



Policy

Europe: RDPs (Pillar I and II); CAP; Reg. 1698/05 1974/06 (rural development)

Austria, Hungary, Italy: CAP GAEP Cross-Compliance Standards /CAP Rural Development Plans 2014-2020

Italy: Agricultural policy instruments; Regional RDP; Law n. 4/2011 National Integrated Production Quality System

Campania Region: Integrated Production Regulations of the Campania Region (Decree 29 29.02.2019) and Integrated Production Specification for the Olive Tree

First draft

TOOL OLIVE GROWING – Territorial Scale: Local

WHY

Successful planning and management of olive groves are essential in order to economically sustain olive grove cultivation in many rural areas. Therefore, a tool for supporting sustainable olive grove production is crucial. Here we present a tool with the aim of (i) guiding local farms towards high quality olive oil production and (ii) supporting strategic olive grove planning on a district scale.

FOR WHOM

The tool for Olive growing – Telesina Valley is designed to be used by olive grove farmers, consortia and olive growing cooperatives that operate in agriculture, with special attention to olive grove suitability and landscape conservation, by recognizing, preserving and enhancing the value of the olive grove landscape.

HOW – if you want to select your Region Of Interest (ROI)ⁱ

The tool can be applied to anywhere in the entire Telesina Valley and allows free selection of a region of interest (ROI) through a very simple procedure:

Operational procedure

- Click on the "Draw (Polygon)" button on the top bar and draw the desired area (ROI). Then, assign a name to this ROIⁱⁱ.
- By using the "Save" button, the ROI is included in the memory, stored in the system and it may be re-selected whenever necessary

HOW – if you aim to “GO AND DISCOVER YOUR LANDSCAPE” and “THE LABEL OF YOUR OLIVE GROVE”

Operational procedure

Click either on “Go in and discover your landscape” or “The label of your olive grove” and select the region of interest previously drawn and saved. In both cases, a pdf file is generated in real time containing a large set of data relevant to quality olive oil production, including geographical, topographical, climatic, geological, pedological and land use information, as well as the possible presence of sites affected by Legal Restrictions or important parametersⁱⁱⁱ (fig. 1)

To view the pdf file, simply click the last operation in the "Results" button and select; in the lower section "Elaboration detail".

What for

The obtained information gives a basic knowledge of the selected ROI and provides the basis for sustainable planning. For instance, information on soil type, geography, topography and solar radiation supports decisions about the choice of variety and the sustainable management of the olive grove.

HOW – if you aim to consult different Maps or Bioclimatic Indexes

The tool allows - within the selected ROI – the navigation of different maps related to olive grove management which provide products directly displayable as maps and/or tables (Solar radiation in figure below). The following sub-tools are available:

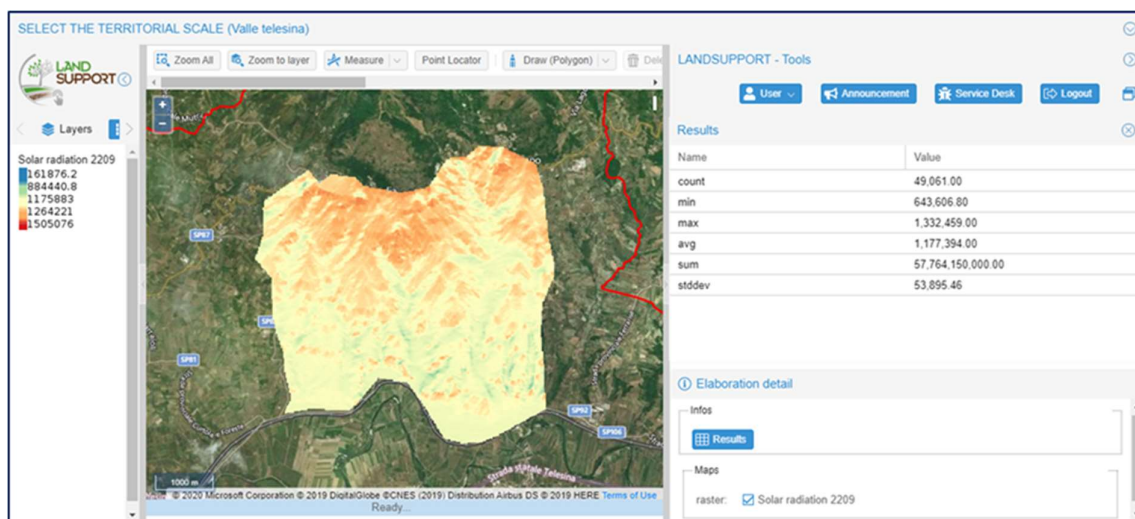
- Soils on your olive-growing farm
- Length of the growing season
- Thermal daily range
- Thermal summation mapping
- Solar radiation mapping

Operational procedure

After clicking on the icon for the parameter of interest and selecting the ROI, the results obtained can be visualised in the "Results" section.

What for

All of the parameters support better olive grove planning within the ROI. This tool is especially designed to identify the spatial variability (map) of selected parameters, thus providing geospatial information which is very useful in the choice of olive grove varieties, the planting layout and the best planning management practices (e.g., potential pruning)^{iv}.



HOW – if you aim to “SUPPORT TO THE MANAGEMENT OF YOUR OLIVE GROVE”

Operational procedure

By clicking on the “Support to the management of your olive grove” icon, it is possible to consult daily climate data and climate series data with respect to rainfall, temperature and wind speed^v.

Basically, the user can select the parameter of interest within the ROI and the desired time interval. The results are found in the "Results" section and can be displayed, one at a time, by selecting the last operation performed and clicking on the buttons in the "Elaboration detail" section. The data can be consulted both in table format and as a graph, and both can be downloaded into different file extensions.

What for

Knowledge of current data and historical trends of the temperature, rainfall and wind speed, allows more sustainable management of natural resources and support for the planning of farm actions. In addition, analysis of the time series of climatic data can help in the evaluation of potential risks of pathogen attacks (e.g. oidium, olive fly).

LIMITATIONS

The user must be aware that the following limitations exist.

Climate data are obtained by COSMO-LEPS data (8 km spatial resolution). Therefore, the data obtained may be rather coarse when employed on the farm scale, especially in complex hilly landscapes (see technical sheet on agroclimate services).

Soil maps – along with all other thematic layers - inherit the limitations (scale, no. of observation etc.) of the original maps (see metadata on the platform). For instance, the reference soil against which the water stress is calculated may differ from a specific soil in a specific area because of the spatial variability of local soil.

FUTURE DEVELOPMENT

New climatic indexes will be employed as suggested by stakeholders. Between them (i) an air humidity index to better assess and predict potential pollination and thus potential yearly yield, (ii) a new thermal indicator that will calculate maximum temperatures and their duration may be useful to predict the risks of pathogen attacks.

Other future developments are expected in methods enabling the end-user to upload his own soil and (possibly) meteorological data.

ⁱ Special care is required when user draws/select the Region of Interest. In fact LANDSUPPORT is a multi-scale decision support system. Each of the 15 available tools is designed for a specific application and for a specific scale. Furthermore, the databases using specific standards required for that specific scale. The users of LANDSUPPORT web platform must therefore be well aware of the limitation embedded in the different maps that they require for their specific application. The users must be expert on their specific problem and must understand if the input data offered by the platform are suitable for their problem. In light of the above, the system provides very reliable results only if used appropriately.

ⁱⁱ It is also possible: i) to draw a ROI with numerous polygons. In this case, it is possible to assign different values (e.g. numbers) to each of the drawn polygons; ii) upload single/multi polygons from GIS environment

ⁱⁱⁱ The set of data consist of a selection of layers (raster or vector format) stored within the Landsupport geo-database. These data come from official data-providers (namely local offices of Regione Campania), previous research project and data processing (e.g. slopes or aspect data result from DEM – Digital Elevation Model processing in GIS environment).

^{iv} Bioclimatic indexes have been calculated within the Landsupport activities. They derive from the processing of Digital Elevation Model and re-analysis weather data (ERA5 LAND model).

- Length of growing season: represents the number of days (from Jan 1 to Dec 31) registering mean temperatures above 10°C;
- Thermal daily range: represents the mean difference between max and min daily temperatures for the period June – September. The index has been calculated considering five years of data (previous project);
- Thermal summation: represents the summation of daily temperatures above 12°C (active temperatures) from Jan 1 to Dec 31;
- Solar radiation: represents the potential yearly based solar radiation ($W/h*m^2$), calculated with GIS plugin using as reference data the Digital Elevation Model.

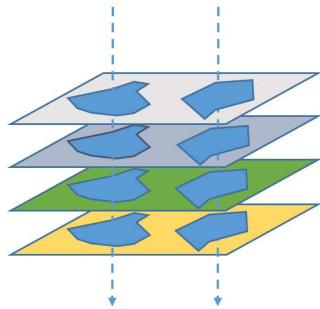
^v Climate data come from COSMO-LEPS model. They are automatically ingested in the Landsupport database as GRIB file format ready to be processed and stored as datacube queryable everywhere in the study areas.

Layer 1

Layer 2

Layer 3

Layer 4



ROI selected for statistics

Label describing your olive grove

Geographical features

Surface area : 2052.74 [ha]
 Municipality : N/A
 Coordinates of the center of the area : 41.22395 N 14.57004 E

The landscape

Elevation (average): msl 107.7
 Slope (average): % 6.4
 Aspect (average): class South

The climate

Work in progress

Some important issues in oliviculture oriented towards oil quality

Annual solar radiation [kWh/m ²]	Min	Average	Max	Average over full study area
	N/A	N/A	N/A	N/A

Geology

Arenarie quarzitiche/Ortoquarziti	740.96 [ha]	36.6 %
Sabbie e ghiaie di piana alluvionale	538.74 [ha]	26.2 %
Calcareniti	261.80 [ha]	12.8 %
Sabbie e ghiaie di terrazzi fluviali	236.44 [ha]	11.5 %
Igumbriti	206.22 [ha]	10.0 %
Depositi di conoidi	49.56 [ha]	2.4 %
Depositi ghiaiosi non cementati di scarpata	36.33 [ha]	1.7 %

Soils

Consociazione dei suoli Taverna Stara	273.39 [ha]	13.1 %
Consociazione dei suoli Masseria Marcatelli	247.09 [ha]	11.9 %
Consociazione dei suoli Coste del Duca	236.17 [ha]	11.3 %
Consociazione dei suoli Bosco Caldaia	216.16 [ha]	10.5 %
Associazione dei suoli La Ceresa, Toppo Verciunni	144.50 [ha]	7.0 %
Associazione dei suoli Crugliano, Impiano	132.12 [ha]	6.3 %
Associazione dei suoli Masseria la Grotta, Pera Tonda	120.73 [ha]	5.8 %
Consociazione dei suoli Calore	105.70 [ha]	5.1 %
Consociazione dei suoli Pennine	95.95 [ha]	4.6 %

PDF document (on the-fly)

Fig 1: Landsupport generates on the-fly PDF documents by operating spatial statistics over user selected ROI