

Technology Offer

CSIC/VC/039

Drone sensor for soil moisture and irrigation efficiency



Droughts demand more precise technologies to measure soil moisture. The solution uses a drone-mounted sensor that reaches 50 cm depth, with a spatial resolution of 20 m and coverage of 30 ha/hour. It enables monitoring of large areas, optimizing irrigation, and detecting water leaks with high efficiency.

Intellectual Property

Priority patent application filed

Stage of development

Early stage technology, TRL-3

Intended Collaboration

Licensing and/or co-development

Contact

Virginia Cousté
Vice-presidency for
Innovation and Transfer
Virginia.couste@uab.cat
comercializacion@csic.es



Market need

Climate change is intensifying droughts, severely affecting agricultural production. To ensure food security, better management of water resources is essential. This requires knowing soil moisture both at the surface and at depth, in order to anticipate crop water needs.

In-situ sensors and satellites face limitations in terms of accuracy or maintenance (e.g., damage caused by wildlife; satellite measurements with spatial resolutions of tens of kilometers).

Moreover, water distribution networks suffer losses that are difficult to locate. The sector needs new solutions that enable efficient leak detection



Proposed solution

The developed technology consists of a radio wave drone-mounted sensor, capable of providing soil moisture measurements both at the surface (5 cm) and at depth (50 cm), with a pixel size of around 20 m. This information can be used to make irrigation more efficient and to anticipate crop water needs, helping to select the most suitable crop type for each plot, based on deep soil moisture conditions.

For water distribution networks, it is also an effective tool to detect subsurface moisture and thereby identify leaks that would otherwise remain hidden.

Competitive advantages

- Soil moisture measurement at surface and depth over large areas.
- Measurements up to 50 cm depth.
- Spatial resolution: 20 m.
- 30 ha measured per hour