



# AgroStrat

Sustainable Strategies for the improvement of seriously degraded agricultural areas:  
The example of *Pistachia vera* L.

25 June 2016

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The Workshop of AgroStrat in Cyprus will be hosted by the 4<sup>th</sup> International Conference on Sustainable Solid Waste Management, 23-25 June, Limassol  
<http://www.cyprus2016.uest.gr>



6<sup>th</sup> Newsletter

## Land Suitability Maps

for distribution of wastewater and solid pistachio waste

GIS maps for Aegina island, Greece, were developed to assist the decision on the suitability of land to accept wastewater and solid pistachio waste. The methodology for land evaluation in categorization into suitability classes was that of FAO.

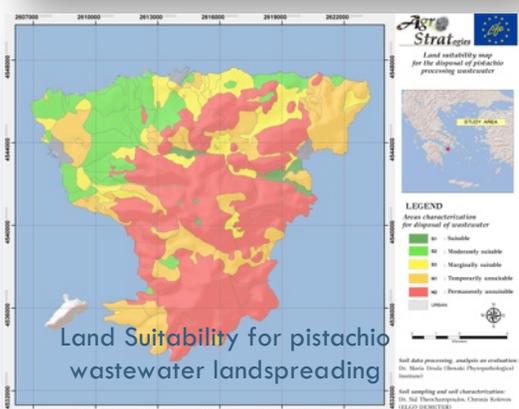
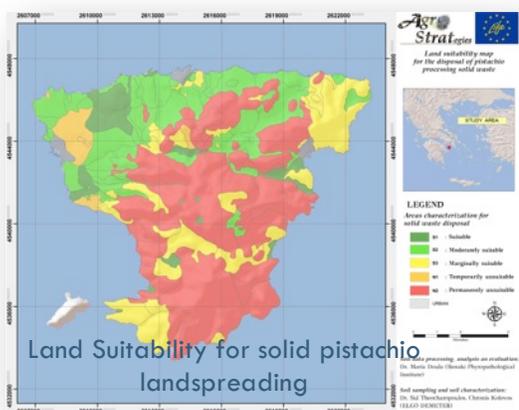
Suitability maps were developed also for each one of the soil parameters that were found to be affected mostly by pistachio wastes.

Maps are included in the Cultivation Management Software to assist decision-making regarding reuse or disposal of pistachio wastes.

**The user defines the exact location of the field, where wastewater or solid wastes are to be disposed.**

**The AgroStrat Software evaluates the area regarding suitability for waste landspreading by using the Suitability Maps, the chemical analysis of soil and wastes and the legislative framework**

**The exact dose of application is then calculated**



The software provides consultancy for waste landspreading considering the legislative framework of different Mediterranean countries, i.e. Greece, Spain, Italy, Malta, Portugal, France and Cyprus. The development of similar Land Suitability Maps at these countries will provide the potential to use the system throughout the Med region

Land Suitability Maps for Aegina Island are available on the web site of AgroStrat  
<http://www.agrostrat.gr/?q=en/node/546>



# The Central Management Monitoring Tool

The Central Management Monitoring Tool (CMMT) of AgroStrat is a unique web GIS-based application that will assist Local and Regional Authorities to monitor soil quality and agricultural practices at local and regional scale.

The Central Management Monitoring Tool supports the establishment of a Monitoring Centre, which could be located, for instance, at the premises of a Regional Service/Agency, farmers' association or of a Municipality and enhances the continuous monitoring of cultivated areas or areas where wastes are disposed.

## Connection with the Monitoring Authority

This unique web application provides the option for the farmers to inform the Monitoring Authority for their field and cultivation status by uploading soil, water and wastes analysis on CMMT Server and may receive additional consultancy afterwards by the scientists of the Authority.

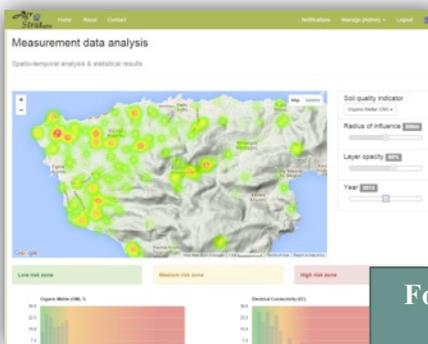


The CMMT enhances authorities to screen cultivated areas rapidly, identify potential risky conditions and proceed to detailed monitoring, if necessary, and implement resources monitoring at field, municipal or regional scale. Farmers can input data regarding soil quality, implemented practices (use of fertilizers, composts, pesticides), irrigation water quality, problems during pistachio production seasons, etc. During this procedures the software collects data and provides certain directives and guidelines at field, local or regional scale.

The cultivated fields or the waste disposal areas are presented on maps. The user may select which soil property wishes to monitor and for which period. The results are presented on the maps while special features provide the authorities with the potential to screen all other data sent by farmers (water, waste management) as well as to assess statistical evaluation of the collected data at regional scale.

Visit the website of AgroStrat for more details  
<http://www.agrostrat.gr/?q=en/node/10>

For the application of the tool to other areas or cultivations contact :  
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# Life Cycle Analysis of pistachio production in Aegina

## Preliminary results

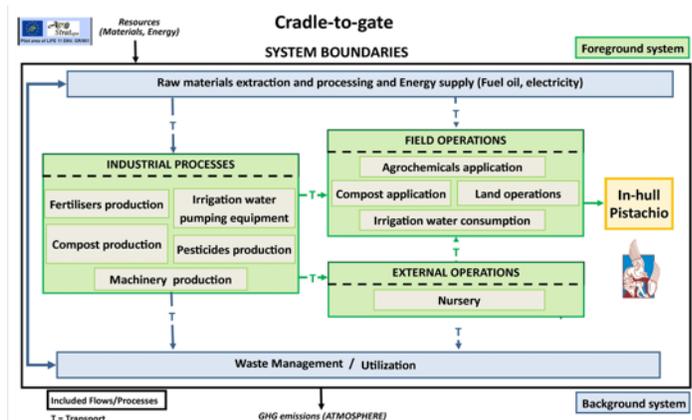
Technical University of Crete

| Impact category                        | Acronym | Units   |
|--|---------|---|
| Acidification potential                | AP      | kg SO <sub>2</sub> -eq FU <sup>-1</sup>               |
| Eutrophication potential               | EP      | kg PO <sub>4</sub> -eq FU <sup>-1</sup>               |
| Global warming potential (100 years)   | GWP     | kg CO <sub>2</sub> -eq FU <sup>-1</sup>               |
| Ozone depletion potential              | ODP     | kg CFC-11-eq FU <sup>-1</sup>                         |
| Photochemical ozone creation potential | POCP    | kg C <sub>2</sub> H <sub>4</sub> -eq FU <sup>-1</sup> |
| Cumulative energy demand               | CED     | MJ FU <sup>-1</sup>                                   |

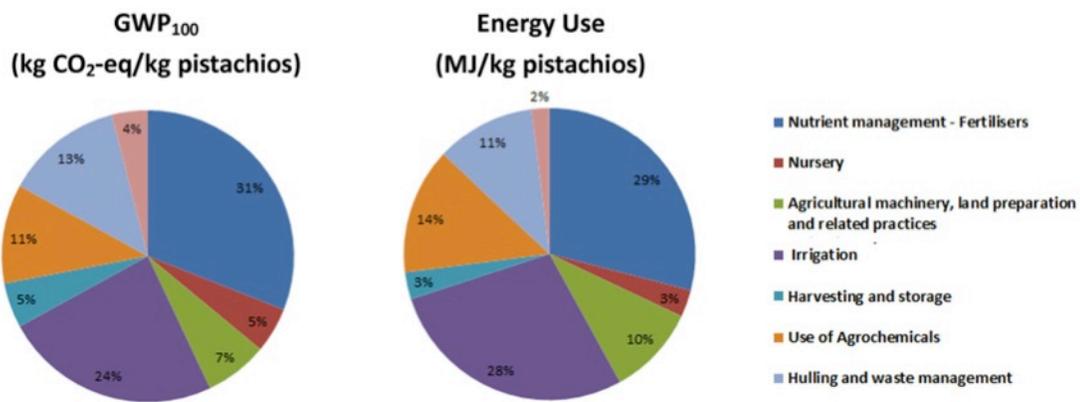
Three different scenarios (baseline and two alternative) were investigated for pistachio production using the cradle-to-farm gate approach:

- the BS (Baseline Scenario) based on the current conventional approach used in Aegina
- the GS (Green Scenario) including the use of biological fertilizers, namely compost and
- the WM (Waste Management Scenario) involving the production of biochar from agricultural wastes and the benefits in terms of carbon sequestration and improvement of soil quality.

TUC carried out an LCA study in order to determine the impacts of pistachio production including valorization of agricultural wastes. Six impact categories were considered to determine the consumption of raw materials (agricultural waste, pesticides, fertilizers, irrigation water) and energy by calculating their associated GHG emissions. Based on the pistachio production characteristics, the functional unit (FU) used in the present study was the production of 1 kg of pistachios.



Based on current preliminary LCA modelling results, one kg of pistachio production in Aegina is responsible for the generation of approximately 2.4 kg CO<sub>2</sub>-eq (GWP) and the consumption of 36.5 MJ, in the BS (Baseline Scenario) (without considering co-product credits)



Breakdown of GWP<sub>100</sub> and Energy by Operation

In the GS (Green Scenario) energy consumption and GHG emissions were ~11% and ~17% lower compared to the BS, respectively.

Higher reduction in energy consumption (~13%) and GHG emissions (~19%) compared to the BS was attained when the WM scenario was considered.

## EVENTS

## Workshops

On 26 September 2015, in the framework of the 7th Fistici Fest in Aegina island, Greece



The audience



The Vice Regional Governor of Attiki Region, Mr. P. Chatziperos



The Major of Aegina island, Mr. D. Mourtzis

On 17 December 2015, in Lamia, Fthiotida, Central Greece



The audience and the Vice Regional Governor, responsible for the Agricultural Development, Mr. G. Kelaiditis  
Region of Sterea Ellada, Central Greece



Registration

## Training Sessions and Events

for farmers and their associations

20 May 2015

Aegina island



An informative event for Aegina's pistachio producers was organized by the Agricultural Association of Aegina Island. AgroStrat presented evaluated results as regards soil and water quality of the area as well as future actions. The Cultivation Management Software was

presented, while producers were trained on using the tool.

The event was broadcasted by Aegina Portal WEB TV.

25 September 2015

Aegina island



The workshop took place at the premises of the Agricultural Association of Aegina Farmers in the framework of the 7th Fistici Fest (24-27 September 2015).

Farmers were trained to:

- input soil, water and composts chemical analysis,
- evaluate the output of the software regarding soil, water and compost quality as well as fertilization consultancy.

16 December 2015

Lamia, Central Greece

The training workshop was organized in Lamia, Central Greece for pistachio producers, agronomists and the two local pistachio producers associations. The participants were trained by Mr. Nikos Papadopoulos (Institute for Mediterranean Studies) and Dr. Maria Doula (project coordinator-Benaki Phytopathological Institute) on the use and functionality of the Cultivation Management Software. In specific, the participants were trained on uploading soil, water and compost data on the software and receiving quality consultancy; on receiving fertilization consultancy and on using the Central Management Monitoring Tool (CMMT).



## Composting in Aegina by local farmers

After the training workshop in Aegina island on how to compost pistachio wastes, local farmers made their own composts, which are now ready to be used as soil amendments



### Ready composts contain:

Organic matter : 28-34%  
 Nitrogen : 3-4%  
 Potassium : 1.0-1.6% as  $K_2O$   
 Phosphorus : 0.5-0.8% as  $P_2O_5$



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