

## AGRORICE: INNOVATIVE WEED MANAGEMENT TOOLS IN RICE



Country	Contract value (€)	% carried out by Epsilon	No of staff provided	Client	Origin of funding	Date (start/end)	Consortium Members
Greece	100.800,00	80% 80.640,00	5	European Commission Greece	EC ΓΓΕΚ ΕΣΠΑ	01/03/2021 01/09/2022	3 Partners

### Description of the project

The **AGRO-RICE-TOOLS** project is focused on developing innovative tools for weed management in rice cultivation, with a particular emphasis on addressing the problem of red rice (*Oryza sativa*), which poses a significant threat to rice farming in Greece. The project utilizes advanced technologies, including UAVs (drones) equipped with multispectral sensors and cloud-based platforms, to map, monitor, and manage weeds more effectively. The primary goal is to improve the sustainability and competitiveness of Greek rice production by creating tools for detecting and managing herbicide-resistant weeds, particularly red rice, which has become resistant to imazamox herbicide. By leveraging satellite data (from the Copernicus program), UAV imagery, and machine learning algorithms, the project aims to optimize weed management and reduce the associated costs

Agrorice objectives are:

- To create innovative tools that utilize UAVs (drones) equipped with multispectral sensors, satellite data from the Copernicus program, and image processing algorithms for the detection and mapping of weeds, especially red rice (*Oryza sativa*), in rice cultivation.
- To provide decision-making tools for the effective management of red rice, which is resistant to herbicides like imazamox. The project focuses on managing herbicide-resistant weeds using advanced technologies to minimize costs and maximize effectiveness.
- To integrate smart farming techniques into rice production, using GIS-based platforms and sensor technology to support sustainable and competitive agriculture.
- To reduce the costs of weed management in rice farming by adopting validated scientific methods and technologies, aiming for a 30-35% reduction in management costs through the use of these tools.

### Services provided

#### Development of Web-GIS Platform:

- Epsilon was responsible for creating a spatial database and a web-based GIS (Geographic Information System) map for weed management, specifically for mapping and monitoring red rice in rice

#### Cloud Platform Development:

- Epsilon developed a cloud platform that integrated smart digital tools for managing herbicide resistance, the risk of weed spread, and management strategies. This involved using ArcGIS ESRI technology and Python programming to incorporate geographic and descriptive data to assist in decision-making and problem management fields.

#### Algorithm Development:

- Epsilon developed an algorithm to predict weed risk at the field level, utilizing geostatistical methods for accurate prediction and management of weed patterns.