

Diversifying rotations by introducing spring crop to reduce weed pressure in Berry (France)

Problem

For economic reasons, rotations in the Berry region are short and focused on winter crops (rapeseed-wheat-barley). Such rotations are prone to high weed pressure (such as bedstraw, hedge mustard, geraniums, etc., including resistant weeds), and lead to a high dependence on herbicides (average TFI of 2.9). Ten-year projections (carried out by Arvalis, Terres Inovia and ITB using the Systerre® tool) have shown that weed pressure may increase further in these rotations, leading to a 37% increase in herbicide use, an 8% loss in crop productivity and a 60% decrease in profit.



Picture 1 Foxtail, a resistant weed in the Berry region of France. (Source: ARVALIS)

Applicability box

Theme

Rotation, cropping system, weed management

Agronomic conditions of Berry (centre of France)

Climate : Degraded oceanic

Average T°C in winter : 5°C

Average T°C in summer : 20°C

Precipitation/year : 700-750mm

Soil of the region :

60% (clayey silts)

40% (sandy silts)



Application time

All the year

Period of impact

All the year

Equipment

Weeder and weed harrow

Best in

Short rotations of winter crops

Solution

To limit and reduce weed pressure and herbicide dependency, diversified cropping systems are being investigated. Diversifying rotation to rapeseed-maize-sunflower-soft winter wheat, i.e., by adding spring crop species for two consecutive years, may help reduce pest and disease burden. Other spring crops than maize and sunflower, e.g., lentils, can be added in the rotation to add value whilst breaking weed cycles.



Picture 2. Arable cropping field experiments in Berry, France as part of DiverIMPACTS FE4 activities. Source: ARVALIS

Benefits

This type of rotation significantly reduces weed pressure. Ten-year projections have shown (i) a reduction of herbicide use by 35%; (ii) a reduction of greenhouse gas emissions by 32%; and (iii) with high value crops added, an increase in net margins by 12%.

Practical recommendations

- Implement strategies combining deep (teeth) and superficial (discs) works to create **false sowings** and bury seeds.
- Use of a **weeder on maize and sunflower fields** up to the V3-V5 stage at most (max. 8 visible leaves). Possible to use it before crop emergence depending on the sowing depth.
- Use of a **weed harrow on cereal fields**: in the pre-emergence stage for cereals sown quite deeply (4 to 5 cm); in the germination or seedling stage for weeds; in the vegetation recovery stage (mid-February to mid-March) for young weeds in dry conditions.
- For rapeseed, success will require **increased biomass** in Autumn to compete with weeds.
- For **short intercropping periods**, prefer early summer legumes (egyptian clover or fenugreek); For **longer intercropping periods**, sow species that are useful for carbon and nitrogen management (phacelia, broad bean, radish, buckwheat, etc.)

Further information

Video

- [Building together tomorrow's crops systems \(ENGLISH SUBTITLES\)](#)
- [Inauguration de la plateforme Syppre dans le Berry \(FRENCH\)](#)
- [ARVALIS - Institut du végétal : Research & Development to arable farmers \(ENGLISH SUBTITLES\)](#)

Weblinks

- [Syppre Berry \(FRENCH\)](#)
- [ARVALIS - Institut du végétal \(ENGLISH\)](#)
- [Terres Inovia \(ENGLISH\)](#)
- [ITB \(ENGLISH\)](#)

Use the comment section on the DiverIMPACTS discussion forum to share your experiences with other farmers, advisors and scientists! If you have any questions concerning the method, please contact the author of the practice abstract by e-mail.



About this practice abstract and DiverIMPACTS

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this practice abstract is derived from Syppre experimental platform set up in 2015 in Berry (Central France).

DiverIMPACTS: The project is running from June 2017 to May 2022. The overall goal of DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability - is to achieve the full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains.

Project website: www.diverimpacts.net

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