



**Practice Abstract 10 -
Addressing the Adoption of Sustainable Practices
Through Multi-criteria Assessment**

Summary for practitioners

Problem:

Traditional farming practices often overuse inputs, such as herbicides, treating with a global treatment approach. This results in higher environmental impact and increased costs for farmers. Advanced resource-efficient methods such as spot spraying technology, are on the market, but they are not yet widely used by small and medium sized farms.

Solution:

A multi-criteria evaluation framework calculates a wide range of indicators (Figure 3) to provide an assessment of new resource-efficient methods like spot spraying technologies. For example, Systerre®, a web-based tool, calculates technical, economic, and environmental indicators.

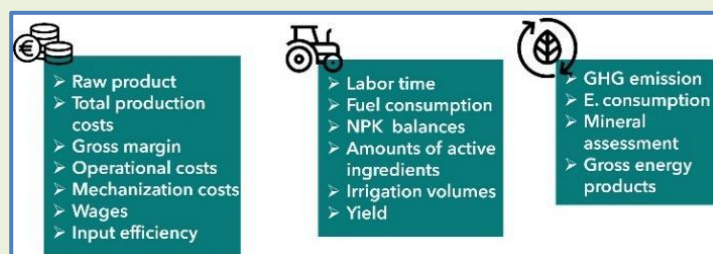
Spot spraying, powered by advanced AI and sensors, applies herbicides only where weeds are detected, significantly reducing inputs. By combining practical evaluation tools with digital technologies, farmers can obtain reliable data to support sustainable practices.

This method will be carried out as part of case study 8 of the Farmtopia project (Figure 2) to assess the performance of spot spraying on maize and wheat and to provide recommendations for making the technology accessible to SMEs.

Practical Recommendations:

Multi-criteria assessment has several advantages:

- Gathering useful information about the farm.
- Measuring post-performance of a system: it allows farmers to assess the overall impact of their cropping system and the practices that can or may affect their farm, based on solid indicators.
- Prior assessment of evolution scenarios.



Main indicators calculated by Systerre®, a multi-criteria evaluation tool

Results expected in SIP8:

- ≥30% reduction in the herbicide usage,
- ≥30% reduction in input costs,
- Stable net margins



Sprayer equipped with spot spraying sensors on a farm in Saint-Hilaire-en-Woëvre (France). The sensors used are from the company CarbonBee. ©ARVALIS

Further information

- Systerre® is a web tool, available in French and English, owned by ARVALIS, Terres Inovia, ITB and Acta (France). It produces multi-criteria references (economic, environmental, and technical) on innovations. Contact: systerre@arvalis.fr
- Perriot B., Desbourdes C., Jouy L., 2022. Adventices en maïs et prairie : de la détection à la pulvérisation ciblée. Weeds in maize and grassland: from detection to targeted spraying. In: Phloeme

- Metais, Pascale & Bonin, Ludovic & Benjamin, Perriot & Desbourdes, Caroline & de Solan, Benoit, 2018. Gestion des adventices par l'agronomie et les agroéquipements : moyens mobilisables et perspectives. Weed management using agronomy and agricultural equipment: available resources and prospects.
- CarbonBee, 161 Av. de Romans, 26000 Valence, France. Contact: <https://carbonbee.fr/#contact-bottom>

About this Practice Abstract and Farmtopia

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Farmtopia: The project is running from September 2023 to August 2026. The overall goal of Farmtopia (**GA No.: 101083541**) is to democratize digital farming to empower small and medium farms.

Website: <https://farmtopia.eu/>

ARVALIS: As part of the Farmtopia project, ARVALIS is leading case study 8 on the evaluation of a spot spraying solution.

Website: <https://www.arvalis.fr/>

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