

Tobacco alternatives in Greece. A preliminary evaluation and classification

BASIL MANOS*, THOMAS BOURNARIS*, PARTHENA CHATZINIKOLAOU*,
MARIA TERZI*, FAIDRA KIOMOURTZI*

Jel classification: Q130, Q180

1. Introduction

In 2003-2004, the European Union (EU) introduced direct payments to EU farmers solely based on historical payments. The direct payments, to be implemented between 2005 and 2007 at the discretion of the member states, greatly enhance ongoing reforms of the EU's Common Agricultural Policy (CAP). Such payments, by being up to 100 percent decoupled from current production, allow farmers to make production decisions based more on market signals than policy interventions.

Following the decoupling of the subsidies of this reform, the producer receives a part of the subsidies (e.g. 60%) obtained during the reference period as a fixed payment and the rest (e.g. 40%) as area payment. The concept of decoupling has become one of the key issues in agricultural policy design. Several definitions have been put forward, all of them to the extent of the production effects of farm support. In particular, a policy scheme is defined as fully decoupled if it does not influence production decisions of farmers receiving payments and that it permits free market determination of prices. Finally, a policy scheme is defined as partial decoupling if it results in production that exceeds the level that would exist without it but does not exceed the level that would exist if the scheme was fully coupled to

Abstract

The CAP reform for the tobacco sector has the aim to phase out the subsidy payment for tobacco cultivation. From 2006 to 2009, a decoupled payment is provided in the framework of the Single Farm Payment Scheme. This will have great impacts on the tobacco farmers in terms of income and employment.

This study is aimed at identifying tobacco alternatives in Greece, which can provide tobacco farmers with employment and income. Such alternatives have been evaluated and classified according to different criteria and this led to the drafting of a list of alternative crops being the most suitable for every region concerns.

To this end, we studied two tobacco regions in Greece, the region of the Tobacco Cooperative of Ellassona, in Larissa, Thessaly, and the region of Tobacco Cooperative of Toumpa, in Kilkis, Central Macedonia.

The study was elaborated in the context of the research project entitled DIVTOB (Manos *et al.*), which is a European FP6 funded project under Priority 8 - Policy related research - Tools and assessment methods for sustainable agriculture and forestry management.

Résumé

*La réforme de la PAC pour le secteur du tabac a le but ultime de supprimer progressivement le paiement de subventions à la production de tabac. Entre l'an 2006 et l'an 2009, le découplage des paiements sera introduit dans le cadre du Paiement Unique par Exploitation. Ce nouveau régime de paiement aura un impact significatif sur les revenus et l'emploi des producteurs de tabac. Cette étude vise à identifier les alternatives à la culture du tabac en Grèce qui pourraient devenir une nouvelle source d'emploi et de revenus pour les producteurs de tabac. Ces alternatives ont été évaluées et classées sur la base de différents critères et ceci nous a permis de rédiger une liste des meilleures cultures alternatives pour satisfaire les besoins de chaque région. C'est donc dans ce but ultime que nous avons étudié deux régions grecques de production de tabac: Ellassona, à Larissa, Thessalie, et Toumpa, à Kilkis, Macédoine centrale. Cette étude a été menée dans le cadre du projet de recherche DIVTOB (Manos *et al.*), concernant la 8^{ème} priorité thématique du 6^{ème} Programme-cadre – recherche appliquée à la politique – Instruments et méthodes d'évaluation pour l'agriculture durable et la gestion des forêts.*

production (Cahill, 1997; Semos, 2004). In order to receive this area payment, the producer does not need to harvest; the only requirement is to reach the open capsule stage. This requirement would make more profitable for most producers to almost abandon their tobacco production, which would involve a drastic reduction in input usage (fertilizers, pesticides and irrigation water) and no harvest (Arriaza, 2006).

This can have a great impact on the tobacco growers in terms of income and employment. To avoid the negative impacts, we should identify a set of tobacco alternatives that could provide tobacco farmers with employment and income and then we should evaluate and classify them according to different simple criteria alternatives.

Our study identified different tobacco alternatives that resulted from field research in two areas in Greece: Ellassona, in Larisa prefecture, Thessaly, where the Agricultural Cooperative of Cigars is located, and Toumpa, in Kilkis prefecture, Central Macedonia, where the Tobacco Cooperative is located. We collected necessary data from these two cooperatives using a questionnaire. Extra data were taken from publications of the Ministry of Agriculture and the Department of Agricultural Economics of the Aristotle University of Thessaloniki. The concentrated data were used to estimate the technical and economic coefficients of the tobacco alternatives in the two study regions.

* Aristotle University of Thessaloniki, Department of Agricultural Economics, Thessaloniki, Greece.

On the basis of these coefficients, we also did a preliminary evaluation and classification of the tobacco alternatives using different simple criteria, namely income (gross return), gross margin, variable costs and labour requirements in 2005 - 2006. Even though more complete and effective criteria, such as profit and total costs, are not taken into account, the results of this evaluation and classification show which are the best alternatives to advise farmers as substitutes of tobacco and/or other existing crops.

2. Tobacco alternatives in Ellassona

Tobacco alternatives in Ellassona can be subdivided into three different categories:

1) Aromatic and medical crops (oregano, mountain tea, basil, non irrigated mint, irrigated mint);

2) Energy crops (sunflower, sugar beet, oilseed rape, anise);

3) Organic crops (wheat, durum wheat, barley, maize, alfalfa, and vetch).

Furthermore, another alternative to tobacco in Ellassona is a new crop, called stevia. This crop is at experimental phase in Greece and so prices reported in this document report are only indicative.

The technical and economic coefficients of tobacco and alternative crops are shown in Table 1. Their classification is presented in Table 2.

As far as aromatic and medical crops are concerned, we estimate that mountain tea has the highest income, followed by basil, oregano, irrigated mint and non irrigated mint. Also, mountain tea has the highest gross margin, followed by oregano, irrigated mint, non irrigated mint and basil.

Differences in these two cases are explained by their variable, which are low for non irrigated mint and high for basil. So, even if some crops give a high income, they may have high variable costs, that is why their gross margin becomes low. Furthermore, non irrigated mint has the lowest labour requirements, followed by irrigated mint, oregano, mountain tea and basil, requiring a lot of work. Also, the income average for these crops is 8,740 euros/ha, mountain tea's income is 5,060 euros/ha higher than the average, and

non irrigated mints' income is 3,800 euros/ha lower than the average.

Comparing tobacco's technical and economic coefficients (Table 1) with these crops, it is obvious that mountain tea and oregano are much more profitable than tobacco (oregano's gross margin is 4,507 euros/ha higher than tobacco's and mountain tea's gross margin is 6,517 euros/ha higher than tobacco's), followed by irrigated mint and non irrigated mint. Even though results show that aromatic and medical crops precede, these crops can not be cultivated in big areas as it is by contrast the case of tobacco.

As far as energy crops are concerned, we estimate that sugar beet presents the highest income, followed by anise, sunflower and oilseed rape. On the basis of their gross margin, it is obvious that anise presents its highest value, followed by sugar beet, oilseed rape and sunflower.

Sugar beet and anise have higher variable costs than oilseed rape and sunflower, but all these crops have lower variable costs than tobacco. More analytically, variable costs of sugar beet, the highest of this category, are equal to 1,779 euros/ha and tobacco's variable costs are 7,232 euros/ha. This means that variable costs of sugar beet are only 24.6% of tobacco's variable costs.

Moreover, oilseed rape has the lowest labour requirements for this category, followed by sunflower, sugar beet and anise which require the same work. Also, the income average for these crops is 1,560.8 euros/ha, sugar beet's income is 839.2 euros/ha higher than the average and oilseed rape's income is 795.8 euros/ha lower than the average.

Comparing tobacco's technical and economic coefficients (Table 1) with these crops, we can estimate that tobacco is more profitable than these alternatives. Furthermore, energy crops need proportional infrastructure, which are not still enough in Greece.

As mentioned before, organic crops are the third category of tobacco alternatives in Ellassona. On the basis of their income, we can estimate that alfalfa has the highest income, followed by maize, vetch, barley, wheat and finally durum wheat. As for their gross margin, maize has the highest gross margin, followed by alfalfa, vetch, barley, wheat and durum wheat.

Table 1 – Technical and economic coefficients of tobacco and tobacco alternatives in Ellassona (2005 - 2006).

| Tobacco | Aromatic and Medical crops | | | | | Energy crops | | | | Organic crops | | | | | | Stevia (2006) |
|---------------------------------------|----------------------------|--------------|-----------|--------------------|----------------|--------------|------------|--------------|----------|---------------|-------------|--------|----------|----------|---------|---------------|
| | Oregano | Mountain tea | Basil | Non irrigated mint | Irrigated mint | Sunflower | Sugar beet | Oilseed rape | Anise | Wheat | Durum wheat | Barley | Maize | Alfalfa | Vetch | |
| Prices perceived by farmers (Euro/kg) | | | | | | | | | | | | | | | | |
| 1.3 | 5 | 6 | 3 | 0.26 | 0.26 | 0.18 | 0.04 | 0.24 | 2.27 | 0.21 | 0.24 | 0.18 | 0.22 | 0.03 | 0.24 | 3.00 |
| Yield (kg/ha) | | | | | | | | | | | | | | | | |
| 2,500 | 1,800 | 2,300 | 4,370 | 11,000 | 19,000 | 3,000 | 60,000 | 3,000 | 1,000 | 1,659 | 1,260 | 2,100 | 7,700 | 70,000 | 4,620 | 4,000 |
| Subsidies (euros/ha) | | | | | | | | | | | | | | | | |
| 2.4 | 0 | 0 | 0 | 0 | 0 | 268.1 | 0 | 45 | 0 | 335 | 335 | 335 | 600 | 600 | 335 | 0 |
| Income (euros/ha) | | | | | | | | | | | | | | | | |
| 9,250 | 9,000 | 13,800 | 13,110 | 2,860 | 4,940 | 808.1 | 2,400 | 765 | 2,270 | 683.39 | 634.88 | 717.2 | 2324.8 | 2560 | 1434.56 | 12,000 |
| Variable costs (euros/ha) | | | | | | | | | | | | | | | | |
| 7,232 | 2,475.00 | 5,265.00 | 11,895.70 | 641.6 | 1,106.40 | 650.8 | 1,779.00 | 351 | 1,499.70 | 166 | 166 | 158 | 1,015.20 | 1,263.50 | 353.1 | 7,210 |
| Current gross margin (euros/ha) | | | | | | | | | | | | | | | | |
| 2,018 | 6,525 | 8,535 | 1,215 | 2,218 | 3,834 | 157.3 | 621 | 414 | 770 | 517 | 469 | 559 | 1,310 | 1,297 | 1,081 | 4,790 |
| Labour (hours/ha) | | | | | | | | | | | | | | | | |
| 2,150 | 320 | 1,425 | 2,380 | 120 | 300 | 200 | 330 | 65 | 330 | 35 | 35 | 35 | 240 | 250 | 73 | 1,074 |

As it is obvious maize and alfalfa are the organic crops with the highest income and gross margin. On the contrary, their variable costs are high and they have more labour requirements than the other alternatives of this category. More analytically, barley, wheat and durum wheat have the lowest variable costs, followed by vetch, alfalfa and maize. Barley, wheat and durum wheat have the fewest labour requirements, followed by vetch, maize and alfalfa.

The gross margin average for these crops is 872.2 euros/ha, maize's gross margin is 437.8 euros/ha higher than the average and durum wheat's gross margin is 403.2 euros/ha lower than the average.

Comparing tobacco's technical and economic coefficients (Table 1) with these crops, we can estimate that tobacco is more profitable than these alternatives.

Finally, the last alternative for tobacco in Ellassona is represented by stevia. In 2006, stevia's income was 12,000 euros/ha and gross margin was 4,790 euros/ha. It is obvious

a classification (Table 2) of all tobacco alternatives in Ellassona together, which is very useful for farmers.

Farmers in Ellassona can substitute the existing crops with some of these alternatives, depending on their needs. They have already cultivated some energy crops, but they are in an experimental stage. They have also been cultivating oilseed rape for three years. Moreover, they cultivate sunflower, anise, oregano and stevia with the help and consultation of the University of Thessaly and of the University of Hohenheim. As far as organic crops are concerned, efforts are being made.

In any case, as already shown, the most profitable alternatives for Ellassona, even more profitable than tobacco, are mountain tea, oregano, irrigated mint, stevia and non irrigated mint. Also, all alternatives, with the exception of basil, have lower variable costs and fewer labour requirements than tobacco. However, this report does not take into account more sufficient and effective criteria, such profit and total cost.

Finally, attention must be paid to the fact that aromatic and medical crops cannot be cultivated in big areas and that energy crops need proportional infrastructure, which is not still adequate to cover the possible great increase of the cultivated areas.

3. Tobacco Alternatives in Toumpa

Tobacco alternatives in Toumpa are separated in four categories:

- 1) Aromatic and medical crops (non irrigated oregano, irrigated oregano, non irrigated mountain tea, irrigated mountain tea, basil, non irrigated thyme, irrigated thyme, mint, lavender, camomile);
- 2) Energy crops (sunflower, sugar beet, oilseed rape, anise);
- 3) Organic crops (wheat, durum wheat, barley, maize, alfalfa, vetch);
- 4) Fruit trees (cherries, plums, pears, pomegranates).

Furthermore, another alternative crop for tobacco in Toumpa is the already mentioned stevia. We underline once more that this crop is at experimental stage in Greece and therefore its prices in this report are only an indication.

The technical and economic coefficients of tobacco and alternative crops in Toumpa are shown in Table 3. Their classification is presented in Table 4.

Table 2 – Classification of all tobacco alternatives in Ellassona according to different criteria.

| Tobacco alternatives in Ellassona region | | | |
|--|--------------------|-----------------------|-------------------------------|
| Income | Gross Margin | Variable costs | Labour requirements |
| Mountainous tea | Mountainous tea | Barley | Wheat, durum wheat and barley |
| Basil | Oregano | Wheat and durum wheat | |
| Stevia | Stevia | | |
| Oregano | Irrigated mint | Oilseed rape | Oilseed rape |
| Irrigated mint | Non irrigated mint | Vetch | Vetch |
| Non irrigated mint | Maize | Non irrigated mint | Non irrigated mint |
| Alfalfa | Alfalfa | Sunflower | Sunflower |
| Sugar beet | Basil | Maize | Maize |
| Maize | Vetch | Irrigated mint | Alfalfa |
| Anise | Anise | Alfalfa | Irrigated mint |
| Vetch | Sugar beet | Anise | Oregano |
| Sunflower | Barley | Sugar beet | Sugar beet and anise |
| Oilseed rape | Wheat | Oregano | |
| Barley | Durum wheat | Mountain tea | Stevia |
| Wheat | Oilseed rape | Stevia | Mountain tea |
| Durum wheat | Sunflower | Basil | Basil |

Ranking: Income and Gross Margin: high to low, Variable costs and Labour requirements: low to high

that this crop is more profitable than tobacco and also stevia's labour requirements are almost 42 % of tobacco's requirements.

So far, this was an evaluation and a classification of each category of tobacco alternatives separately. Below, there is

Table 3 – Technical and economic coefficients of tobacco and tobacco alternatives in Toumpa (2005 - 2006).

| Tobacco | Aromatic and medical crops | | | | | | | | | | Energy crops | | | Organic crops | | | | | Fruit trees | | | | Stevia (2006) | | |
|--|----------------------------|-------------------|----------------------------|------------------------|--------|---------------------|-----------------|--------|----------|----------|--------------|-------------|--------------|---------------|-------|-------------|--------|-------|-------------|-------|----------|--------|---------------|--------|--------------|
| | Non irrigated oregano | Irrigated oregano | Non irrigated mountain tea | Irrigated Mountain tea | Basil | Non irrigated thyme | Irrigated thyme | Mint | Lavender | Camomile | Sunflower | Sugar beets | Oilseed rape | Anise | Wheat | Durum Wheat | Barley | Maize | Alfalfa | Vetch | Cherries | Plums | | Pears | Pomegranates |
| Prices perceived by farmers (euros/kg) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.99 | 2.3 | 1 | 0 | 0 | 0 | 1.70 | 1.30 | 0.5 | 4 | 0 | 0.15 | 0.04 | 0.27 | 1.5 | 0.21 | 0.21 | 0.21 | 0.21 | 0.09 | 0.34 | 1.8 | 0.5 | 0.82 | 1.2 | 3.00 |
| Yield (kg/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2,150 | 3,200 | 2,500 | 1,000 | 1,500 | 11,000 | 1,400 | 3,920 | 4,600 | 2,180 | 6,000 | 2,200 | 60,000 | 2,300 | 1,000 | 2,700 | 2,325 | 3,225 | 8,050 | 87,200 | 6,600 | 10,000 | 21,000 | 30,000 | 25,000 | 4,000 |
| Subsidies (euros/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135.0 | 0 | 45 | 0 | 315 | 315 | 315 | 600 | 600 | 315 | 0 | 0 | 0 | 0 | 0 |
| Income (euros/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10,471 | 3,000 | 2,500 | 6,000 | 9,000 | 33,000 | 2,464 | 3,379 | 20,980 | 8,720 | 18,000 | 485 | 2,400 | 606 | 1,500 | 899 | 818 | 1,005 | 2,270 | 3,216 | 1,985 | 20,880 | 10,050 | 22,520 | 30,000 | 12,000 |
| Variable costs (euros/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8,313 | 3,365 | 1,463 | 4,481 | 5,003 | 7,424 | 1,053 | 3,363 | 33,380 | 4,320 | 1,375 | 263 | 1,668 | 151 | 1,220 | 241 | 241 | 219 | 1,240 | 962 | 303 | 6,242 | 4,500 | 6,000 | 12,000 | 7,200 |
| Current gross margin (euros/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2,158 | 6,635 | 1,037 | 1,519 | 3,997 | 25,576 | 1,411 | 3,016 | 17,600 | 4,400 | 16,625 | 222 | 732 | 313 | 280 | 658 | 577 | 786 | 3,030 | 2,276 | 3,512 | 14,538 | 5,550 | 16,520 | 18,000 | 4,790 |
| Labour (hours/ha) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2,350 | 279 | 313 | 1,308 | 1,328 | 2,190 | 213 | 309 | 3,130 | 1,184 | 379 | 63 | 330 | 69 | 330 | 24 | 24 | 24 | 213 | 234 | 84 | 1,000 | 1,120 | 1,300 | 1,120 | 1,074 |

As far as aromatic and medical crops are concerned, we can estimate that basil has the highest income followed by mint, camomile, irrigated mountain tea, lavender, non irrigated mountain tea, irrigated thyme, non irrigated oregano, irrigated oregano and non irrigated thyme. By using as criterion their gross margin, it is obvious that basil has the highest gross margin, followed by mint, camomile, lavender, irrigated mountain tea, irrigated thyme, non irrigated oregano, non irrigated mountain tea, non irrigated thyme and irrigated oregano.

Non irrigated thyme has the lowest variable costs of this category, followed by non irrigated oregano, irrigated thyme, camomile, irrigated oregano, lavender, non irrigated mountain tea, irrigated mountain tea, basil and mint, which has very high variable costs. Moreover, all these crops, with the exception of mint, have lower variable costs than tobacco.

Moreover, non irrigated thyme has the lowest labour requirements, followed by non irrigated oregano, irrigated thyme, irrigated oregano, camomile, lavender, non irrigated mountain tea, irrigated mountain tea, basil and mint, which requires a lot of work. Also, the income average for these crops is 11,596.32 euros/ha, basil's income is 21,403.68 euros/ha higher than the average and non irrigated thyme's income is 9,132.32 euros/ha lower than the average.

Comparing tobacco's technical and economic coefficients (Table 3) with these crops, it is obvious that basil, mint and camomile are much more profitable than tobacco (basil's gross margin is 23,417 euros/ha higher than tobacco's, mint's gross margin is 17,445 euros/ha higher than tobacco's, camomile's gross margin is 14,449 euros/ha higher than tobacco's), followed by lavender and irrigated mountain tea. Though results show that aromatic and medical crops precede the others, these crops can not be cultivated in big areas like tobacco.

As far as energy crops are concerned, we can estimate that sugar beet has the highest income of this category, followed by anise, oilseed rape and sunflower. Using as criterion their gross margin, it is obvious that sugar beet has the highest gross margin, followed by oilseed rape, anise and sunflower.

Sunflower has the lowest variable costs of this category followed by oilseed rape, anise and sugar beet. Furthermore, sunflower and oilseed rape have the same labour requirements, as it is the case of sugar beet and anise.

Comparing tobacco's technical and economic coefficients (Table 3) with these crops, it is obvious that tobacco is more profitable but all of them have lower variable costs and also fewer labour requirements than tobacco. However, energy crops need proportional infrastructure, which is not still enough in Greece.

The third category of tobacco alternatives in Toumpa, as it was mentioned before, is represented by organic crops. Again, we can estimate that alfalfa has the highest income, followed by maize, vetch, barley, wheat and durum wheat.

Alfalfa has the highest gross margin, followed by vetch, maize, barley, wheat and durum wheat.

Although alfalfa has high variable costs and the highest work requirements, it is obvious that it has the best economic coefficients of this category. Variable costs are lower for barley, a little higher for wheat and durum wheat, followed by vetch, alfalfa and maize.

Wheat, durum wheat and barley require the same work, vetch requires only a few working hours more than them, and there are maize and alfalfa.

Gross margin's average for these crops is 1,134.8 euros/ha, alfalfa's gross margin is 1,117.2 euros/ha higher than the average and durum wheat's gross margin is 557.8 euros/ha lower than the average.

Comparing tobacco's technical and economic coefficients (Table 3) with these crops, we can estimate that only alfalfa is more profitable than tobacco, but all these alternatives have lower variable costs and also fewer labour requirements than tobacco.

The fourth category of the tobacco alternatives in Toumpa is represented by fruit trees. It is obvious that pomegranates have the highest income, followed by pears, cherries and plums. As for the gross margin, the classification is the same.

It is obvious that all these trees are very profitable and specifically much more profitable than tobacco. Tobacco's gross margin is only 12 % of pomegranates' gross margin, 13 % of pears' gross margin, 15 % of cherries' gross margin and 39 % of plums' gross margin. Only pomegranates have higher variable costs than tobacco, but all have fewer labour requirements. More analytically, pomegranates have the highest variable costs, followed by cherries, pears and finally plums. As far as labour is concerned, plums and pomegranates have the lowest labour requirements, followed by pears and cherries.

Finally, the last alternative for tobacco in Toumpa is stevia. In 2006, stevia's income was 12,000 euros/ha and its gross margin 4,790 euros/ha. Again, it is obvious that stevia is a more profitable crop than tobacco. Also, stevia's labour requirements are almost 42 % of tobacco's requirements.

So far, this was an evaluation and classification of each category of the tobacco alternatives. Below there is a classification (Table 4) of all tobacco alternatives in Toumpa together, which is very useful for the farmers under the present conditions.

As previously shown, the most profitable alternatives for the farmers in Toumpa region, being also more profitable than tobacco, are basil, mint, pomegranates, camomile, pears, cherries, plums, lavender, irrigated mountain tea, stevia and alfalfa. All the alternatives, except from mint and pomegranates, have lower variable costs than tobacco and also all the alternatives, except from mint, have fewer labour requirements than tobacco. However, as we mentioned this report does not include more sufficient and effective criteria, like profit and total cost. In any case, Toumpa's climate encourages fruit trees.

Finally, attention must be paid to the fact that aromatic and medical crops can not be cultivated in great areas and that energy crops need proportional infrastructure, which are not still adequate to cover a possible great increase to cultivated area.

Table 4 – Classification of all tobacco alternatives in Toumpa according to different criteria.

| Tobacco alternatives in Toumpa | | | |
|--------------------------------|-------------------------------|----------------------------|-------------------------------|
| Income | Gross margin | Variable costs | Labour requirements |
| Basil | Basil | Barley | Wheat, durum wheat and barley |
| Pomegranates | Mint | Wheat and durum wheat | |
| Mint | Pomegranates | Sunflower | Oilseed rape and sunflower |
| Pears | Camomile | Oilseed rape | |
| Cherries | Pears | Vetch | Non irrigated thyme |
| Camomile | Cherries | Alfalfa | Maize |
| Stevia | Plums | Non irrigated thyme | Alfalfa |
| Plums | Stevia | Anise | Non irrigated oregano |
| Irrigated mountain tea | Lavender | Maize | Irrigated thyme |
| Lavender | Irrigated mountain tea | Non irrigated oregano | Irrigated oregano |
| Irrigated mountain tea | Alfalfa | Irrigated thyme | Sugar beet and Anise |
| Irrigated thyme | Irrigated thyme | Camomile | |
| Alfalfa | Non irrigated oregano | Irrigated oregano | |
| Non irrigated oregano | Mountainous tea not irrigated | Sugar beet | Camomile |
| Irrigated oregano | Vetch | Lavender | Stevia |
| Non irrigated thyme | Non irrigated thyme | Non irrigated mountain tea | Plums and pomegranates |
| Sugar beet | Irrigated oregano | Plums | Lavender |
| Maize | Maize | Irrigated mountain tea | Non irrigated mountain tea |
| Vetch | Barley | Pears | |
| Anise | Sugar beet | Cherries | |
| Barley | Wheat | Stevia | |
| Wheat | Durum wheat | Basil | |
| Durum wheat | Oilseed rape | Mint | |
| Oilseed rape | Anise | Pomegranates | |
| Sunflower | Sunflower | | |

Ranking: Income and Gross margin: high to low. Variable costs and Labour requirements: low to high

4. Conclusions

This study aimed at identifying tobacco alternatives in Greece, which would provide tobacco farmers with employment and income. These alternatives were evaluated and classified according to different simple criteria in order

to eventually draft a list of alternative crops, which are most suitable for every region concerns.

Research focused on two tobacco-growing areas in Greece: Ellassona, in Thessaly, central Greece, where the Agricultural Cooperative of Cigars is located, and Toumpa, in Macedonia, northern Greece, where the Tobacco Cooperative is located. We identified 25 tobacco alternatives in these regions which can be subdivided into four categories: 1) aromatic and medical crops, 2) energy crops, 3) organic crops, and 4) fruit trees. Also, another alternative for tobacco is a new crop, called stevia, which is still at an experimental stage.

We concluded that the most profitable alternatives in Ellassona are the aromatic and medical crops and stevia. However, attention must be paid to the fact that aromatic and medical crops cannot be cultivated in big areas because of the marketing channels deficiency and that stevia is still at an experimental stage. As far as Toumpa is concerned, the most profitable alternatives for farmers seem to be represented by fruit trees and aromatic plants that are particularly favoured by Toumpa's climate.

References

- Arriaza, M., & Gomez-Limon, A.J., 2006. *How decoupling could mean dismantling of the cotton sector in Spain*, NEW MEDIT N.1, 4-14.
- Cahill, S.A., 1997. *Calculating the rate of decoupling for crops under CAP/oilseeds reform*, Journal of Agricultural Economics, (48) 349-78.
- Manos, B., Bournaris Th., Chatzinikolaou P., Terzi M., Kiomourtzi F., 2007. *Tobacco alternatives in Greece, Divtob project: Diversification for Tobacco Growing Regions in the Southern European Union*, Divtob working paper.
- Semos A., 2004. *Rural Policy*, Publications Ziti, Thessaloniki (in Greek).