

# European Union, Common Agricultural Policy (CAP) and the afforestation of agricultural land in Greece

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## 1. Introduction - The basic characteristics of Greek forestry

Forestry in Greece is a vital sector that provides both goods and services (wood, grass, recreation, game, water balance maintenance etc.), thus contributing to regional development and the national economy in general. Forests in Greece cover 6,513,068 ha, i.e. 49.3% of its total surface area. Of these, only 3,359,186 ha are industrial forests and the remaining 3,153,882 ha are covered by non-industrial forests. Therefore, industrial and non-industrial forests cover 25.4% and 23.9% respectively of the country's total area. Industrial forests are locations covered by forest trees which produce commercial wood products. Industrial forests are also locations capable of producing a minimum of 1m<sup>3</sup> of wood per ha annually. Conifers cover 42.56 % of the industrial forests' area, while 57.44% is covered by broadleaves. Firs and pines are the most important conifers, while beech and oak are the predominant broadleaves. The total volume of trees in industrial forests amounts to 151,787,819 m<sup>3</sup>, while their marketable volume is 138,107,132 m<sup>3</sup>. Non-industrial forests are areas characterized by branchy, dwarf-like trees and bushes (usually evergreen broadleaves) which do not at present provide marketable wood products and are mainly used for pasture, firewood and for the protection of hydrological basins. The sum of industrial and non-industrial

### Abstract

The rational management of Greek forests and more intensive exploitation of forest land through afforestation for wood production have not had a major impact on reducing the country's dependency on wood and its products. With the accession of Greece into the EEC in 1981, and under the implementation framework of the CAP, subsidies were also provided to the forestry sector. However, during the early years in particular, the subsidies were extremely low, mainly due to the fact that the CAP's basic orientation was to increase food production. The CAP reform in 1992 and 1999 resulted in increased subsidies for the afforestation of agricultural land, both for the purpose of wood production and for the protection of the environment. An important number of agricultural areas, on the plains and in mountainous regions, that had been primarily used for annual crops, were withdrawn from food production and replaced by forest plantations of black locust and poplar predominantly.

### Résumé

*La gestion rationnelle des forêts grecques et l'exploitation plus intensive des terrains boisés avec reforestation en vue de la production de bois n'ont pas contribué de manière significative à la réduction de la dépendance du pays en ce qui concerne le bois et ses produits.*

*L'entrée de la Grèce dans la CEE en 1981 et dans le cadre d'application de la PAC a permis d'apporter également une aide dans le secteur de l'exploitation forestière. Cependant, l'aide apportée; en particulier les premières années, était très modeste, principalement parce que la CAP était surtout orientée vers l'augmentation de la production alimentaire. La réforme de la PAC en 1992 et 1999 a conduit à une augmentation du financement d'aides concernant le boisement d'étendues agricoles en vue tant de la production de bois que de la protection de l'environnement.*

*Un nombre important de terres agricoles, tant en plaine qu'en montagne, portant essentiellement des cultures annuelles, a été reconverti. Au lieu d'une production alimentaire, on y a effectué des plantations forestières, avec comme espèces principales les faux-acacias et les peupliers.*

forests constitutes the forest land (Ministry of Agriculture, 1992). The total production of Greek forests in recent years amounts to an average of 1,600,000 m<sup>3</sup> approximately. Domestic production generally covers 30-35% of the demand for industrial wood, including firewood (Ministry of Agriculture, 2003; Ministry of Agriculture, 2004).

The basic sources of finance for the Greek forestry sector are: the public investments programme, the regular budget, the Central Fund for Agriculture, Livestock and Forests, the European Union etc. The funds made available from the above-mentioned sources are used for activities such as forest protection, forest-technical control of torrents, rangelands, forest

roads, reforestation etc. (Papastavrou, 1996).

The level and structure of public expenditure for forestry is mainly linked to the developmental processes taking place in mountainous regions and depends on the socio-economic and political conditions of the country at any given time. Basic intrinsic reasons that make state intervention and public expenditure and investments in Greek forestry essential are: a) the nature of forest activities (long rotation of 80-120 yrs), b) the ownership status of Greek forests (65% of the land belongs to the state), c) the climatic and soil conditions, the relief and generally the mountainous areas where the Greek forests are mainly located and d) the multi-functional role of forests and forest areas (Arabatzis, 2003).

The increase in forest production, particularly of wood production, is one of the basic aims of any forest policy.

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During the post-war period, there was a significant increase in funding and major efforts were made for the rehabilitation, rational management and exploitation of the degraded Greek forests, which resulted in a greatly increased wood production. However, despite the increase in domestic wood production from natural forests after 1950, Greece today continues to import large quantities, since the domestic production only covers the needs in firewood, panels, plywoods and particleboards (Arabatzis, 2000).

The forecasted reduction in the future production of industrial wood from natural forests at an international level, which is due to a combination of factors (changes in land use standards, degrading of resources) and the increase in wood and wood products' consumption, renders the role of afforestation and reforestation even more significant today (Pandey and Ball, 1998).

The afforestation of agricultural land, the afforestation of newly-established areas (alluvials, dunes, etc.), the reforestation of deforested areas (current pastures, former locations with burnt forests) and the introducing with conifers of degraded deciduous or evergreen vegetation types can greatly contribute to an increase in wood production (Chatzistathis and Dafis, 1989; Mather, 1993).

## 2. The European Union policy

The Common Agricultural Policy (CAP) of the European Economic Community (EEC), or European Union (EU) as it is known today, is considered its most integrated policy. A large part of the EU's legislative work and budget (40% approximately) has been related to CAP funding in recent years (Mattas, 2000).

The existence of a surplus for many agricultural products demanded substantial subsidies for their export, which resulted in a burdening of the EU budget (Papageorgiou, 1995). In order to deal with these problems, the EU took successive measures such as milk production quotas in 1984 and (voluntary) set-aside in 1988. These measures were however minimally effective, which is why the EEC proceeded with the CAP reform in 1992.

The basic framework of the measures was the following: a) major reductions in the prices of agricultural products, b) compensation of income loss due to price reduction through subsidies that were not connected to the produced quantities, c) imposition of production control with mandatory set-aside measures, d) implementation of an action programme aiming to encourage farmers to use production methods that cause less pollution, e) provision of economic incentives to farmers who agree to afforest all or part of their land, f) new early retirement regime on a voluntary basis (EEC, 1993).

In the EEC establishment convention (article 43) there is only mention of common agricultural policy guidelines, without the potential of exercising an integrated forest policy. Nevertheless, the relation between agriculture and forestry, particularly on a farm level, is very important as

regards private forests, and subsequently the EEC also intervenes in the forestry sector through the CAP.

During the meeting on forestry that was summoned by the European Commission in June 1959 in Brussels, the main guidelines were laid down for a potential EEC intervention on forest policy issues. These guidelines were related to forest protection, coordination of information, research and training, wood trade and the structural development of businesses. The transfer and implementation of these guidelines on member state level however, under the umbrella of a community forest policy, came up against certain legal obstacles, the most important of which was that such a policy (a common forest policy) was not provided for in the EEC establishment Treaty (Fennel, 1999; Arabatzis, 2000).

During the 1960s and 1970s, the EEC took certain actions and measures related to forests stemming from the CAP. These measures were primarily an outcome of the CAP because most forests in EEC countries are privately owned and are in general connected to farms. They are mixed farms (agricultural cultivations and forest plantations) located mainly in Central and Northern Europe. Farms in such European regions, mainly in mountainous and disadvantaged areas, represent complex systems in which agriculture, livestock and forestry coexist.

The forest measures also aimed at a direct or indirect benefit to agriculture by reinforcing the effectiveness of its own measures. The main objective of the Directives, Regulations and Decisions adopted by the EEC during that period was agricultural development, and forestry on a secondary basis.

Most of the Directives and Regulations studied in this paper also include the transfer of agricultural land to forestry as one of their basic aims. In 1972, three socio-structural directives were adopted (EC/72/159, EC/72/160, EC/72/161) that constituted the basis of the agricultural structural policy. Of the three, the one most clearly related to the forestry sector was directive EEC/72/160/, which encouraged a pause in agricultural activity and use of the land for structural improvements (Mattas, 2000).

In 1982, regulation 1975/82 was adopted on the acceleration of rural development in certain disadvantaged regions of Greece. Article 1 paragraph 3 included measures related to forest improvements. These measures involved tree planting, the upgrading of deteriorated forests, the construction of forest roads, control of torrents and fire protection. The regulation was applied in 22 Greek prefectures and was completed in 31.12.1989.

Regulation 619/84 was an extension of the programme of regulation 1975/82 for the remaining prefectures of Greece (with the exception of Attica and Thessaloniki). The programme took place from 7.12.84 to 6.12.85 and covered the following activities: reforestations, improvement of forests, protection from forest fires, control of torrents, forest roads, as well as preparatory work and studies on public forestry practices. The EEC covered 50% of the total cost (Mavrovitis, 1987).

During the 1980s, the EEC proceeded with certain actions and measures related to forests that were directly linked to the new orientation of the Common Regional Policy. The signing of the Single European Act (1986) and the doubling of resources for the structural funds, which also included the regional fund, secured significant resources for the forest sector. The Integrated Mediterranean Programmes (IMP) that were enacted through regulation 2088/85 involved actions associated with the forest sector (reforestations), improvement of deteriorated forests, control of fast flowing streams, protection of forests, forest roadworks. A European (community) activity with a series of forest measures coming under the CAP framework was instituted through regulation 797/85, aiming to improve the efficiency of agricultural structures by providing incentives to head farmers concerning the afforestation of their agricultural land (Arabatzi, 2000).

In 1986, the SILVA international conference was a landmark for the protection and development of forests on a European level. Within its framework, the EEC member states were committed to protect trees and forests from any kind of threat, combat the desertification of Mediterranean forests and the decline of forests in the countries of Northern Europe (Angelidis, 1994). At the same time, Regulations and directives were still being adopted, whose basic goal was rural development followed by forest development, particularly in the form of forest plantations.

Regulation 1760/87, an amendment of 797/85, provided for significant subsidies for farmers interested either in directing their production towards non-surplus products or in the extensification of certain surplus products (mainly grains, beef, wine, milk). Extensification meant that either the production would be reduced by 20% while maintaining land size, or that specific areas would be set aside or afforested (Bazin, 1993).

The community actions and initiatives were fragmentary until 1988, and despite the efforts made and the means available, the expected benefits did not occur. Very few areas were withdrawn and even fewer areas were afforested. More specifically, the results for Greece were minimal (Arabatzi, 2000).

With the adoption of the 1<sup>st</sup> Community Support Framework (1<sup>st</sup> CSF), community budget resources increased in favour of the structural funds, while on the contrary, the so-called "budgetary discipline" was imposed on the expenses of the Agricultural Fund-Guarantee. Subsequently, the ensuing Regulations took into account the newly created circumstances.

Regulation 1094/88 was also an amendment to 797/85 and involved systems for transforming surplus sectors, and for the extensification and set-aside of arable land. The structural set-aside, as regulation 1094/85 is known, was implemented in our country from 1990 to 1992, when it was annulled at a European Union level. Over a five-year period, set-aside areas would have to a) remain uncultivat-

ed, or b) be used for non-agricultural purposes (e.g. tourism), or c) be afforested.

In Greece, structural set-aside was implemented in the prefectures of Larissa and Karditsa in an area of 251.5 ha. In the European Union, 1.9 million ha in total were withdrawn (Bourdaras, 1995). From 1988 to 1989, 434,000 ha were set aside in the EU. Of these, only 2.1% were afforested (Fennel, 1999).

Regulation 1096/88 then followed, which was optional for member states and encouraged termination of activities for farm owners over 55 years of age (early retirement), and a move from agricultural use to livestock and forest use. Regulation 1272/88 complements the other stabilizing mechanisms aiming at a reduction in the supply of agricultural products. The regulation proposed a system of financial support for farmers who stopped cultivating their land, regardless of age and farm size, on condition that the fertility of the soil would be protected and any use of organic soil-improving substances would be prohibited. The area to be set aside per farm would be 0.5 ha (Bazin, 1993).

In September 1988, the European Commission for the first time clearly set down the fundamental principles and guidelines that ought to govern any integrated strategy for the forest sector. On 23.09.1988, the Commission issued a communication entitled "EU strategy and action in the Forestry sector" (COM (88) 255 final, which involved long-term planning for forest activities by the EEC on a four-year basis, and stated specific proposals for the implementation of such a strategy. Within the framework of this four-year programme, regulation 1609/89 was also instituted, which is an extension of the measures provided for by regulation 797/85 to all persons, forest associations, cooperatives and communities that proceed with afforestation of their agricultural land (Angelidis, 1994).

In the 1<sup>st</sup> CSF, and the 13 Regional Operational Programmes in particular, forest-related activities are also included such as afforestations, improvements to downgraded forests, mountain region economy etc. Regulation 2328/91 is in essence a codification of the additions and changes that have been made to 797/85 regarding the improvement of the efficiency of agricultural structures. Within the framework of this regulation, the protection and conservation of the environment and the countryside are primary objectives. Therefore, subsidies are given to farmers who develop their activities in regions with a vulnerable natural environment and resources in order to maintain environmentally-friendly methods of production. The forest measures in the regulation also include subsidies for the afforestation of agricultural areas (Arabatzi, 2000).

According to regulation 1765/92, which also mentioned set-aside, 4.7 million ha were withdrawn from productive activities, of which only 26,400 ha were used for non food-related crops (Fennel, 1999).

Within the framework of the CAP, the so-called accompanying measures were added on in 1992, which concern a-

agricultural activities and land use. They involve activities for the conservation of the environment and subsidies for afforestation, along with an early retirement regime for farmers. The Regulations connected to the above-mentioned strategy are regulation EC/2078/92 (on the extensification of agriculture), regulation EC/2079/92 (on early retirement for farmers) and regulation EC/2080/92 (on the afforestation of agricultural areas).

Regulation 2080/92 radically modifies the terms of intervention set down by regulation 1609/89. It includes measures related to subsidies for the afforestation of agricultural areas to cover the labour costs whoever the owner may be, subsidies for the preservation of forest plantations, annual premiums meant to compensate for loss of income, and subsidies for any type of improvement of forested areas on farms (forest roads, protection from forest fires, wind-breaks) (EEC, 1992).

From the above-mentioned statements, we can conclude that the Regulations and directives applied for the afforestation of agricultural areas prior to the CAP reform did not produce the expected results. The number of afforested agricultural areas was very small, possibly due to the fact that the CAP still guaranteed a high income. Nevertheless, the collapse of the Eastern countries and market globalization created a new reality for European agricultural products and consequently for the income of European farmers. Under the new competitive environment being formulated and given the fact that the CAP had eluded or succeeded in some of its basic aims, the CAP review took place in 1992 (Mattas, 2000).

Within the framework of the reform, regulation EC/2080/92 signified a radical change in the forest strategy of the European Union. It was ascertained that forest use of agricultural areas provided an important solution both on the level of the individual farm and on the level of each member-state, since the opportunity was given to these areas to cultivate products of which there was a shortage within the European Union.

Until 31 October 1998, the approved areas for afforestation in the European Union under regulation EC/2080/92 covered 863,523 ha, representing 0.65% of the total agricultural land in use. Portugal is the country with the largest percentage of afforestation (2.85%) of used agricultural land, followed by Ireland (2.2%) and Spain (1.3%); in Sweden, only 2 ha were afforested. The afforested areas in Greece amount to 16,401 ha, i.e. 0.50% of the agricultural land in use (EEC, 2002).

Regulation 1257/99 on rural development, which was passed after the CAP reform in 1999, represents an effort to coordinate the various policies of the agricultural sector. More specifically, it includes and sets up nine different measures that had previously been included in other Regulations: a) investments on farms, b) settlement of young farmers, c) training, d) early retirement, e) less favoured areas, f) agri-environmental measures, g) improvements in the sale of agricultural products, h) afforestation of agricul-

tural areas, and i) enhancement of the adaptation and development of agricultural areas. The 8<sup>th</sup> measure on the afforestation of agricultural land according to article 31 of the regulation, is essentially a continuation of regulation 2080/92. More specifically, the subsidy regime under this article covers expenses for afforestation, provides annual financial support for covering the conservation costs of the afforested areas, and annual financial aid to compensate for the investors' loss of income (CEC, 1999).

### 3. Public expenditures and the Greek policy for the reforestations

Reforestations play a significant role for the Forest Service of Greece. Several reforestation programmes have been implemented from its establishment to the present day, related to the increase in the forest resources of Greece and in order to cover the domestic needs for wood and wood products and improve the natural environment.

The first reforestations efforts in Greece regarding plantations were made in 1862 with the import of the eucalyptus (*Eucalyptus globulus*). During the period 1900-1930, various decorative reforestations took place, mainly by private entities using indigenous species, which covered a total area of 1,200 ha. From 1931 onwards, the main reforestation activities were taken over by the state and took on a purely technical form (Papastavrou and Makris, 1988).

From 1930 to 1950, when the Forest Service was staffed with foresters, the state embarked on afforestation projects for protective and aesthetic purposes. About 25,000 ha were reforested during this period, using the classical method of planting in pits. After 1950, the period of reforestation for wood production begins in Greece. It is characterized by two highly important events: a) the import and cultivation of various poplar clones by the Forest Authority and b) the mechanization of many reforestation tasks, which raised the success level to over 90% (Chatzistathis and Dafis, 1989).

From 1945 to 1975, the total reforested areas for the purposes of wood production, soil preservation and protection, and avoidance of erosion amounted to 140,000 ha. The main objectives of reforestations in Greece are linked to the production of wood or other products, the protection of the soil from erosion and the regulation of the flow of mountain waters, its impact on leisure activities and health, and its regulatory effect on the ecological equilibrium of disadvantaged ecosystems.

The primary forest-policy measures implemented by the Forestry Service as regards forest nurseries and reforestation are: a) the establishment of forest nurseries b) the import and testing of foreign forestry species c) the funding of programmes for the genetic improvement of the indigenous propagating material d) the creation of experimental surfaces with indigenous and foreign forest species covering a large variety of climatic and soil conditions e) the gradual mechanization of work related to forest nurseries and reforestations (Papastavrou and Makris, 1988).

The main species used for reforestation programmes in Greece are: Black pine (*Pinus nigra*), Turkish Pine (*Pinus brutia*), Aleppo pine (*Pinus halepensis*), Monterey pine (*Pinus radiata*), Maritime pine (*Pinus pinaster*) and various poplar clones (Papanastasis, 1982; Romanas, 1982; Damalas, 1983; Panetsos, 1986; Zagas, 2003).

In the period 1976-2002, 112,473 ha were reforested in total all over the country. We therefore observe that the annual reforestation rate on average during the last 27 years was 4,166 ha. If this rate is compared to the areas burnt down each year, which on average for the same period amount to 45,814 ha, then the reforestation rate can be considered insufficient (Ministry of Agriculture, 2003).

#### 4. Afforestation of agricultural land in Greece

One of the basic reasons for forestry practices in Greece is forest production and in particular wood production. However, our natural forests do not suffice to cover our domestic needs for wood, since the Greek forest ecosystems are characterized by severe degrading and also demand long-term forest management and more funding for their development. The increase in forested areas through reforestation did not manage to produce any significant changes in their size. This is due to the fact that reforestations take place on a small scale due to low funding and the inability of locating suitable land due to the conflict with livestock (Arabatzis, 2000).

In order to deal with these problems very early on, at the beginning of the 1930s the Forestry Service established its first poplar plantations on the banks and dykes of rivers, primarily for protective purposes. Later, poplar cultivation was also extended to other suitable areas of rivers and torrents and to irrigation projects in Northern Greece, creating plantations of a purely economic nature. That was the start of the so-called state poplar cultivation on public land. At the same time, the latter also rapidly provided a major boost to private poplar cultivation, which developed with a multiplying effect compared to the state in a very short period (Chatzistathis and Dafis, 1989).

The wood production from poplars amounts to 400.000 m<sup>3</sup>, representing 17% of the total wood production from natural Greek forests. Over 250.000 m<sup>3</sup> of this production is classed as A' category wood, and is equal to about 40% of the wood in this category that is produced by all forests in Greece (Ministry of Agriculture, 1999).

During the last two decades, the cultivation of Christmas fir trees is also developing significantly, mainly in mountainous and semi-mountainous areas. Christmas fir tree plantations are usually established in arid fields that have not been cultivated in the past or which perform marginally when cultivated.

With the accession of Greece to the EEC and within the CAP implementation framework, Regulations were adopted that involved subsidies for the establishment of forest

plantations. Regulation 797/85 included measures for forested areas on farms, and more specifically subsidies for those who were farmers by profession, in order to afforest their agricultural land.

Following this, regulation 1609/89 was adopted that amended regulation 797/85 and extended the measures and subsidies provided for by regulation 797/85. The results from the application of these measures were very poor. From 1985 to 1989 only 154.8 ha of poplar were planted on agricultural land (Karameris, 1993). Furthermore, Skouras (1994) mentions that the applications for the afforestation of farms in 1990 were 296, covering an area of 357.4 ha.

A major incentive for the establishment of forest plantations in Greece was provided by regulation 2080/92, which involves subsidies for the afforestation of agricultural land and the conservation of forest plantations, as well as premiums to compensate for loss of income. It also includes subsidies for the improvement of forested areas, which are granted to farmers, their cooperatives and associations, monasteries, businesses and to any natural or legal private entity, which owns a farm whose revenue provenly accounts for 25% of their income (Arabatzis, 2000).

From 1/1/1993 to 31/12/2002, 16,465 applications were approved. The land that corresponds to that number of applications is 35,840 ha and the eligible costs are 194.6 million Euros (Ministry of Agriculture, 2003).

The planting of broadleaves accounts for 35,096 ha, i.e. 98% of the total afforested area. The poplar cultivation (broadleaf species) that took place on agricultural land from the 1950s onwards, seems to have determined the decision to plant broadleaved forest species. Furthermore, another reason is that the broadleaved forest species established (black locust, walnut and chestnut trees) were of a shorter rotation than conifers.

The afforested agricultural land amounts to 32,877 ha, i.e. 91.2 % of the total afforested area. Of this, arable land and areas with annual crops account for 95.2% and agricultural areas with vineyards and fruit trees for the remaining 4.8%. We therefore observe that the owners of agricultural land are very reluctant to abandon the cultivation of fruit trees in favour of forest plantations. On the contrary, areas cultivated with cereals constitute the largest majority of afforested agricultural areas.

Grasslands amount to 2,962 ha, i.e. 8.3% of the total afforested area. These areas mainly belong to local communities and municipalities. Black locust is the most popular forest species in this case. Pure black locust plantations cover 19,675 ha, i.e. 54.9 % of the total afforested area (Table 1). This forest species was relatively unknown, and thus was chosen primarily for dry, arid and abandoned areas. The walnut comes second with 5,049 ha (14%) and the poplar with 4,582 ha (12.7 %). Poplar cultivation has been a familiar choice with farmers and non-farmers since the 1950s. Walnut also seems to constitute a very important alternative, since it combines the production of fruit and valuable wood.

Table 1. *The main forest species established under the framework of Regulation EC/2080/92*

Forest species	Number of applications	Area (ha)
Conifers (Pine, Fir etc.)	771	708
Black locust	6,080	19,675
Poplar	3,676	4,582
Walnut	3,119	5,049
Chestnut	1,998	1,974

Source: Ministry of Agriculture, 2003

Most afforested areas are located in Eastern Macedonia and Thrace amounting to 16,620.3 ha, i.e. 46.4% of the total afforested area. Central Macedonia comes second with 7,131 ha (19.9%) and Thessaly with 4,290.6 ha (12%). The last is the region of Attica with 2.4 ha.

We thus observe that the largest areas with forest plantations have been established in Northern Greece. It is likely that the long tradition of cultivating forest species (mainly poplar, and fir to a lesser degree) has had an effect on the region..

Within the framework of regulation 1257/99 article 31, 1,414 applications were approved by 31/12/2002. The area that corresponds to that number of applications amounts to 2,301.5 ha and the eligible costs are 24.06 million Euros (Ministry of Agriculture 2003).

The afforested agricultural land is 2,215.7 ha, i.e. 96.3 % of the total afforested area, of which 96% was arid land and annual crops, and 4% were vineyards and fruit trees. We thus observe that within the framework of this regulation, owners of agricultural land do not often choose to give up the cultivation of fruit trees (peach, apple, cherry e.t.c.) in favour of forest plantations. On the contrary, areas cultivated with cereals and medic constitute the vast majority of afforested agricultural areas.

Grasslands cover 56.5 ha, i.e. 2.5% of the total afforested area. Black locust is the forest species mainly planted. Pure black locust plantations cover 1,027 ha, i.e. 45.8 % of the total afforested area (Table 2). The mulberry comes second with 377.5 ha (16.8%) and the walnut with 253.2 ha (11.2%). Mulberry cultivation has mainly been developed in the prefecture of Evros, where coordinated efforts are being made to revive sericulture for which mulberry leaves serve as a basic raw material (Andreopoulou et al, 2005).

Most of the afforested land amounting to 978.1 ha, i.e.

Table 2. *The main forest species established under the framework of Regulation EC/1257/99*

Forest species	Number of applications	Area (ha)
Black locust	519	1,027
Mulberry	104	377.5
Walnut	182	253.2
Chestnut	150	119.2

Source: Ministry of Agriculture, 2003

44.1% of the total afforested area, is located in Eastern Macedonia and Thrace, followed by Thessaly with 572 ha (25.8%) and Central Macedonia with 215 ha (9.7%). No forest plantations were

established in Attica, the Ionian Islands and the Southern Aegean under the framework of regulation 1257/99.

## 5. Conclusions - Proposals

The reforestation programmes implemented in Greece in public areas from the early 50s until the present, and the application of afforestation programmes on agricultural land until the early 90s, brought about very poor results, which only contributed minimally towards an increase in wood production.

The implementation of Regulations 2080/92 and 1257/99 article 31 provided a major impetus for the acceleration of agricultural land afforestation, since they radically transformed the subsidies, incentives and in general the terms of intervention observed by previous European Regulations.

As presented in the aforementioned analysis, significant spatial changes took place during the implementation of the Regulations. In Northern Greece and Thessaly, the total area of established forest species was greater in comparison with the other regions of the country. The vast majority of agricultural areas where forest plantations were established had been used during the previous year for annual crops (wheat, maize). In the plains we have a predominance of the poplar, while in semi-mountainous and mountainous regions, which are arid and/or deserted, the main cultivation is black locust. The poplar is a very broadly disseminated species in Greece, particularly in the North from the 1950s onwards, and therefore most land owners/farmers are well aware of the care and attention that its cultivation requires.

Measures through which a greater acceptance of forest plantations can be achieved, as an alternative use and also as a better way to exploit agricultural land are the following:

1. The financial incentives provided through the Regulations should be reinforced, since an increase in subsidies will give the opportunity to a large number of farmers to abandon surplus crops and establish forest plantations. In this way, within the framework of the restructuring of agricultural production, forest plantations can offer a solution to the impasse caused by the over-production of agricultural goods.
2. The relevant documents required for incorporation under the regulation should be simplified, so that the greatest possible number of applications can be approved.
3. It has been observed that large areas exist in Greece in the plains and irrigated areas with black locust plantations, which is a species that is tolerant to drought. We believe that incentives should be provided so that forest species are selected based on the suitability of the soil.
4. Furthermore, we noted a preference of land owners/farmers to specific forest species. It would be advisable for the competent authorities to provide relevant information and added incentives so that other forest species are also established such as wild cherry.
5. The mixed farms (agricultural cultivations and forest plantations), which are created under the European Reg-

ulations, ought to receive technical and organizational support by the competent authorities, since they constitute the first substantial effort to transform the existing agricultural production system in Greece and adapt it to the new state of affairs.

6. A balance should be maintained between mountain agriculture, mountain livestock and forestry, so that the best exploitation of the available resources is ensured.
7. For the land use planning, particularly in relation to mountainous areas, a broad scale of technical, socio-economic, cultural and political data should be taken into account. This will maximize the production of goods and services, while providing the best possible protection for the environment and safeguarding the social and cultural values of each prefecture.

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