

SuperGREENLABELFoods

“Educational offer in Medicinal Aromatic Plants in Spain, Italy and Greece”

Erasmus+ : KA2 - Cooperation for innovation and the exchange of good practices - Strategic Partnerships | Vocational education & Training

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PROJECT CONSORTIUM

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www.feuga.es

UAGN - Union de Agricultores y Ganaderos de Navarra - Spain

www.uagn.es

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Introduction

Medicinal and aromatic plants play a significant role in meeting the needs of the traditional medicine which, are found both in domestic and overseas markets. According to the OECD's *Guide to the European Market for Medicinal Plants and Extracts*, the European market already was the world's largest single commercial market for MAPs in 2000. It also notices that this market represented more than 7,5 billion dollars that year in terms of sales of herbal remedies, food supplements and functional food all together.

In the terms of the first intellectual output (IO1) of the project superGREENLABELfoods come up this general report which includes the educational offer in MAPs in Italy, Spain and Greece. Especially, one for each participating country, providing the educational offer (formal and vocational training) and the projects/ professional training programs in super foods and medicinal-aromatic plants.

1.1 Educational offer in MAPs in Spain

1.1.1 Formal education

The offer of specific training and qualification in agriculture of SFs and MAPs, destined to growers and producers is scarce and is not specifically intended for producers of these species.

In general research, there are no specific university degrees or college-level training courses in herbal subjects. What we can find is some master's degree or course in a concept of an elective subject. The ultimate aim of these masters or subjects is not, however, the formation of these species in crops, but they always present a theoretical perspective on different aspects of these species:

- Master of applied vegetable biology (MBVA). Faculty of biology. Complutense University of Madrid (**UCM**): Medicinal, aromatic, spicy and food plants
- Inter-university master's degree from the Autonomous University of Barcelona (**UAB**) and the University of Barcelona (**UB**), in collaboration with the **College of Pharmacists of Barcelona**: Master's and a postgraduate diploma in medicinal plants and phytotherapy.
- University Master from Miguel Hernandez University (**UMH**): Master's degree in Agroecology, Rural Development, and Agro-tourism.
- Open courseware. Polytechnic University of Madrid (**UPM**). Industrial Use of Aromatic and Medicinal Plants
- Elective subject. Polytechnic School of Engineering. University of Santiago de Compostela (**USC**): 811583 - Medicinal and Aromatic Plants

Several masters are promoted in relation to aromatic and medicinal plants but always linked to nutrition, homeopathy, aromatherapy, phytotherapy, alternative medicines...

and therefore aimed at pharmacists, doctors, nurses and other graduates in health sciences, herbalist operators, etc., but not for agriculturists.

At the level of specific training courses, the educational offer in medicinal and aromatics plants is insufficient and does not cover the level of information that should be available to encompass such a diverse and complex sector as MAPs.

1.1.2 Vocational training

The Spanish National Institute of Employment (**INEM**), deliver a modular **course on Medicinal and Aromatics Plants**. The objectives of the course are:

- To acquire specific knowledge about the uses and applications of Aromatic and Medicinal Plants.
- To establish different practices related to use and application of MAPS
- To know the different cultivation techniques, collection, and manipulation of medicinal aromatic plants.
- To bring participants closer to new technologies. Raise awareness of the environment and the vital importance of being respectful of it.
- To introduce members of the sector to the fundamental knowledge and concepts of the environment.

The course program is divided into 6 modules that complete a total of 40 hours of training:

- Module I: Introduction to botanic (2h)
- Module II: The medicinal plants (10h)
- Module III: The cultivation and its techniques (6h)
- Module IV: The gathering (6h)
- Module V: Manipulation Techniques (10h)
- Module VI: Phytotherapy (6h)

With the same dynamic vocational training, **INEM** organizes the training programme: Producer of aromatic and medicinal plants. The main goal of this programme is *“develop and execute, under direct supervision, the tasks necessary to complete the process of production of different species and varieties of aromatic and medicinal plants, preparing the soil, watering and fertilizing, carrying out cultural activities and controlling the phytosanitary status of crops”*

This program is divided into 3 modules that complete a total of 170 hours of training:

- Module I: Soil preparation (50h)
- Module II: Irrigation and fertilization (45h)
- Module III: Cultural practice (45h)
- Module IV: Phytosanitary control (30h)

Subsidized by the **Ministry of Employment and Social Security and the European Social Fund**, a training programme was set up. Aromatic and medicinal plants: main techniques

cultivation, harvesting, and handling. The main goal of this programme is: *"To acquire the fundamentals on the botany of some of the most interesting aromatic medicinal species, their uses, and their main applications, by raising different cultivation, harvesting and handling techniques"*

The training content is divided into 5 main blocks or themes that add up to a total of 40 hours of training:

- 1. Introduction to plants and phytotherapy
- 2. The medicinal plants
- 3. Cultivation and techniques
- 4. The gathering
- 5. Handling techniques
- 6. Phytotherapy

1.1.3 Initiatives of Agricultural associations, Technologic Centers, and other Regional Organism.

The work in training offered by the **Spanish Association of Organic Farming (SEAE)** is remarkable. Among his courses we highlight the following calls:

- Online courses of Introduction to the organic production of aromatic and medicinal plants (PAM). Andalucía, Castilla La Mancha and Murcia (February-April 2018). Online courses (60h).
- Advanced Organic Production of Aromatic and Medicinal Plants. Online courses (50h). This course is also aimed at residents of Andalucía, Castilla la Mancha, and Murcia (April-May 2018).

These courses are developed within the framework of the AgroecolInnova project - Agroecological training, for rural employment of the Employee Programme of the Biodiversity Foundation of the Ministry of Agriculture and Fisheries, Food and Environment (MAPAMA), with co-financing from the European Social Fund (ESF).

There is also a continuous offer of training courses in the cultivation of MAPs that arise are promoted from the **National Inter-professional Association of Aromatic and Medicinal Plants (ANIPAM).**

- During the first quarter of 2018, they have promoted promotional workshops offered by the Provincial Directorate of Agriculture, Environment and Rural Development of Guadalajara (Junta de Comunidades de Castilla La Mancha). They are 7h sessions where three key points are discussed: technical aspects of the cultivation of MAPs, local and regional aids, and subsidies and producer perspectives.
- At the end of 2017, ANIPAM promoted a meeting to bring together producers, suppliers, distributors, researchers and public bodies to encourage collaboration in the areas of aromatic plants and other crops of nutritional value. This conference was organized by FUNDECYPTCTEX as part of the AGROPOL project. fundecyt-pctex.es; AGROPOL

It should be noted, however, that at the regional level, different Catalan regions are very active in terms of trainings addressed to the MAPs production. The data presented below are data obtained in the Herbatis project (discussed in a later section):

- *In 2015 in Catalonia, at least **51 occasional trainings in relation to MAPs production.***
- *About the 51 trainings, 25 were addressed to amateur audience and 26 to professionals. Just 7 can be considered formal trainings, organized 5 by High Educational Centres and 2 by VET Centres.*
- *Out of 51 trainings 19 courses had duration of several days, 14 were seminars, 9 practical workshops and 9 botanical hikes. It seems that they were isolated initiatives without coordination among them.*

This underlines the importance in improving the network and the high quality learning opportunities for MAPs producers in order to face the different aspects of herbal production (production, transformation, safety aspects, norms and procedures, marketing, etc.).

1.1.4 Projects: professional training programs in MAPs.

It is worth highlighting the approach and results obtained from two projects carried out under the Erasmus + programme, which are briefly discussed below:

- **Herbal-Mednet** - Enhancing the Vocational Education and Training of Innovative Farming Trainers/Advisors in Area of Herbal, Medicinal, and Aromatic Plants. Education and training\Lifelong learning (2007-2013)\LEONARDO DA VINCI\Multilateral projects on Innovation. Erasmus+. Herbal-Mednet
Coordinator: **Spanish Association of Organic Farming (SEAE)**

This project covered the following objectives: " Identifying and analyzing targeted needs and competences in order to prepare a set of highly-qualified agricultural advisors and extension officers, who can serve as trainers in adopting and applying organic herbal cultivations and producers/processors of extracts from medicinal and aromatic plants in Mediterranean countries; developing a training program that will particularly enhance and address the targeted competences for the advisors of organic herbs farmers and processors as well as specific case studies that apply for the specificities of the participating Mediterranean countries, Spain, Italy and Greece"

- **Herbatis**-Adult training on handicraft production of medicinal and aromatic plants. Strategic Partnership for Adult Training 2015-1-ES01-KA204-015718 (2015-2017). Erasmus+ . Herbatis
Coordinator: **Catalan forestry technology center (CTFC)**

The main objective of HERBARTIS project was " *to achieve the professional development of adult learners by developing useful tools and methods, improving the offer of high-*

quality learning opportunities, and validating the non-formal learning and career guidance”.

1.1.5 Other courses

The range of courses that can be found on the internet is not very wide, and is not complete in terms of professional training. Below we highlight the most formative courses in MAPs that we have found online:

Centre	Course	Hours	Type
Study Centre CCC	Herbology and medicinal plants	40h	Online
Study Centre CCC	Herbology, Medicinal Plants, and Phytotherapy		
IFES	Medicinal and Aromatic Plants	40h	Pres
Associaciolera	Living With Aromatic and Medicinal Plants	3 months	Pres
Higher Technological Research Institute	Herbology and Aromatic and Condimentary Medicinal Plants	Flex	Online
CNFO Los realejos	Medicinal-Aromatic Plants Producers	179h	Pres
CNFO	*Several calls		Pres

1.1.6 Training-oriented literature

- MORE, E.; TUGRUL AY, S. 2017. **TRUMAP Best practices for cultivation of medicinal and aromatic plants.**
- LOURENÇO, C.; AUNAC, C.; BAGARRI, O.; CERUTTI, E.; CONTI, A.; RUFFONI, B.; MARCHIONI, I.; CALEVO, J.; MORÉ, E. 2017. **Directrices de metodologías de formación y recomendaciones técnicas para el reconocimiento de la producción artesanal de hierbas.**
- MOLINS F.O.2012. **Plantas aromáticas, medicinales y condimentarias ecológicas, un mercado con futuro.** Revista Ae n9 Ed.SEA. Depósito legal 2052-2010
- MORÉ, E.; FANLO, M.; MELERO, R.; CRISTÓBAL, R. 2010. **Guía para la producción sostenible de plantas aromáticas y medicinales.** Ed. Centre Tecnològic Forestal de Catalunya. pp. 268. ISBN 978-84-693-0106-7
- FANLO, M.; MELERO, R.; MORÉ, E.; CRISTÓBAL, R. 2009. **Cultivo de plantas aromáticas, medicinales y condimentarias en Cataluña. 6 años de campos de demostración.** Ed. Centre Tecnològic Forestal de Catalunya. pp.79, ISBN 978-84-692-2696-4.

- MORÉ, E. 2008. **Estudio de la situación actual del Lavandín Súper y Coriandro. Proyecto de Cooperación Territorial Nuevas Alternativas Agrarias para la provincia de Cuenca.** Ed. Instituto de Desarrollo Comunitario de Cuenca.
- MORÉ, E.; CRISTÓBAL, R.; FANLO, M.; MELERO, R., 2007 **Alternatives productives en l'àmbit agrari: guia de producció de plantes aromàtiques i medicinals.** Ed. Centre Tecnològic Forestal de Catalunya. pp 180, ISBN 978-84-690-4342-4.
- MORÉ, E.; MELERO, R.; CRISTÓBAL, R.; FANLO, M. 2007. **Boletín especial Recolección silvestre de Plantas Aromáticas y Medicinales.** Ed. Centre Tecnològic Forestal de Catalunya. Financia Fundación Biodiversidad.
- CRISTÓBAL, R.; FANLO, M.; MELERO, R.; MORÉ, E.; MUNTANÉ, J. 2006. **Plantas aromàtiques i medicinals.** Dossier Tècnic Formació i Assessorament al sector agroalimentari. Departament d'Agricultura, Ramaderia i Pesca, 13:30pp.
- PAZ ARRAIZA BERMÚDEZ-CAÑETE, M. 2006. **Cultivo ecológico de plantas aromáticas y medicinales.**17pp
- CRISTOBAL Y CABAU R. 2005. **Producción ecológica de plantas aromáticas y medicinales: cultivo y recolección.** En ponencias del libro blanco de la producción agroalimentaria ecológica de Catalunya. Edita Generalitat de Catalunya. Departamento de Agricultura, Alimentación y Acción Rural. 9pp.
- RECANCES J, CRISTÓBAL R. 2003. **El cultiu ecològic de plantes medicinals al Pirineu.** Lo rovell de l'ou.pp37-45

1.2 Educational offer in Italy - Formal education

In Italy, eight universities offer a degree program focusing on MAPs. According to the university it can be called in different ways: Herbal science, herbal techniques or applied pharmaceutical science (with the code [L-29]). The courses generally follow a chain-based approach in order to provide knowledge on the different phases including those related to agronomy and primary production.

Some of these university degrees are:

- **Bachelor's degree in Herbal Sciences and Technologies, University of Milan:** at the end of their studies, the students should be able to assume professional roles in: the transformation of medicinal plants; quality management in the industry; the commercialisation of herbal substances and their derivatives for use in the preparation of herbal, food and cosmetic products, in compliance with the provisions of the national and Community laws currently in force.
- **Bachelor's degree in Herbal Sciences & Technologies, University of Cagliari:** the degree programme should provide the students with the required competencies to harvest, process, package and sell (wholesale or retail) MAPs so that they can be used as herbal medicines. They should also have the necessary knowledge to guarantee the products' quality according to the legislation in force so that they can carry out tasks of

management and control, role of technician for the protection of flora, activities of medicinal plant vigilance, professional activity in herbalists' and pharmacies.

· **Master's degree in Biotechnology for Medicinal and Aromatic Plants - BiotecMAP, University of Bari:** divided in three main modules (namely Tissue culture and micropropagation: Technology and Application; Biopesticides Biopesticides: Application Application and Mechanism Mechanism of Action; Extraction, Purification and Characterization of bioactive bioactive compounds compounds from plants), this degree with a duration of 1500 hours should provide the students with the skills required to pursue

a scientific and/or professional career and with the capacity to write and manage projects for technological development and research in relation with MAPs valorization.

It can be noticed that these courses are not specifically designed for MAPs' producers but above all for the other actors of the supply-chain.

Moreover, in some universities, a course on MAPs cultivation is offered inside the bachelor's degree even if the degree is not specialized in MAPs, for instance:

· **"Colture Officinali (Tecniche Erboristiche)", Univertisy of Torino:** Medicinal cultivation.

This 35 hours long course should allow to get knowledge and skills on the legislative framework, cultivation and harvesting, on the international and Italian contexts, on the Italian supply-chain and market with a focus on the case of Piemonte, on primary and secondary processes and products, on the quality factors influencing the plants' active substances, on the plants' cultivation and seeds' propagation and production and weeds' control.

· **"Medicinal Plants: cultivation and first transformation", University of Sassari:** it is a 56 hours optional course available for the students of the sector of horticulture and floriculture. It provides knowledge on the market, cultivation, active substances, propagation, use, conservation, extraction techniques.

1.2.1 Vocational training

The Agricultural Service of the Autonomous Province of Trento in cooperation with the E. Mach

Foundation offers a training course on cultivation, harvesting and transformation of officinal herbs.

It is a 100 hours long course divided into a theoretical part (66 hours), technical-practical visits (34 hours) and a final verification (2 hours). It is organized as follows:

1. Theoretical part:

1) Introduction, presentation of the Trentinerbe regulation, the regulations of the organic production methods (2 hours)

2) Botanic elements (4 hours)

3) Spontaneous flora: how to recognize it and harvesting techniques (8 hours)

4) The medicinal plants' active substances (4 hours)

5) Cultivation techniques:

a) *General agronomy (4 hours)*

b) *The various species' cultivation techniques (12 hours)*

c) *Post-harvest mechanisation and operations (4 hours)*

- 6) Main odds and defense techniques of the plants in the field according to the principles of integrated and/or organic agriculture (4 hours)
- 7) Normative and hygiene & health aspects (4 hours)
- 8) Transformation, preparation of herbal teas, conservation of the product on the farm (6 hours)
- 9) Normative and technical elements for the realization of cosmetic products, aromatised salts and other derivatives (6 hours)
- 10) Normative aspects concerning the harvest of spontaneous species (2 hours)
- 11) The products' commercialization (2 hours)
- 12) Principles of rural economy and return of medicinal plants cultivation's (4 hours)

Technical-practical part:

1. Cultivation techniques and greenhouse multiplications (2 hours)
2. Cultivation practical tests (8 hours)
3. Excursions designed to recognize spontaneous species and learn harvesting techniques (12 hours)
4. Visit to the production reality in Alto Adige (6 hours)
5. Visit of production and transformation companies in the Province of Trento (6 hours).

Another example is the course organized by the Autonomous Valle d'Aosta Region's Agriculture and Natural Resources Department in collaboration with Progetto Formazione designed to the workers of agricultural and food companies. The course addresses the following subjects:

1. The product categories characteristics of the main medicinal plants and their derivatives and their relevant markets;
2. Help for the medicinal plants' cultivation and transformation according to the regulations in force at the date of the course (L.R. 17/2016 del 03/08/2016); the reality of the medicinal plants' cultivation in Valle d'Aosta.
3. Legge Regionale 16 febbraio 2001, n. 2 – Discipline of the medicinal plants' cultivation, harvesting, first transformation, transformation and commercialization.
4. Reg. CE 178/2002 e Reg. CE 852/2004 – Food hygiene;
5. L. 99 del 1931 and RD n .772/1932 cd Spice shops laws;
6. Food supplements, in particular those made with medicinal plants - implementation Directive 2002/46/CE – plant-based and homeopathic medicines.
7. Food, herbal products, food supplements and medicines' labelling rules.
8. The tax aspects of medicinal plants' cultivation and transformation.
9. Principles of nursery, production, preservation of transplant and implantation techniques.
10. Modality of plant protection products' storage (natural and organic defense products, toxic and harmful chemical substances) according to the new D.LGS.150/2012 on the management of plant protection products.
11. Agronomy elements (notions of climatology, geology, pedology and morphology of the soil, techniques of processing and preparation of soils).
12. Botanical elements and notions of systematic botany related to species of medicinal plants.
13. Techniques of medicinal plants' cultivation; Preservation and preparation for direct sales.

14. Main agricultural production systems: conventional, integrated, organic agriculture.
15. Management of microbial fauna and flora (parasites, chemical/biological/integrated control techniques). The course will take place at least twice a month from 3 to 7pm from November to June.

1.2.2 Initiatives of Agricultural associations, Technologic Centers, and other Regional Organism.

A training is offered by the Italian Federation of MAPs producers (FIPPO) designed for any person who wants to start a business or to improve one's skills in professional MAPs cultivation. It will address the aspects related to the planting and the cultivation technique's correct design and implementation, with a specific focus on the different types of terrain, climate and company structures, always with a particular attention paid to the product's placement on the national and European market. To this training will be added three optional and complementary training days to look into the subject in greater depth. They will respectively be organized as follows:

- Practical and demonstration day and realization of a project.
- Planting, harvesting and processing management.
- Planting, harvesting and processing management.

Excluding these three days (of 8 hours each), the course has a duration of three days and 24 hours.

In addition to these training, FIPPO also organizes a biennial forum to bring together the actors of the sector, update them about the last techniques and innovations etc.

The existing on-line courses about MAPs are not related to their cultivation but to general information about how to use them or their qualities, so they are not designed to producers. There is an exception regarding on-line courses offered by European programs that include a first part online and a second one on the field (such as the Herbatis Project).

1.2.3 Projects: professional training programs in MAPs.

In addition to the European Projects funded through the Erasmus + Programme, some projects including a professional training program in MAPs are also offered in Italy, for instance:

- An interesting example is the **Greenhouse Project** mentored by the Department of Youth and National Civil Service that aims at fostering agricultural entrepreneurship among young people and the cultivation of MAPs on the territory of the Dauni Mounts (a mountainous area in Apulia). It should reach this objective through the dissemination of information on the possibilities, advantages and risks to cultivate medicinal plants in this area; the delivering of funds to young agricultural entrepreneurs who want to start cultivating medicinal plants; a contribution to the professional training of young people with fewer opportunities; funds research in the field of medicinal plants.

<http://www.cgsinopia.it/ilprogetto-greenhouse/>

- The “**Erboff – cultivate and transform medicinal plants**” Project offered by the Center Assistance Companies Coldiretti Tuscany (CAICT) that includes a four days long training about how to cultivate and transform MAPs.
http://www.fippo.org/UserFiles//File/Cal_attivita.pdf

6.5. Other courses

No other relevant course could be found in addition to those presented above.

6.6. Training-oriented literature

Works:

- BIANCO, V. A; MARZI, V.; SARLI, G. 2001. *La biodiversità vegetale del Pollino come opportunità di sviluppo : prospettive di valorizzazione delle specie officinali dell'area : atti del convegno : Cersosimo*, Grafiche Paternoster, 16-17 giugno 2000.
- CRESCIMANNO M. (cur.) 2007. *Le piante officinali in Sicilia - Potenzialità di sviluppo con metodo biologico*, EDIZIONI FOTOGRAF.
- DELLACHA, A.; OLIVERO, G. 2010. *2: Parte applicativa: colture cerealicole, agroindustriali, foraggere e officinali, colture orticole, floreali e ornamentali*, REDA.
- DI MATTIA, E. 1984. *La coltivazione delle piante officinali : studio di massima per l'avviamento di un progetto di sperimentazione nella Valle peligna : valorizzazione e tipicizzazione di colture agricole alternative*.
- GADDA M.; MONTEFINALE D. 2011. *Come avviare un'attività di coltivazione di piante aromatiche e officinali*, Crea Impresa.
- GIANNACCINI B., 2017. *La coltivazione delle piante officinali e da essenza sulle Alpi Apuane. Indagine e proposte di intervento*, Pezzini.
- Istituto sperimentale per l'assessamento. *Convegno sulla coltivazione delle piante officinali: Convegno: Trento, 9-10 ottobre 1986*.
- MASSIH MILESI FERRETTI L.; MILESI FERRETTI G., 2001. *La Coltivazione delle Piante Aromatiche e Medicinali*, Edagricole-New Business Media.
- MONTEFINALE A.; MONTEFINALE D. 2016. *Come avviare una coltivazione di piante aromatiche, officinali e medicinali: Il business delle piante aromatiche: varietà di piante, fasi coltivazione, ... con una coltivazione di piante officinali*, Genesis Edizioni.
- PETRUZZELLA, D. 2008. *Manuale del sistema di gestione del prodotto biologico: filiera erbe officinali*, Associazione di produttori Biol Italia.
- MARZI, V.; DE MASTRO G. 2008. *Piante officinali: coltivazione, trattamenti di post-raccolta, contenuti di principi attivi, impieghi in vari settori industriali ed erboristici*.
- SCOZZOLI, M. *Le piante officinali nella terapia veterinaria*, Adda.
- VOLTOLINA G. 2017. *Piante officinali – Dalla coltivazione alla vendita nell'azienda agricola multifunzionale*, Edizioni L'Informatore Agrario.

Articles and magazines:

- COSSU M., “*Produrre piante officinali in Sardegna*”, *Vita in Campagna*, numero principale n. 12, p.66, 01/12/2000.
- LETO C., SPARTA G. “*Valorizzazione delle officinali in Sicilia*”, *L'Informatore Agrario*, n. 50 Supplemento Sicilia, p.20, 22/12/2006.
- PRIMAVERA A., “*La coltivazione delle erbe officinali in Italia*”, *L'Informatore Agrario*, n. 04, p.67, 28/01/2005.

- PORCU F., MANZO A. “La coltivazione delle officinali puç essere un' opportunità”, *L'Informatore Agrario*, n. 30, p.47, 28/07/2016.
- ROCCABRUNA L., *Guida illustrata alla coltivazione e utilizzazione delle piante aromaticheofficinali*, Vita in Campagna - Guide illustrate 2004, n.10.
- ZECHINI D' AULERIO A., ZAMBONELLI A. “Malattie crittogamiche su piante officinali: diffusione, effetti, difesa”, *L'Informatore Agrario*, n. 01, p.91, 03/01/1997.

1.3 Educational offer in Greece

It is fact that the geographical position of Greece, its geomorphology, the presence of flora of past geological eras and the coexistence and interplay of biotic and non biotic factors have defined it as a region of high plant diversity and endemism, a fact that also impacts the category of medicinal and aromatic plants (Solomou et al.,2016). Furthermore, the Greek flora is rich in native herbaceous plants and the climatic and soil conditions are prevailing with the possibility of their cultivation (Stefanou *et al.*, 2014).

Nowadays, the world is rapidly developing and population demographics are continuously growing. Consequently, the use of natural available resources is a new provocation and it has become a typical approach, where the environment permits it. It is of high priority to do so in areas that have a favorable climatic conditions (Bogers, Craker, & Lange, 2006), and the Greek area is one favorable place where the aromatic plants are an important natural resource (Lange, 2001; Mateescu, Paun, Popescu, Roata, & Sidoroff, 2014,Solomou et al.,2016).

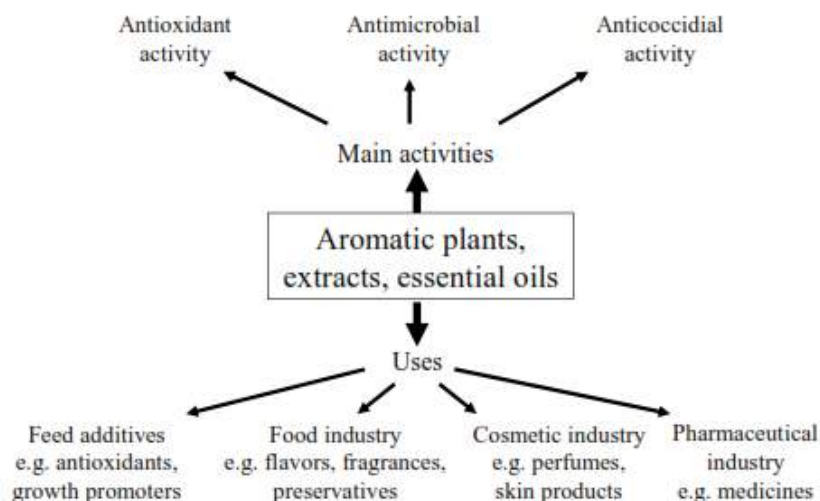


Figure 1: Activities and uses of aromatic plants (Christaki et al., 2012)

Thus, from the literature review raises that medicinal and aromatic plant has a vital role in the utilization of the natural wealth and conservation of biodiversity in the state. Also, due to the selective and multifaceted biological activity of essential oils, there exists considerable potential on the use of aromatic plants for novel applications in sustainable agriculture. As result is very important educational field the use and the implications of medicinal and aromatic plant.

1.3.1 Formal education

The offer of specific training and qualification in agriculture of SFs and MAPs, destined to growers and producers is scared and is not specifically intended for producers of these species.

In general research, there are no specific university degrees or college-level training courses in herbal subjects. What we can find is some master's degree or course in a concept of an elective subject.

Master of applied vegetable biology (MBVA). Faculty of biology. Complutense Aristotle University of Thessaloniki: Medicinal, aromatic plants

And relevance in aromatic and botanic plant in departments of school of agriculture:

- Agricultural University of Athens
- Agricultural School of the Aristotle University of Thessaloniki.
- Department of Rural Development of the Democritus University of Thrace.
- Department of Agricultural Production and Rural Environment of the University of Thessaly

Several masters are promoted in relation to aromatic and medicinal plants but always linked to nutrition, homeopathy, aromatherapy, phytotherapy, alternative medicines and therefore aimed at pharmacists, doctors, nurses and other graduates in health sciences, herbalist operators, etc., but not for agriculturists. At the level of specific training courses, the educational offer in medicinal and aromatics plants is insufficient and does not cover the level of information that should be available to encompass such a diverse and complex sector as MAPs.

1.3.2 Vocational training

The Greece National Institute of Employment deliver a course on Introduction in Aromatic and Medicinal Plants. The objectives of the course are:

- To inform about the uses and applications of Aromatic and Medicinal Plants.
- To establish different practices related to use and application of MAPS
- To know the different cultivation techniques, collection, and manipulation of medicinal aromatic plants.

More specifically the course program is divided into 8 sections that complete a total of 100 hours of training:

- Section1: Introduction to botanic (10h)
- Section2: The medicinal plants (10h)
- Section3: The cultivation and its techniques (20h)
- Section4: The gathering (10h)
- Section5: Manipulation Techniques (10h)
- Section6: Phytotherapy (10h)
- Section7: practice (20h)
- Section8: evaluation (20h)

Below there is the table1 with nine training programs in this research area:

Centre	Title	Duration
Higher Technological Research Institute, T.E.I. of Thessaly	Postgraduate study program entitled: "integrated management of flavoring and pharmaceutical plants	2 years
Greece National Institute of Employment	Introduction in Aromatic and Medicinal Plants	100hours
Technological educational institute of Crete, department of agriculture	Seminars in Medicinal Plants, and Phytotherapy	150hours
Laboratory for Production of Agricultural Products and Propagating Material, TEI of Crete	Course, the use of Aromatic and Medicinal Plants	40hours
Agricultural Research Institute, ELGO, DIMITRA	Green Education and Development: Capitalizing on Of Greek Aromatic and Medicinal Plants in the Cyclades	25 days
American Farm School and the National Center for Research and Technological Development	Medicinal and Aromatic Plants	40 hours

AGRONOMIST.GR	Training in Aromatic and Medicinal Plants	100hours on line
AGRONOMIST.GR	Essential oils: therapeutic properties and their uses. Safe use of essential oils. Essential oil carriers. Properties and uses.	6 hours on line
Lifelong Learning Structure of the Aristotle University of Thessaloniki	Education- Training in the Production of Pharmaceutical Aromatic Plants and Essential Plants Olive Oil	90hours
School of pharmacy A.U.T.H	Seminar specializing in the production of Aromatic Herbs and Essential Plants	103 hours

Table1: courses and educational programs in aromatic and medical plants in Greece

1.3.3 Projects: professional training programs in MAPs.

It is worth highlighting the approach and results obtained from projects carried out under the Erasmus + programme, which are briefly discussed below:

- FEEDMAP schedule "A holistic approach to the sustainable use of domestic aromatic plants for the production of innovative bioactive food products for humans and animals"
- "SEE-MAP" Sustainable Exploitation of European Medicinal and Aromatic Plants,
- Participation to agricultural research institute in act of COST European network for algal- bioproducts (EUALGAE), ES1408

1.3.4 Training-oriented literature (articles and magazines)

- Daugherty, B. (2011). Superfoods: The Healthiest Foods on the Planet. *Journal of Nutrition Education and Behavior*, 43(3), 207.e207. doi:<https://doi.org/10.1016/j.jneb.2011.03.008>

- Dhar, P., Dhar, D. G., Rawat, A. K. S., & Srivastava, S. (2017). Medicinal chemistry and biological potential of *Cyperus rotundus* Linn.: An overview to discover elite chemotype(s) for industrial use. *Industrial Crops and Products*, 108, 232-247. doi:<https://doi.org/10.1016/j.indcrop.2017.05.053>
- Durazzo, A., Camilli, E., D'Addezio, L., Le Donne, C., Ferrari, M., Marconi, S., . . . Turrini, A. (2018). Food Groups and Individual Foods: Nutritional Attributes and Dietary Importance *Reference Module in Food Science*: Elsevier.
- Llorent-Martínez, E. J., Fernández-de Córdoba, M. L., Ortega-Barrales, P., & Ruiz-Medina, A. (2013). Characterization and comparison of the chemical composition of exotic superfoods. *Microchemical Journal*, 110, 444-451. doi:<https://doi.org/10.1016/j.microc.2013.05.016>
- More, e.; Tugrul ay, s. 2017. Trumap best practices for cultivation of medicinal and aromatic plants.
- Singh, D., & Chaudhuri, P. K. (2018). A review on phytochemical and pharmacological properties of Holy basil (*Ocimum sanctum* L.). *Industrial Crops and Products*, 118, 367-382. doi:<https://doi.org/10.1016/j.indcrop.2018.03.048>
- Tangney, C. C., Staffileno, B. A., & Rasmussen, H. E. (2017). Healthy Eating: How Do We Define It and Measure It? What's the Evidence? *The Journal for Nurse Practitioners*, 13(1), e7-e15. doi:<https://doi.org/10.1016/j.nurpra.2016.08.026>
- <https://www.agronomist.gr/>
- <https://www.mistikakipou.gr/votana-aromatika-fita/>
- <https://agrotikes-eykairies.gr/ekpaideusi/item/111-seminario-aromatikon-farmakeytikwn-fytwn.html?gclid=CjwKCAjwxZnYBRAVEiwANMTRX7BVV5ZVYSngwUjz6640cqje17FGEw4XK1qP2ozjeNOkgcdW2DQEIroCLzQQAvD BwE#.VRgQtmsUws>
- <https://www.omicsonline.org/scholarly/aromatic-plants-journals-articles-ppts-list.php>
- <https://aromaticstudies.com/5-great-aromatic-plants-for-the-garden/>
- <https://www.journals.elsevier.com/journal-of-applied-research-on-medicinal-and-aromatic-plants>