



Policy documents

Europe: Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021.

Dir.91/676/EEC (Nitrates Directive), EU Soil Strategy for 2030 COM(2021) 699 final

Austria, Hungary, Italy: CAP Greening Payment Requirements and GAEP Cross-Compliance Standards, Austrian Programme of agricultural environmental measures (Austria), Act on the Protection of Cultivated Soil (Hungary), Regional RDP; dlgs 18/05/01 no. 227 (Italy)

First draft

TOOL BEST PRACTICES – Scale: Regional

WHY

On 2 December 2021, the agreement on reform of the EU Common Agriculture Policy (CAP) was formally adopted. The new legislation, which is due to begin in 2023, paves the way for a fairer, greener and more performance-based CAP. It will seek to ensure a sustainable future for European farmers, provide more targeted support to smaller farms, and allow greater flexibility for EU countries to adapt measures to local conditions.

Indeed Article 12 says “Member States shall define, at national or regional level, minimum standards and good practices (in line with GAEC and SMR) taking into account specific characteristics of the areas concerned, including soil and climatic conditions, existing farming system, land use, crop rotation, farming practices and farm structures”.

The modelling analysis that is performed with the Best Practice tool can give clear results about the production and the environmental impact in a given area in what-if scenarios of field management. The Best Practices tool supports Member States in defining agricultural measures, allowing them to assess the potential effects of some of the main agricultural practices on different crops.

FOR WHOM

The Best Practices tool is designed to assist multiscale agriculture Public Authorities and farmer advisors in designing plans and in evaluation of impacts of the measures in order to ensure environmental sustainability and optimum soil management and conservation.

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

The tool works over the Campania Region, Marchfeld and Zala County and allows the free selection of any region of interest (ROI), administrative unit (e.g. Municipality) by following this simple procedure:

Operational procedure for ROI (draw, save, plot)

- By clicking on the "Draw (Polygon)" button on the top bar, drawing the desired area (ROI) and assign it a nameⁱⁱ;
- Using the "Save" button, the ROI is stored in the system memory and can be retrieved whenever necessary.

Operational procedure for Administrative Unite (select, plot)

- By clicking on the "Select Administrative Unit" button on the top bar is possible to select the AU of interest (e.g. municipality).
- Using the "Run" button, the AU is clipped within the database and results are shown (see Results section).

HOW**Operational procedure**

After clicking on the " Cross-compliance and conditionality" icon in the toolbox and selecting the "Best Practices" tool, a drop-down menu appears from which the users can make a pre-selection of a group of trails; indeed the interface pops up and here the user finds boxes in to choose the ROI, the crop (7 possible crops) with dropdown list. When the user flag the boxes about the type of system (organic and conventional), the fertilization rate reduction (optimum rate, 15% reduction, 30% reduction), the tillage (ploughing, minimum tillage, sod-seeding), or the cover crop cultivation, different combinations of these practices are dynamically simulated for the chosen ROI and crop(s). The combinations have been defined as feasible solutions to apply in the regional case studies.

For each of the simulated soils and scenarios, the tool returns the mean annual value of crop yield, nitrate leaching, and the change of the soil organic carbon stock in the upper soil layer (0-0.4 m). The tool also provides the value of the synthetic "best practices index" (IBP) that is computed as a linear combination of the three variables and the weights that the user dynamically assigned to each of the variables. The user can then sort by descending order the IBP values to identify the most suitable solutions (i.e., combinations of practices) according to the specific goal (e.g., increase in soil organic carbon). The mean value of IBP is plotted in charts for each of the simulated combinations.

What for

The tool allows to identify the best practice to apply according to the user's goal. The tool is meant to be applied by:

- public authorities, such as regional environmental agencies, to find the best solutions out of feasible management practices according to the overall goal (e.g., increase in soil organic carbon stock, reduction of nitrate leaching) or in view of CAP Eco-schemes;
- farmers who want to evaluate the crop production under current and optimized management.

LIMITATIONS

The user should be aware that the following limits exist. Spatial variability of climate data is not actually considered. The soil maps, just like all the other thematic layers, have inherited the limits (scale, n. observation, etc.) of the original maps (see metadata on the platform). Currently, in this specific tool, the model cannot work with user-customizable data.

FUTURE DEVELOPMENT

It is planned to develop a system that will allow the user to enter his/her own data in a bottom down approach. Due to the link to the ARMOSA process-based model, the tool offers the great opportunity of a close representation of actual and optimized cropping systems with the possibility of further applications at larger scale (e.g., European), in other regional case studies, and in tailored scenarios in which the user enters her/his own data of soil properties and climate.

In future could be possible to select also the climate IPCC scenario and the period in which to carry out the analysis (current, near and far future under RCP4.5 and RCP8.5).

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 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. Considering the above, the system provides very reliable results only if used appropriately.

ⁱⁱ It is also possible 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.