is about 80% higher in cotton than in maize, although the weight on the total cost of production is similar in the two crops (Tables A6.8, A6.9 and A6.10).

Table A6.8: Average durum wheat production costs Spain, FADN definition (€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	45.3	69.0	96.0	66.4	58.2	58.2	58.2
Fertiliser	52.7	83.2	70.2	103.5	123.7	123.7	123.7
Crop protection	26.3	33.3	46.6	41.2	37.8	37.8	37.8
Other specific costs	2.1	1.1	0.0	1.8	0.7	0.7	0.7
Energy and fuel	49.0	42.9	64.5	17.4	47.2	47.2	47.2
Contracted labour/services	19.1	51.0	14.5	47.0	32.9	32.9	32.9
Water/irrigation	0.0	24.0	34.6	0.0	0.0	0.0	0.0
Other direct costs	13.0	22.5	27.9	10.7	32.5	32.5	32.5
Labour (paid)	61.6	18.9	71.6	9.9	13.0	13.0	13.0
Total variable costs	**269.1**	**345.9**	**425.9**	**297.8**	**346.0**	**346.0**	**346.0**
Machinery	16.1	5.3	15.9	6.9	40.7	40.7	40.7
Depreciation	16.9	56.5	79.7	23.7	22.7	22.7	22.7
Rent	32.6	30.1	82.0	53.9	14.3	14.3	14.3
Interest	0.0	0.0	11.2	0.0	0.0	0.0	0.0
Total fixed costs	**65.6**	**91.9**	**188.8**	**84.5**	**77.6**	**77.6**	**77.6**
Total costs	**334.7**	**437.8**	**614.7**	**382.3**	**423.7**	**423.7**	**423.7**
Total unpaid labour (hrs)	49.3	93.9	59.7	148.5	134.0	134.0	134.0
Average hourly wage	5.1	5.4	5.8	5.2	5.4	5.6	5.8
Total unpaid labour	249.9	509.5	348.6	769.7	728.7	753.2	779.7
Total cost including unpaid labour							
Variable cost	494.0	804.4	739.6	990.6	1 001.9	1 024.0	1 047.8
Fixed cost	90.6	142.8	223.7	161.5	150.5	152.9	155.6
Total cost	584.6	947.3	963.3	1 152.0	1 152.3	1 176.9	1 203.4

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

Table A6.9: Average sunflower production costs Spain, FADN Definition (€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	31.1	41.2	66.3	65.3	55.1	55.1	55.1
Fertiliser	18.0	59.8	61.3	25.8	51.7	51.7	51.7
Crop protection	7.8	28.7	35.3	39.4	26.3	26.3	26.3
Other specific costs	2.2	0.3	0.0	2.2	0.0	0.0	0.0
Energy and Fuel	40.3	40.0	55.0	28.6	30.5	30.5	30.5
Contracted labour/services	21.0	13.3	26.0	63.6	58.7	58.7	58.7
Water/irrigation	0.1	13.7	15.3	3.1	0.2	0.2	0.2
Other direct costs	6.3	16.4	27.4	54.0	44.5	44.5	44.5
Labour (paid)	3.8	26.5	20.7	23.3	50.1	50.1	50.1
Total variable costs	**130.5**	**239.9**	**307.2**	**305.4**	**317.1**	**317.1**	**317.1**
Machinery	8.9	12.4	16.0	16.3	18.3	18.3	18.3
Depreciation	21.7	24.3	37.6	13.8	22.8	22.8	22.8
Rent	9.1	11.2	10.6	65.3	48.6	48.6	48.6
Interest	0.0	0.0	1.1	7.2	0.5	0.5	0.5
Total fixed costs	**39.8**	**47.9**	**65.4**	**102.7**	**90.3**	**90.3**	**90.3**
Total costs	**170.2**	**287.8**	**372.6**	**408.0**	**407.4**	**407.4**	**407.4**
Total unpaid labour (hrs)	40.6	45.3	40.4	75.5	59.8	59.8	59.8
Average hourly wage	5.1	5.4	5.8	5.2	5.4	5.6	5.8
Total unpaid labour	206.0	245.7	236.0	391.5	325.4	336.3	348.2
Total cost including unpaid labour							
Variable cost	315.9	461.0	519.6	657.7	609.9	619.8	630.5
Fixed cost	60.4	72.5	89.0	141.8	122.8	123.9	125.1
Total cost	376.2	533.5	608.6	799.5	732.8	743.7	755.6

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses

Table A6.10: Average Maize Production Costs Spain, FADN Definition (€/hectare)

	2000	2001	2002	2003	2004	2005 (e)	2006 (e)
Seed	125.4	155.1	155.5	223.7	189.6	189.6	189.6
Fertiliser	99.5	214.7	264.9	179.4	199.7	199.7	199.7
Crop Protection	36.0	114.2	99.7	103.4	59.4	59.4	59.4
Other Specific Costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy and fuel	35.4	68.7	76.3	48.4	102.0	102.0	102.0
Contracted labour/services	143.2	45.8	62.7	169.8	214.5	214.5	214.5
Water/irrigation	32.0	78.5	54.5	102.7	171.7	171.7	171.7
Other direct costs	25.5	30.2	34.0	156.8	130.4	130.4	130.4
Labour (paid)	31.9	84.4	99.7	165.3	117.8	117.8	117.8
Total variable costs	**528.9**	**791.7**	**847.1**	**1 149.5**	**1 185.2**	**1 185.2**	**1 185.2**
Machinery	1.2	43.9	70.8	60.8	64.3	64.3	64.3
Depreciation	140.7	82.0	67.3	60.1	76.7	76.7	76.7
Rent	213.7	15.5	16.5	74.3	227.6	227.6	227.6
Interest	4.5	1.0	0.0	0.0	15.0	15.0	15.0
Total fixed costs	**360.1**	**142.5**	**154.6**	**195.3**	**383.7**	**383.7**	**383.7**
Total costs	**889.0**	**934.2**	**1 001.8**	**1 344.8**	**1 568.8**	**1 568.8**	**1 568.8**
Total unpaid labour (hrs)	60.1	119.1	113.8	159.9	103.0	103.0	103.0
Average hourly wage	5.1	5.4	5.8	5.2	5.4	5.6	5.8
Total unpaid labour	304.5	646.1	664.1	829.0	560.4	579.3	599.6
Total cost including unpaid labour							
Variable cost	803.0	1 373.3	1 444.8	1 895.6	1 689.5	1 706.5	1 724.8
Fixed cost	390.5	207.1	221.0	278.2	439.7	441.6	443.6
Total cost	1 193.5	1 580.3	1 665.8	2 173.8	2 129.2	2 148.1	2 168.5

Source: 2000–2004 FADN, 2005 and 2006 based on LMC questionnaire responses.

Table A6.11: Spain – the decision whether or not to harvest cotton

	Cotton	Cotton (agri-environ. payments)	Cotton (no agri-environ. payments)	Cotton (low input-low yield)
Agri-environment payment	No	Yes	No	No
Supplementary payment	Yes	Yes	Yes	No
Harvest cotton				
Derived yield (tonnes/ha)	4.13	2.56	2.56	1.00
Payments				
Agri-environment payment (€/ha)	0	350	0	0
Additional payment (€/ha)	191	191	191	0
Gross margin (€/ha)	505	878	528	450
Not harvest cotton				
Revenue forgone				
Sales price (per tonne)	244	244	244	244
Sales price (per hectare)	1008	626	626	244
Costs foregone				
Harvesting (per hectare)	255	255	255	255
Transport (per tonne)	20	20	20	20
Transport (per hectare)	83	51	51	20
Gross margin (€/ha)	–165	558	208	481

Source: LMC.

Table A6.12: Returns to cotton and alternative crops (€ per hectare)

COTTON	Average (2001 – 2005)		
	Makedonia-Thraki	Thessalia/Sterea	Spain
Price per tonne (€/t)	818.4	845.9	940.9
Yield (t/ha, unginned)	3.2	3.5	3.7
Total revenue	2 568.8	2 973.8	3 435.5
Gross margin (excluding family labour)	1 436.1	1 919.4	1 958.2
Return to family labour (per hour)	6.7	8.5	14.1
Gross margin (including family labour)	907.10	1 331.1	1 209.1
Total profit (excluding family labour)	574.30	1 250.4	1 577.8
Return to family labour (per hour)	2.70	5.50	11.20
Total profit (including family labour)	–13.50	596.80	745.50

DURUM WHEAT	Average (2001 – 2005)		
	Makedonia-Thraki	Thessalia/Sterea	Spain
Income per tonne (€/t)	144.7	148.8	140.4
Coupled payment (€/ha)	152.1	152.1	239.4
Durum wheat zone supplement (€/ha)	341	341	247.7
Yield (t/ha)	2.8	3.8	3.4
Total revenue	905.1	1 052.6	969.6
Gross margin (excluding family labour)	546.8	680.1	617.3
Return to family labour (per hour)	6.8	6.8	5.9
Gross margin (including family labour)	253.4	419.2	57.5
Total profit (excluding family labour)	340.6	439.3	513.2
Return to family labour (per hour)	4.2	4.4	4.7
Total profit (including family labour)	609.1	147.9	–108.7

MAIZE	Average (2001 – 2005)		
	Makedonia–Thraki	Thessalia/Sterea	Spain
Income per tonne (€/t)	142	148.9	132.5
Coupled payment (€/ha)	540.5	540.5	398.4
Yield (t/ha)	11.9	11.9	11.7
Total revenue	2 306.2	2 306.2	1 944.9
Gross margin (excluding family labour)	1 307.9	1 371.8	913.20
Return to family labour (per hour)	6.60	6.90	7.90
Gross margin (including family labour)	810.60	1 158.2	323.00
Total profit (excluding family labour)	732.60	1 371.8	661.30
Return to family labour (per hour)	3.7	6.9	5.7
Total profit (including family labour)	177.4	633.4	5.5

SUNFLOWERS	Average (2001 – 2005)		
	Makedonia–Thraki	Thessalia/Sterea	Spain
Income per tonne (€/t)	–	–	241
Coupled payment (€/ha)	–	–	239.4
Yield (t/ha)	–	–	2.2
Total revenue	–	–	779.9
Gross margin (excluding family labour)	–	–	482.5
Return to family labour (per hour)	–	–	9
Gross margin (including family labour)	–	–	206.2
Total profit (excluding family labour)	–	–	403.2
Return to family labour (per hour)	–	–	7.6
Total profit (including family labour)	–	–	96.2

A6.3 Change in costs following the change in regime

On the basis of the data on the inputs used resulting from the survey carried out by LMC, the costs of production for 2005 and 2006 have been estimated.

As regards family labour time spent on cotton, most of the respondents reported that it remained unchanged between 2005 and 2006. Paid labour fell while contracted labour rose (Table A6.13).

Table A6.13: Days per hectare spent on cotton production, Greece

Labour	2006	2005	Change
Household	10	10	0%
Paid	4	4	–3%
Contracted	3	3	6%

Source: LMC Questionnaire, from a sample of 200 cotton growers

The rather stable input use reported in Greece confirms other information that the drop in yields occurred in 2006 was mainly due to adverse weather conditions.

In contrast, the drop in yield in **Spain** is more to be attributed to a significant reduction of the input use, as it emerges from the LMC's survey. Inputs were found to be lower for fertiliser, pesticides and labour (Table 2.19 and Diagram 2.20).

Family labour was reported to be virtually unchanged between 2005 and 2006, while paid and contracted labour decreased (Table A6.14).

Table A6.14: Days spent on cotton production per hectare

Labour	2005	2006	Change
Household	4.40	4.48	2%
Paid	1.03	0.80	–22%
Contracted	0.74	0.58	–22%

Source: Questionnaire LMC.

ANNEX 7 – ECONOMICS OF THE GINNING INDUSTRY

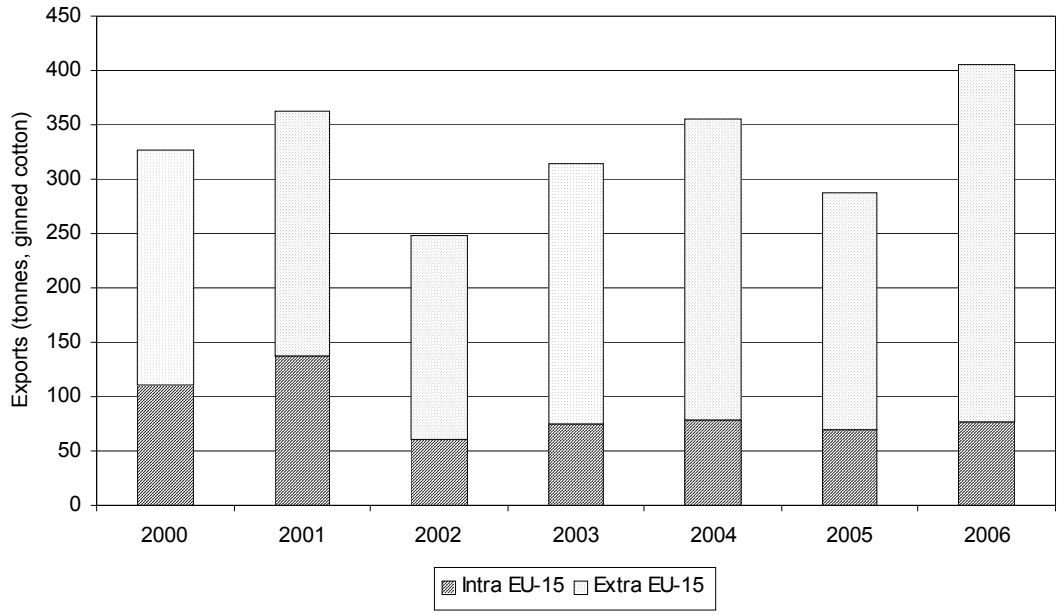
A7.1 The role of the ginner

The ginner purchases unginned cotton from farmers and processes it into ginned cotton and cottonseed. Purchases are on an outright basis. There is no tolling of unginned cotton for farmers. Responses to the questionnaire revealed that purchases are made on a spot rather than forward basis. There are very few ginners who have contracts with individual growers. From the gins interviewed, 16% marketed all their cotton themselves, 33% used a marketer/trader, while 50% used both.

Over the past five years, the volume of sales to EU–15 member states has fallen as the European textile industry has steadily declined. Ginners in Greece and Spain have had to look increasingly outside the Community for markets. Over the last five years, exports accounted for 72% of production in Greece and 45% of production in Spain.

Greek exports are dominated by exports to Turkey and North Africa. In Spain, EU–15 exports were the most important until 2006 (Table A7.1).

Diagram A7.1: EU–15 Cotton ginned exports

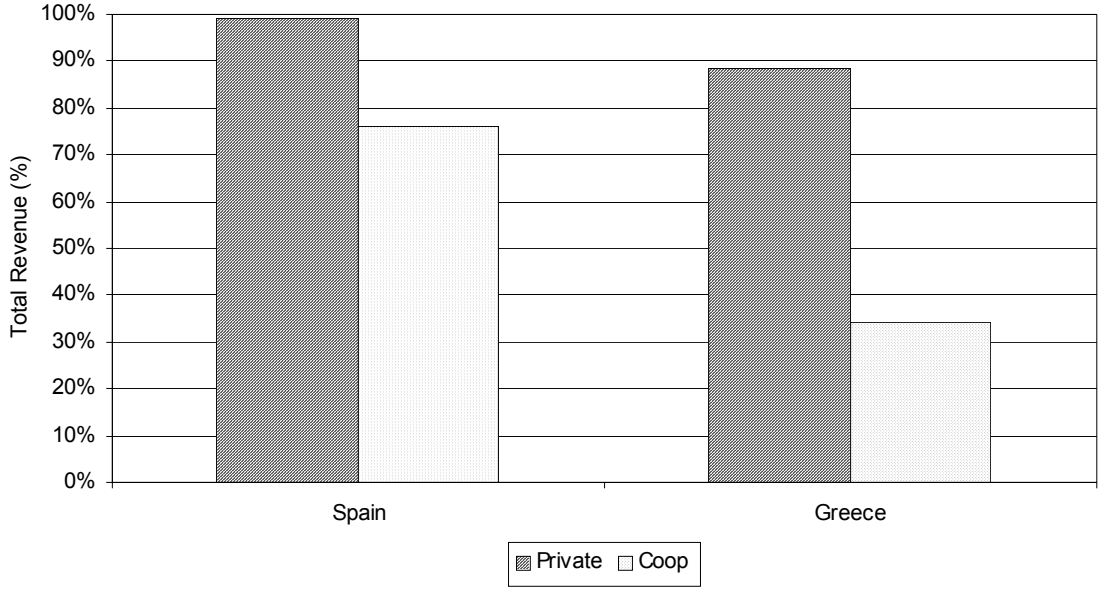


Source: Eurostat

All but one of the Greek ginners interviewed belonged to an inter–branch organisation. These were thought to be useful for solving problems in the sector and for improving quality. All ginners purchased cotton only from other members of the inter-branch organisation. The Spanish experience of inter-branch organisations is more mixed.

Among the companies interviewed, ginning activities accounted for 82% of total revenues in Greece and 87% of revenues in Spain. Cooperative ginning operations also have interests in input distribution and the contracting of services; hence their revenues from ginning alone was lower (Diagram A7.2). In Greece, within the cotton-related activities, a number of companies also crushed cottonseed into oil and cake. Non-cotton activities were linked to the warehousing and storage of other commodities.

Diagram A7.2: Sources of revenues from ginning activities



Source: LMC

A7.2 Capacity and Capacity Utilisation

Spain

Out of a total of 29 ginning mills, 27 were active in Spain in 2005/06 prior to the reforms, of which 85% were located in Andalusia (mainly in Seville Province) with the remainder located in Cartagena Province, in Murcia (Table A7.1).

Table A7.1: Spain – Location of active ginning mills, 2005/06

Community	Province	No. of mills	% of total
Andalusia	Seville	15	56%
	Cordoba	5	19%
	Cadiz	2	7%
	Jaen	1	4%
Murcia	Cartagena	4	15%
Total		**27**	**100%**

Source: LMC, Spanish Ginning Industry Paper

Following the reform, in 2006, six of these gins did not open and one was closed permanently. Of those that opened, many worked only one or two shifts per day, of eight hours per shift.

Capacity levels are difficult to calculate since each factory works for a different number of days and for a different number of hours per day. From the questionnaires, the gins surveyed varied in the number of days operated from 50 to 75 during 2005; the average was 58 days. The number of hours for which each gin operated each day varied between 16 and 24. On the basis of the gins' own data, this resulted in an average capacity utilisation level of 72% in 2005. In 2006, capacity utilisation among the gins we surveyed fell to just 20% and two gins

were closed. The gins that were closed were part of ginning groups operating two or more gins.

In 2004, total employment in the Andalusia cotton-ginning sector was over 1 170 workers, comprising over 250 permanent workers and 920 seasonal workers (equivalent to 11 permanent workers and 40 seasonal workers per mill on average). The provincial distribution of employment reflects the distribution of mills by province (Table A7.2).

Table A7.2: Employment by cotton-ginning sector in Andalusia, 2004

Province	Permanent Workers	Seasonal Workers	Total	% of total
Seville	173	532	705	60%
Cordoba	52	283	335	29%
Cadiz	19	73	92	8%
Jaen	7	32	39	3%
Total	**251**	**920**	**1 171**	**100%**
Average no. of workers per mill	11	40		

Source: LMC, Diagnostico del Sector Algodonero Andaluz.

Greece

The high cotton prices seen during the period of 1995–1999 stimulated Turkey to expand its textile production, and in turn, Greece expanded its cotton production for exports to Turkey. By 2000, Greek ginners expanded processing capacity to meet the demand for more cotton. 73 ginning mills were active in Greece in 2005/06, of which one third were located in Makedonia, with the remainder mainly located in Thessalia, Central Greece (Sterea – Levadia) and Thrace (Table A7.3). Of the gins in operation, eight are co-operatives, the rest are operated by the private sector.

Table A7.3: Greece – Location of active ginning mills, 2005/2006

	No. of mills	% of total
Macedonia	24	33%
Thessalia	21	29%
Sterea (Levadia area)	20	27%
Thrace	7	10%
Epiros	1	1%
Total	**73**	**100%**

Source: LMC.

The Greek ginning sector is undergoing consolidation, with two companies, Karagiorgos Bros. SA and Hellenic Fabrics/Accas Group (the owner of Thrace and Thessalia Ginning Mills) expected to account for around 30% of total cotton production by 2006/07. These two companies rented a number of poor-performing gins in 2006/07 to reduce transportation costs.

As with Spain, capacity utilisation levels are difficult to calculate as each factory works for a different number of days and different number of hours. From the questionnaires, the gins surveyed from 26 to 110 in the number of days operated during 2005; the average was 75 days. The number of hours for which each gin operated each day varied between 8 and 24. If we take the gins' own data of daily processing capacity and multiply it by the number of days worked during 2005 and assume that this is total capacity, then the average capacity utilisation level was 61% in 2005. This over-estimates capacity to the extent that it assumes plants could run for 24 hours a day. In 2006, with lower production, capacity utilisation levels fell among the gins. Using the same approach, capacity utilisation for the companies surveyed fell to 43%.

However, the calculation is not as simple as that. Following the change in regime there were no longer any restrictions on the number of days per season for which a gin could operate. Previously, gins were obliged to operate during a specific period. This was because the Aid was paid to the ginner, and it was felt that by restricting the operation period, inspections could be carried out more easily. Without this restriction, in 2006 the mills were free to operate for a longer number of days. The gins took advantage of this and increased the number of days worked, but reduced the number of hours worked each day. This reduced the need for nightshifts and overtime, thus reducing wage costs.

On average, the number of days worked increased to 81, while the number of hours worked per day fell to 13. In total, the number of hours worked by the plants over the whole season fell by 16% (Table A7.4).

Table A7.4: Number of ginning days and hours worked in Greece, 2004–2006

	Days worked		Hours per day	
	Average	Total	Average	Total
2004	73.3	2 493	14.8	459
2005	75.2	2 631	15.5	497
2006	80.5	2 818	12.6	389

Source: LMC.

The average Greek ginning mill employs 10 permanent and 30 seasonal workers; this suggests that total employment in the Greek ginning sector is around 3 200 workers.

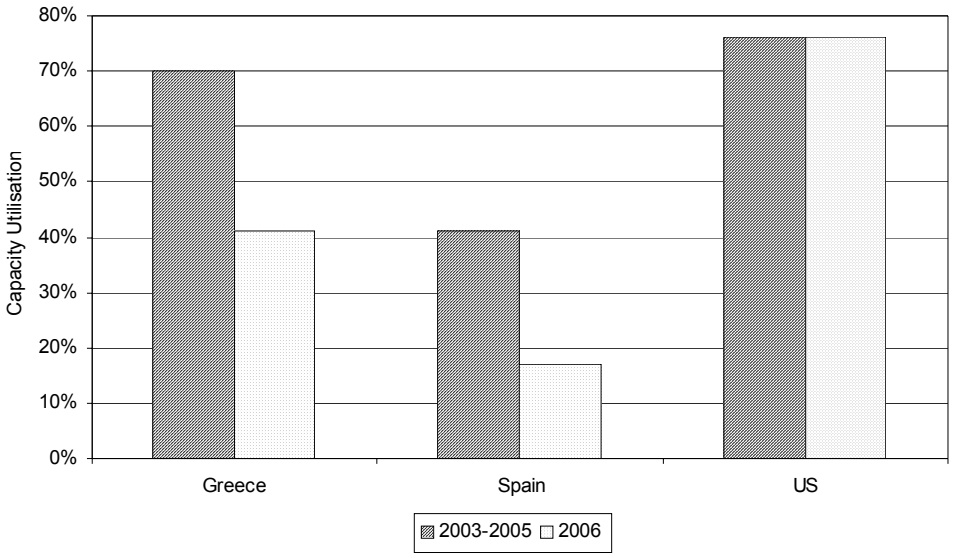
Benchmarking

On an industry-wide basis, to derive an objective measure of capacity, we have calculated capacity on the basis of US industry parameters. In the US there is, on average, an 81 day season based on two shifts (average operating time was 17.5 hours). We have recomputed the EU daily capacity numbers using data from ginning companies, adjusted to allow for two shifts. Where we have no capacity data (5 companies out of 27 in Spain and 10 out of 50 in Greece), we have estimated capacity as the average capacity of the companies from which we have data. This puts total ginning capacity at 0.86 million tonnes of unginned cotton in Spain and 1.60 million tonnes of unginned cotton in Greece.

On this basis, the capacity utilisation level for the whole industry in Greece is estimated to have averaged 70% in 2003–05 and to have fallen to 56% in 2006, while in Spain capacity

utilisation is estimated to have been 41% in 2003–2005, falling to 17% in 2006. In the US capacity utilisation is estimated around 75% (Diagram A7.3).

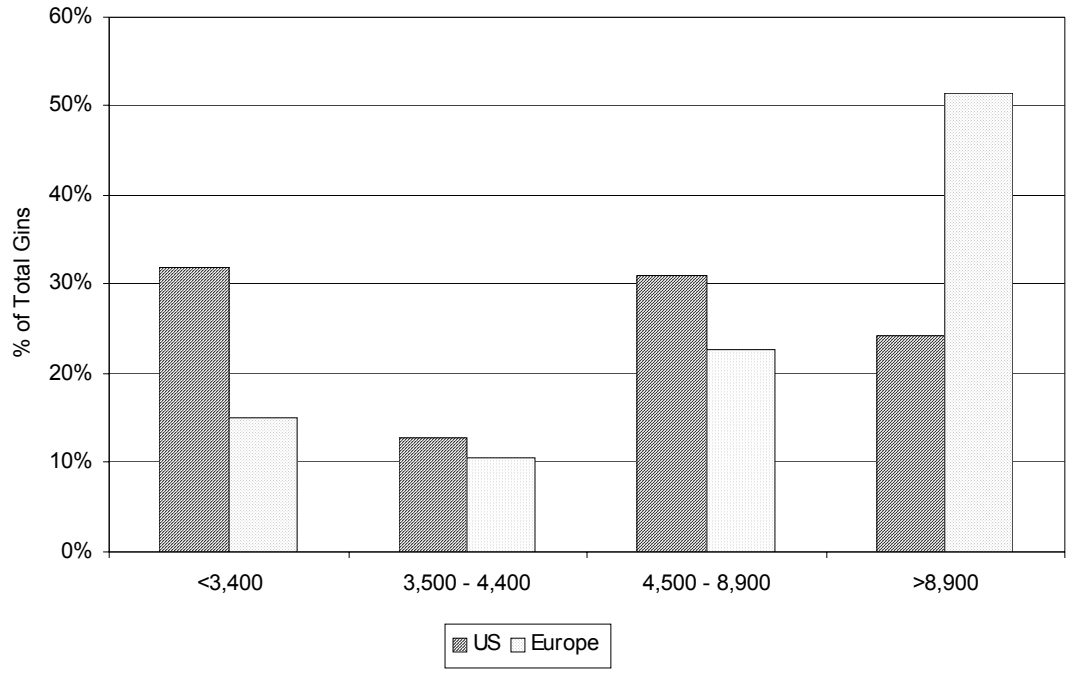
Diagram A7.3: Average US and EU gin capacity utilisation, 2003–2005 vs. 2006



Source: Industry Interviews, LMC estimates

The average gin capacity in the EU is much larger than in the US (Diagram A7.4). In the EU, about half of the gins have over 9 000 tonnes of annual capacity, with several rated at 22 000 tonnes. By contrast, only 25% of US gins are rated at over 9 000 tonnes of ginned cotton, and very few of these have 22 000 tonnes capacity.

Diagram A7.4: Comparison of US and EU gin capacity by size of gin



Source: Industry Interviews, USDA, LMC estimates

Ginning Production Costs

From the questionnaires we are able to gain an impression of ginning costs and how these have changed.

Greece

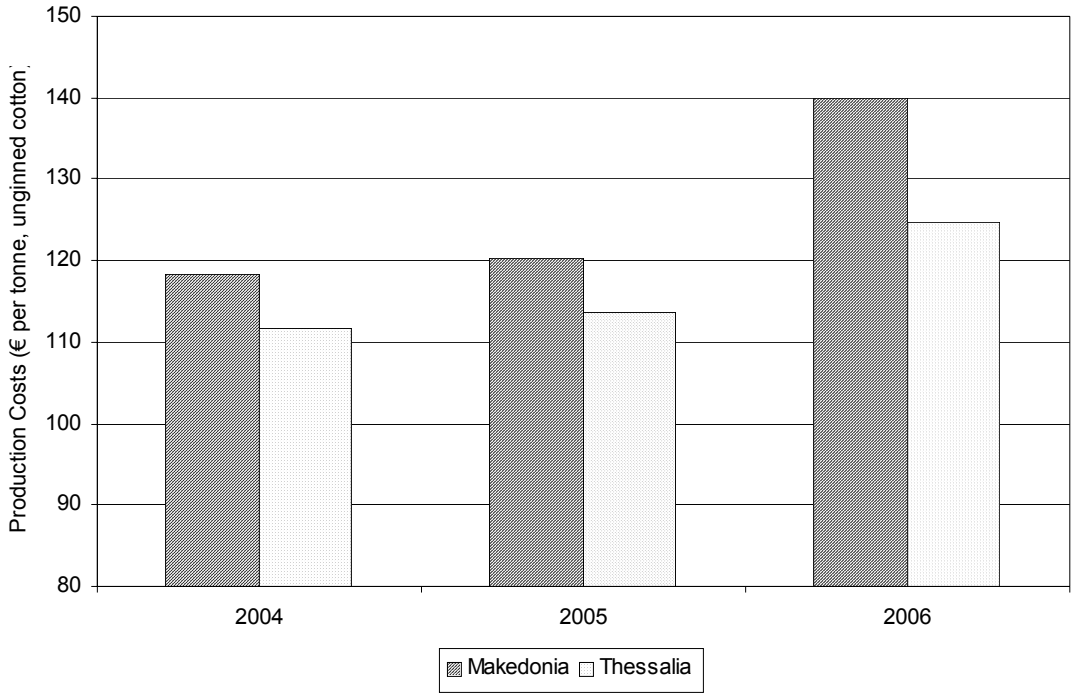
From the questionnaire respondents, Greek ginning costs averaged €118 per tonne of unginned cotton in 2004 and 2005 and rose to €135 per tonne in 2006. Fixed costs accounted for 37% of total costs, rising to 39% in 2006 (Table A7.5). Costs are higher in Makedonia than in Thessalia (Diagram A7.5).

Table A7.5: Average Greek ginning costs, 2004–2006 (€ per tonne, unginned cotton)

	Ginning	Storage	Sales/marketing/ transport	Fixed costs	Other	Total costs
2004	44	8	9	44	13	117
2005	45	9	9	43	12	119
2006	50	10	10	53	12	135

Source: LMC.

Diagram A7.5: Ginning costs, Macedonia vs. Thessaly



Source: Questionnaire and LMC estimations

With the fall in capacity utilisation, variable costs rose by 9% between 2005 and 2006, while fixed costs rose by 23%. The rise in costs would have been greater but for ginners' efforts to reduce costs, such as changing shift patterns. With shorter shifts, the level of unskilled labour employed in the gins fell by 15% in 2006. Skilled labour employment was unchanged (Table A.7.6).

Table A7.6: Gin employment levels among Greek questionnaire respondents (persons)

	Total employment	Skilled (ginning)	Skilled year round	Unskilled
2004	94	26	20	49
2005	90	24	19	47
2006	82	23	19	40

Source: LMC.

Spain

In Spain, there was a wide range of reported costs, and the size of the ginning operation does not seem to have influenced the costs significantly. Among the questionnaire respondents, ginning costs averaged €100 per tonne of unginned cotton in 2004 and 2005 and rose to €149 per tonne in 2006.

Fixed costs accounted for 50% of total costs rising to 55% in 2006 with the lower level of capacity utilisation (Table A7.7).

Table A7.7: Average Spanish ginning costs, 2004–2006 (€ per tonne, unginned cotton)

	2004	2005	2006
Total cost	99	102	149
Variable	49	54	67
Fixed	50	49	82
Fixed % of total	50%	47%	55%

Source: LMC.

With the fall in capacity utilisation, variable costs rose by 24% between 2005 and 2006, while fixed costs rose by 69%. In order to reduce costs (both fixed and variable), the levels of employment fell significantly in 2006. Casual workers and skilled staff linked directly to the ginning operation were the major losers. Permanent staff were largely unaffected as ginners sought to continue their operations and continue to provide a range of services (Table A7.8). Discussions with ginners suggest that this trend will continue in 2007, but that by 2008 the number of permanent staff, too, will begin to decline if capacity utilisation levels do not rise.

Table A7.8: Gin employment levels among Spanish questionnaire respondents (persons)

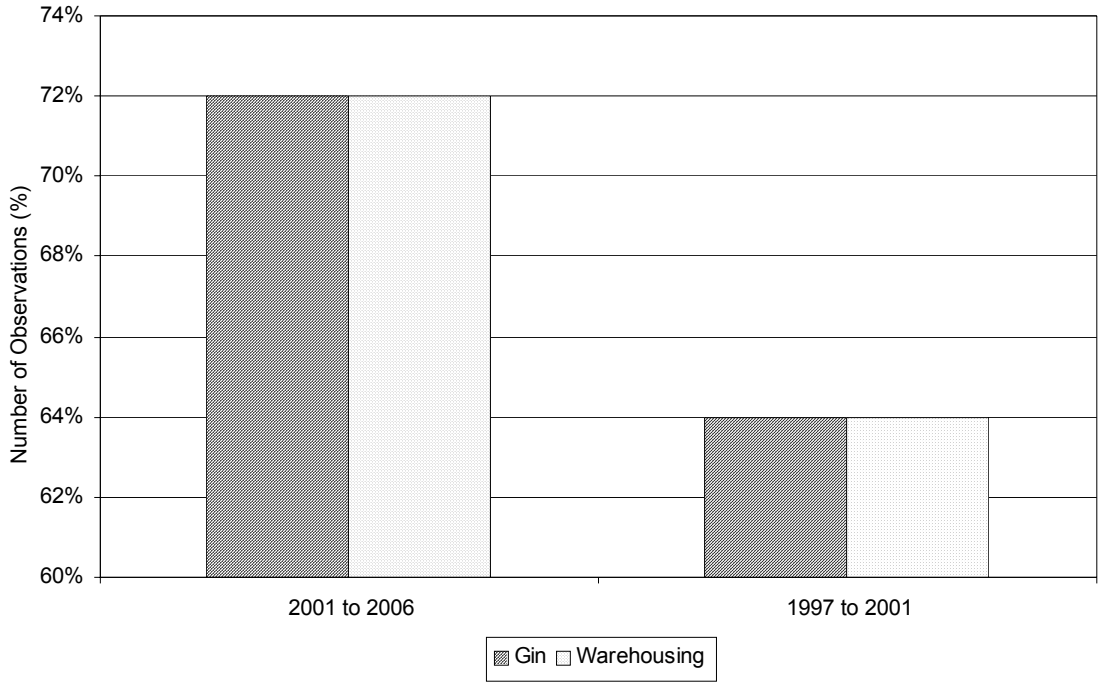
	Total employment	Skilled (ginning)	Skilled year round	Unskilled
2004	276	155	71	89
2005	270	142	71	82
2006	216	95	74	47

Source: LMC.

Investment

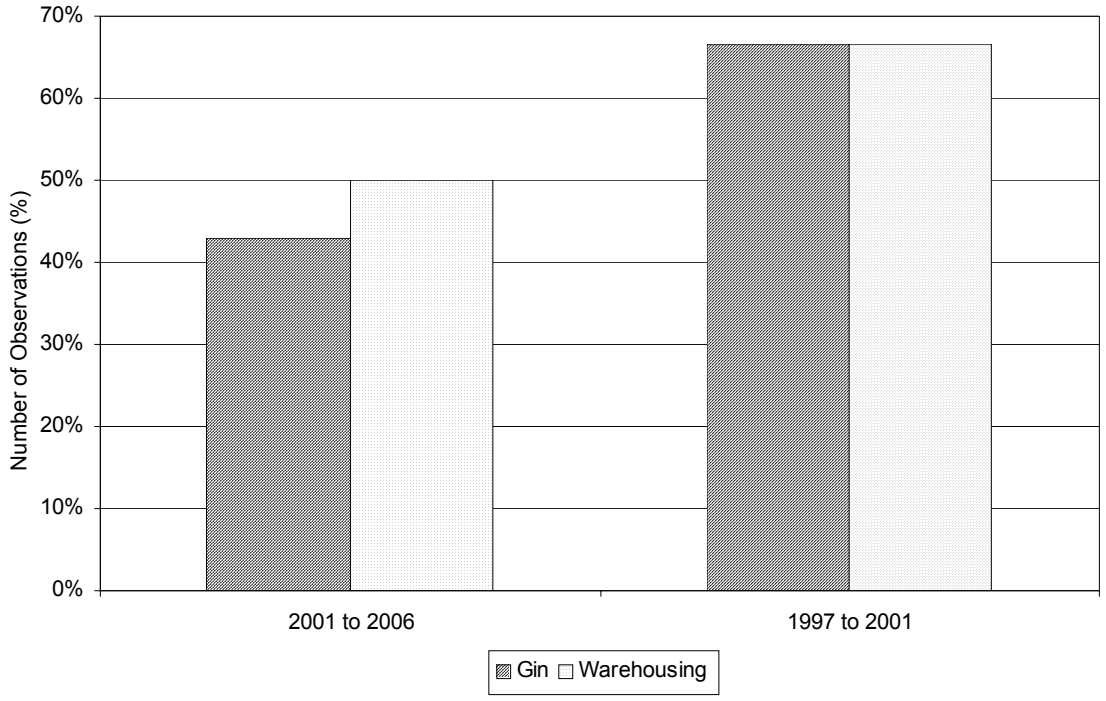
Capital investment in the gins varies considerably between years. When asked how investment in the ginning operation and warehousing had changed over the last five years, in Greece 72% of the respondents reported that investment had increased over the last five years. This increase was largely in increasing the capacity of ginning operations and improving ginning machinery to increase the quality of production.

Diagram A7.6: Proportion of Greek gins reporting an increase in investment in 1997–2001 and in 2001–2006



Source: LMC estimates.

Diagram A7.7: Proportion of Spanish gins reporting an increase in investment in 1997–2001 and in 2001–2006



Source: LMC.

In Spain, fewer than 50% of the respondents reported an increase in investment. In the rest of cases, investment was unchanged from previous years. Investment in warehousing capacity was also greater in Greece than Spain (Diagrams A7.6 and A7.7).

ANNEX 8 – ENVIRONMENTAL IMPACTS

Table A8.1: Evolution of input use in cotton sector in Greece (2000/2005)

	Fertilisers (kg/ha)	Pesticides, insecticides and fungicides (kg/ha)	Herbicides (kg/ha)	Irrigation (m3/ha)
Increase	48%	50%	49%	31%
No Change	29%	36%	43%	59%
Decrease	22%	14%	8%	10%

Source: Alliance Environnement.

Table A8.1 presents the evolution of input use in the cotton sector in Greece from 2000 to 2005. Between 2000 and 2005 the change in input use in Spain has been insignificant. None of the small holdings (below 10 ha) changed its practices, for holdings between 10 and 20 ha the majority (75~87%) of holdings showed no changes and for the holdings above 20 ha as much as 87~95% of holdings did not change their practice. In the medium-sized holdings, the trend was to reduce the input use and the use of phytosanitary products (Table A8.2)

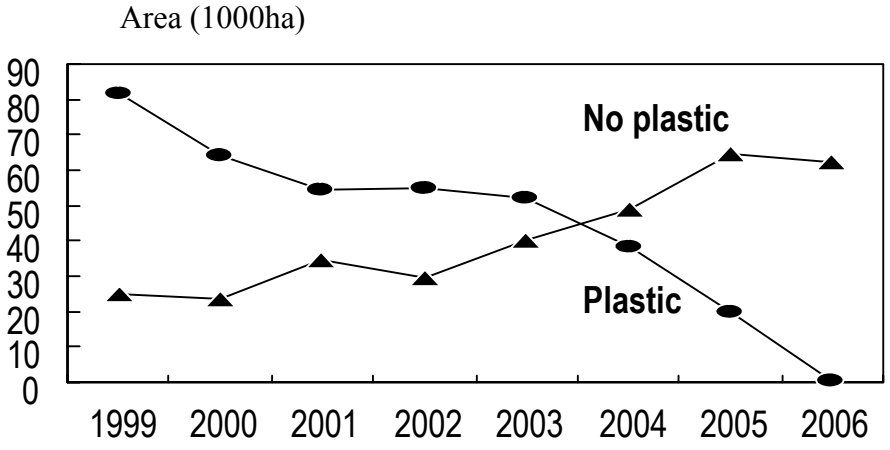
Table A8.2: Evolution of input use in cotton sector in Spain (2000/2005)

Farm size	Evolution	Fertilisers (kg/ha)	Pesticides, insecticides and fungicides (kg/ha)	Herbicides (kg/ha)	Irrigation (m3/ha)
< 10 ha	No change	100%	100%	100%	100%
10 – 20 ha	Decrease	25%	16%	8%	8%
	No change	70%	76%	87%	87%
	Increase	5%	8%	5%	5%
> 20 ha	Decrease	0%	5%	0%	0%
	No change	95%	87%	95%	95%
	Increase	5%	8%	5%	5%

Source: Alliance Environnement.

The use of plastic in cotton production has been declining steadily since 2000, especially in Spain (Diagram A8.1). In Greece traditionally the use of plastic has been much smaller.

Diagram A8.1: Evolution of the use of plastic covers in Spain (1999/2006)

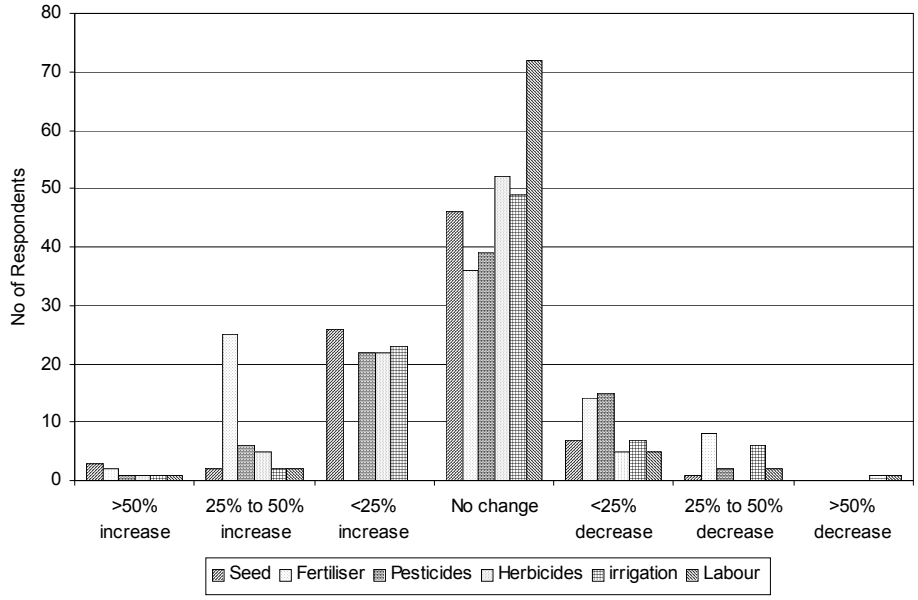


Source : CAPJA

The pollution of water is identified as the biggest problem, an evidence of this is the fact that cotton is largely grown in areas that have been designated as Nitrate Vulnerable Zone according to the Nitrate Directive. A reduction of irrigation water has been noted in Spain.

Finally, the attractiveness of agri-environmental measures was quite limited under this scenario, as it is evidenced inter alia by the number of participants up to 2005. The high prices implied by this scenario made the respect of the environmental constraints, especially to fertiliser usage, costly for cotton producers. To have the same degree of farmers' participation to the agri-environmental programme, this scenario implies a higher level of agri-environmental payments.

Diagram A8.2: Change in per hectare input use for cotton in Greece, 2005 vs. 2006



Source: LMC

Table A8.4: Change cotton in input use per hectare in Spain, 2005 vs. 2006

Farm size	Evolution	Seed	Fertilisers (kg/ha)	Pesticides, insecticides and fungicides (kg/ha)	Herbicides (kg/ha)	Irrigation (m3/ha)
< 10 ha	Decrease	60%	100%	100%	60%	60%
	No change	40%	0%	0%	40%	40%
10 – 20 ha	Decrease	45%	79%	77%	41%	63%
	No change	45%	9%	11%	50%	27%
	Increase	9%	12%	11%	8%	9%
> 20 ha	Decrease	44%	88%	87%	15%	75%
	No change	56%	9%	12%	85%	21%

Source: LMC.

Comparing the environmental impacts of the integrated production and the most common practices it can be stated that in Spain 40% of small holdings (below 10ha) did not change the use of herbicides and irrigation per ha, whereas a significant percentage indicated a decrease. Regarding the medium-sized holdings (10 to 20 ha) there were different results: 45–50% declared no change concerning the use of herbicides and seeds, while an important percentage indicate a decrease in use of irrigation, pesticides, fertilisers and seeds. As for big holdings (above 20ha) 85% declared no change in herbicides use, whereas 75–88% mentioned a reduction in the use of irrigation water, pesticides and fertilisers.

In addition, cross-compliance rules apply.

Table A8.5: Evolution of irrigated cotton surface in Spain between 2005 and 2006

	2005		2006	
	Area (ha)	%	Area (ha)	%
Irrigated area	82 624	98%	59 380	95%
Non-irrigated area	1 708	2%	3 436	5%
Total area	84 322	100%	62 816	100%

Source: CAPJA.

Agri-environmental measures

Spain

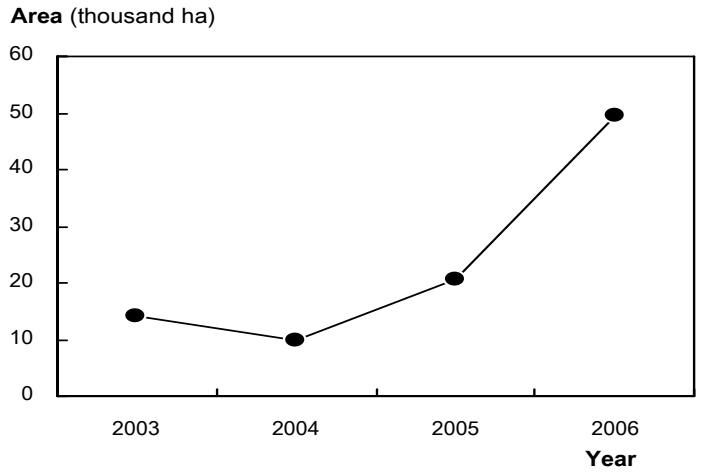
In order to benefit from the integrated production scheme (350€/ha) the farmers were obliged to fulfil several criteria:

– reduction of nitrogen input by at least 20% (with a maximum quantity of 118.3 NFU/ha),
– nitrogen input is forbidden after bolls ripening,
– urea input is forbidden in the second half of the cultivation season,
– reduction in phosphorus and potassium inputs by 20%,

– reduction in the number of phytosanitary treatments (two treatments less for each cultivation cycle in average) and application base pest monitoring,
– elimination of the plastic cover,
– slurries are forbidden,
– spraying pressure for PPP (plant protection products) below 15ka/cm^2 and PPP is forbidden in unfavourable conditions,
– pest monitoring will be maintained until the end of the vegetative cycle,
– residual herbicides are not permitted either in autumn or on sandy land.

Since the beginning of 2006 this programme was very successful in Spain and the areas under it grew rapidly (Diagram 8.4).

Diagram A8.4: Participation in the agri-environmental programme in Spain (2003/2006)



Greece

The amount of aid for Thessalia ranges from €532–600/ha. The criteria are as follows:

– compulsory set-aside of 25%,
– reduction of nitrogen by 20% in the main crop,
– crop rotation of 25% of the irrigated crops with dry ones,
– obligation to make a soil analysis.

ANNEX 9 – COTTON FIBRE QUALITY

The quality of cotton fibre is determined by a combination of factors, including:

- the variety of cotton;
- agronomic inputs such as fertiliser and irrigation;
- weather factors such as rain at the time of harvest;
- harvest practices such as use of defoliants and use of stripper versus picker machines; and
- ginning practices such as drying temperature and speed of processing.

These various forces affect fibre characteristics, e.g., strength, micronaire (a measure of maturity), fibre length (also called staple length), leaf (a measure of the amount of impurities entrapped among the fibres) and colour (ranging from white to spotted or yellow stained). These quality traits are the basis on which the price of ginned cotton is determined, and on which textile manufacturers decide to purchase particular lots of cotton.

Until the 2006/07 season, Greek and Spanish cotton was considered to have good quality characteristics, with staple (fibre) length of over 28 mm and colour generally below 41 (Table A9.1). Furthermore, in Greece, fibre quality has been improving because of greater penetration of the FiberMax varieties, which have longer fibre and smaller seed. FiberMax varieties now account for about 40% of cotton production.

Following the reform, the quality of ginned cotton from the 2006 crop deteriorated compared to previous years in both Greece and Spain. Some diminution of quality was a result of weather in Greece, but the greatest impact came as a result of poorer farm management. This is perceived by ginners to be the result of the requirement that the coupled payment is made on boll opening rather than harvest. Lower fertiliser and irrigation use in Spain resulted in shorter fibre length. In addition, farmers did not defoliate (the application of a chemical to cause the leaves to fall off) before harvesting, which increased the amount of leaf impurities in the unginned cotton.

In Greece, the fibre length, fibre strength and colour were reported to be of worse quality in 2006, than they had been five years earlier.

Table A9.1: Reported Greek cotton quality, 2006 vs. 2001–2005 (modal response)

	Fibre length	Fibre strength	Micronaire	Colour
Past five years	28.50	29.00	4.05	41
2006	27.50	27.50	4.15	51

Source: LMC.

In Spain, individual quality characteristics were reported by two ginners (Table A9.2). In these cases, the fibre length, fibre strength and micronaire were all said to be of a lower quality in 2006 than it had been in 2005.

Table A9.2: Reported Spanish cotton quality, 2006 vs. 2005

	Fibre length	Fibre strength	Micronaire	Colour
2005	27–28.5	28.9	2.9–4.2	Strict middling – middling
2006	28–28.8	30–30.5	3.7–4.4	Middling – barely middling

Source: LMC.

Another factor that has acted to reduce the quality of both Greek and Spanish cotton, but which is not related to the new regime, is the increasing use of stripper harvesters. The type of cotton varieties grown in both countries is the picker type, with more open bolls, that allows a spindle harvester to be used. The spindle harvester is gentler than stripper harvesters in handling the plant and the bolls, so that few impurities are incorporated into the unginned cotton. However, spindle harvesters are slow and very expensive, and are being replaced by stripper harvesters, which are faster and more affordable, but, because they literally beat the entire plant in the process of harvesting, far more plant matter – sticks, leaves, etc. – are brought into the gin along with the unginned cotton.

The reduced quality of Greek and Spanish cotton has affected the potential export market for ginned cotton. Textile factories in Turkey, which has become the key trading partner for Greece's cotton, need relatively low grade cotton. Therefore, the lower quality of the 2006 cotton is believed to have had only slight impact on Greek exports to its neighbour. However, it has affected trade with the Far East, which requires higher qualities. Spain's trade with the Far East is reported to have fallen sharply in 2007, and it substituted that amount with trade to Turkey, with whom Spain does not traditionally trade large volumes of cotton.

ANNEX 10 – BUDGET EXPENDITURE

Under the old regime, expenditure on cotton aid had a floor of €770 million, and during periods when this level of expenditure would not otherwise have been reached, a higher price was paid to growers. This occurred in 1996, 1998 and 2001. Expenditure peaked at €952 million during 2005 (Table A10.1, Table A10.2).

Table A10.1: European Commission expenditure on cotton aid (€ million)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Advance/balances for previous years	–4.5	0.2	–0.3	–0.3	–11.6	1.0	–0.1	0.5	2.9	0.0	0.0
Advances		575.8	4.2	23.6	12.3	17.3	1.0	1.7	0.0	2.1	0.0
Balances	744.2	88.9	601.7	556.9	678.5	622.3	542.1	567.5	653.5	637.8	726.2
Total Greece	**739.7**	**664.9**	**605.6**	**580.3**	**679.2**	**640.6**	**543.0**	**569.7**	**656.4**	**639.9**	**726.2**
Advance/balances for previous years	0.0	0.0	0.0	0.0	0.4	0.0	–0.1	0.0	0.2	0.0	0.0
Advances		44.5	189.7	108.8	195.2	196.7	157.0	215.5	201.5	163.7	211.4
Balances	57.6	30.6	4.7	71.9	28.3	17.3	33.5	18.8	14.5	31.6	14.4
Total Spain	**57.6**	**75.1**	**194.4**	**180.7**	**224.0**	**214.1**	**190.4**	**234.4**	**216.2**	**195.3**	**225.8**
Total	**797.2**	**740.0**	**800.0**	**761.0**	**903.2**	**854.7**	**733.4**	**804.0**	**872.6**	**835.2**	**952.0**

Source: DG AGRI.

Table A10.2: EU expenditure on cotton aid (€ million)

	Greece		Spain		Total
Production aid 2000–2005 (Option 1)		629.3		212.7	842
Current regime 2006 (Option 2)	➢ Decoupled	367.5	➢ Decoupled	134.3	803.1(*)
	➢ Coupled	202.2	➢ Coupled	72.7	
	➢ Rural Dev.	17.9	➢ Rural Dev	4.1	
	➢ Interprof. org.	3.7	➢ Interprof. org.	0.7	
		591.3		211.8	
Full decoupling (Option 3)	➢ Decoupled	573.4	➢ Decoupled	207.7	803.1
	➢ Rural Dev.	17.9	➢ Rural Dev.	4.1	
		591.3		211.8	

(*) Reference period 2000–2002
Source: DG AGRI.

Under the reformed regime, the total aid targeted at cotton growers was set at €803 million, based on the average budget spent on production aid over the reference period (2001 to 2003).

Initially the Commission proposed that, of this budget, €103 million would be spent on rural development programmes, €418 million on decoupled aid and €278 million on coupled aid.

The basis for this split was that the average aid to the growers (decoupled plus coupled) should equal the average aid actually paid during the reference period less the amount paid to the ginners (i.e., the difference between the guide price and the minimum price) less a balancing adjustment for the difference between the average world price on which the aid applications were fixed and the average actual world price over the same period. However, the final Council decision increased the proportion of decoupled aid at the expense of the rural development funds.

ANNEX 11 – ASSESSMENT OF ADMINISTRATIVE COSTS

Table A11.1: List of measures currently entailing administrative costs

OPTION 1

Information to be notified or tasks to be fulfilled	Producers	Ginners	Member States	Commission	Timing / Frequency	Compulsory / Optional
Quality of unginned cotton		X			every delivery	O
World market price of unginned cotton				X	every 10 days	C
World market price of ginned cotton				X	every day	C
Determination of estimated unginned production			X	X	twice a year	C
Determination of actual unginned production			X	X	once a year	C
Reduction of guide price				X	three times a year	C
weighted average of unginned world market price				X	once a year	C
Total budget expenditures				X	once a year	C
Calculating and fixing aid				X	once a year	C
Determination of the total eligible quantity				X	once a year	C
Aid application		X			every delivery	C
Security referred to aid application		X			every delivery	C
Application of supervised storage		X			every delivery	C
Notification of quantity of ginned cotton		X			once a year	C
Granting advances on the aid			X		every aid application	C
Establishing security for advance on the aid		X			every delivery	C
Provisional reduction of the guide price				X	twice a year	C
Payment of advance on minimum price		X			twice a year	C
Application for area aid provided under IACS	X				once a year	C

Submission of contracts		X			several times a year	C
Stock records		X			continuous process	C
Checks:						
– declaration of areas sown (spot-check 5%)			X		once a year	C
– contracts			X		once a year	C
– balance between unginned and ginned cotton			X		once a year	C
– final quantity of ginned cotton			X		once a year	C
– stock records provided by ginners			X		once a year	C
– cross-checks between areas sown and areas under contracts			X		once a year	C
Penalty scheme			X		once a year	C
Communications for implementation of Regulation (EC) No 1591/2001 (Article 15)			X		several times a year	C
Report on environmental situation:			X		before end 2004	C
– determine actions in favour of the environment (environmentally friendly practices)			X		before end 2004	
– research & development of environmentally friendly practices			X		before end 2004	
– diffusion of results to producers			X		before end 2004	
– respect environmental legislation			X		before end 2004	

OPTION 2

Information to be notified or tasks to be fulfilled	Producers/ Inter-branch organisations	Member States	Commission	Timing/ Frequency	Compulsory/ Optional
Establishing objective criteria for approval of eligible areas		X		once	C
Authorisation of varieties for sowing		X		once	C
Fixing the minimum plant density		X		once	C
Agronomic practices		X			O
Calculating the amount of aid per eligible hectare and estimation of eligible area		X		once per year	C
Authorisation of inter-branch organisations		X		once per year	C
Operating rules for inter-branch organisations	X				C
Aid differentiation (scale)	X				O
Classification of cotton parcels for the scale	X				O
Communications to the producers and Commission (approved varieties, criteria for approving land, agronomic practices)		X		once per year	C

OPTION 3

Information to be notified or tasks to be fulfilled	Producers/ Inter-branch organisations	Member States	Commission	Timing/ Frequency	Compulsory/ Optional
Calculating the amount of producer's entitlement to aid		X		once	C
Aid application	X				
Cross-compliance:					
– Annex IV of Regulation (EC) No 1782/2003		X			C
– Good agronomic practices		X			C
Administrative controls:					
– cross-check		X			C
– spot-check		X			C

ANNEX 12 – REPLY TO IMPACT ASSESSMENT BOARD

Modifications in response to the Impact Assessment Board comments

Comment 1 *"The report should describe **more clearly the problems**, relevant for producers and/or the processing industry, that the reform aims to address; it should present more clearly why a **35%/65% ratio of coupled/decoupled support** was found to meet the objectives of the reform in a better way than any other ratio, and why this ratio respects the principle of proportionality of EU action."*

- **Problem definition**

To explain more clearly the rationale behind the reform of the cotton regime, some changes have been made, in particular to the introduction of Section 2.

This explains the EU's continuing obligation to support cotton production – made when Greece and Spain joined the EC – the subsequent expansion of cotton production in those countries, and the unsustainable growth of the cotton ginning industry.

The reform of the CAP in 2003, introducing a decoupled system of support to most agricultural sectors, highlighted the anomalous situation of the cotton sector. Questions concerning the environmental impact of growing cotton, together with international calls to reduce CAP support for commodities such as cotton, have added to the pressure to reform the cotton regime.

- **The 35% – 65% ratio**

To explain more clearly why this ratio appears the most suitable, some clarifications have been introduced in the following sections:

5.1.3 Economic assessment of the Mainly Decoupled Option (Option 2)

5.1.3.3 Sensitivity analysis of partial coupling. This gives an indication of the likely impact of different levels of coupled payment, i.e.25%, 30% or 40%.

- ✓ Tables 10 and 11 (p.27-28) and the respective explanations have been modified;
- ✓ Tables 12, 13 and 14 (p.30-31) have been added, together with an explanatory text concerning the return under full decoupling in Spain, Thessaly and Macedonia, respectively.

Comment 2 *"More information should be given on the extent to which **Rural Development measures,** e.g. agri-environmental measures, could alter the presented forecasts of impacts under the different options. To what extent could Rural Development measures help mitigate negative impacts, particularly social/employment impacts, of the preferred option in the regions concerned?"*

In order to show how agri-environmental measures can affect farm incomes and may allow farmers to continue growing cotton, additional elements have been added to the Impact Assessment:

- ✓ Tables 5 and 6 on return to unpaid labour with and without agri-environmental measures.

More emphasis has been given to the role of Rural Development measures in mitigating possible impacts of the reform, in particular in Section 5.3.5 Social Impact and Rural Development.

The Impact Assessment shows that, in the medium term, the reform could have major consequences both on the farmer's choice of crops and on the ginning industry. As agreed by the Council in April 2004, €22 million per year (€154 million for the period 2007–2013) is now available in additional rural development funding for Greece and Spain to spend in the regions concerned.

Comment 3 *The report should present more clearly how the issue of* ***family/unpaid labour in cotton production*** *has been taken into account in the analysis under the different options and in the different cotton-producing regions*.

The methodology and results of the two-step analysis provided in Section 5.1 have been clarified.

In addition to the comparison of the gross margin (or profitability) of cotton and the alternative crops, a further analysis was made of the impact of the three options on unpaid family labour. The complete analysis of the close correlation between the gross margin and the return to family labour (Family Farm Income) is now set out in Annex 6 to the Impact Assessment.

Comment 4 *More detailed information should be provided for the* ***environmental impact of each option****, also in relation to alternative crops production, including quantitative data on water demand and pollution, and soil. The Board invites DG AGRI to draw on specific expertise that is available in DG Environment.*

As suggested by the Board, DG AGRI has drawn on the expertise of DG Environment and introduced additional data, where available. Section 5.2 Environmental impacts, has been enhanced by comments received from stakeholders, experts and DG Environment. In particular, details have been added in Section 5.2.1 concerning:

- ✓ water quantity and quality (in particular with regard to Nitrate Vulnerable Zones under the Nitrate Directive);
- ✓ biodiversity and habitats.

A clearer focus has been brought to Section 5.2.2 Environmental impact of alternative crops.