INTERCROP VALUES

PRACTICE ABSTRACT N26

Lentil-based crop mixtures for yield optimisation

Problem

In organic and conventional lentils, yields are often limited by weeds, lodging, and bruchids, which vary from year to year and from region to region.

Solution

The proposed solution is to grow lentils in mixture with another crop (here camelina or barley).

Benefits

Such mixtures should help limit weeds, lodging, and bruchids, thereby improving gross margins by limiting yield losses.

Applicability box

Theme

Crop production; Cropping systems; Legumes; Weed management; Disease and pest control.

Keywords

Crop management; Diversification; Intercropping; Legumes; Seedbed preparation.

Context

All areas where lentil is cultivated.

Equipment

Sowing machine, combine harvester, and grain separator.

Best in

All cropping systems aimed at produce lentils.

Practical recommendations

- Lentils must be sown at the recommended density (300 to 400 seeds/m²), and the soil must be well prepared to ensure good contact between the soil and the seeds to guarantee a satisfactory germination rate (68% in our trials, with an average ranging from 45 to 98%).
- The density of the associated cereal (in this case barley) must not exceed 25% of that in a pure crop to limit competition with the lentils (Viguier, 2018).
- The target density for camelina should be around 50 plants/m², but due to the low germination rate (13% on average in our trials, ranging from 4% to 35%), it is recommended to sow camelina between 2-4 kg/ha.
- The mixture should be harvested as soon as possible and immediately sorted to remove any impurities, then treated by freezing or asphyxiation to kill weevils (see PA N°4).

Figure 1: Lentil-Camelina mixture (left) and Lentil-Barley mixture (right). Photo: Laurent Bedoussac, ENSFEA.

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Figure 2: Main results obtained from experiments conducted on farms in north-western France as part of CICS10 (from left to right and top to bottom: (i) crop emergence (%), (ii) crop height at maturity, (iii) dry matter of weeds at harvest, (iv) percentage of bruchid-damaged grains, (v) dry grain yield, and (vi) dry grain yield after removal of bruchid-damaged grains).

Further information

Further readings

- Bedoussac L, Albouy L, Deschamps E, Salembier C, Jeuffroy M;-H.. (2021). From theory to practice of species mixtures: Redesigning European cropping systems based on species MIXtures, 108p., https://hal.inrae.fr/hal-04064291v1
- Viguier L (2018). Analyse de la performance agronomique et économique des associations de culture lentille-blé de printemps en agriculture biologique, https://theses.fr/2018INPT0070.
- Check the Organic Farm Knowledge Platform for more practical recommendations.

About this practice abstract

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IntercropVALUES aims to exploit the benefits of intercropping to design and manage productive, diversified, resilient, profitable, environmentally friendly cropping systems acceptable to farmers and actors in the agri-food chain. As a multi-disciplinary and multi-actor project, it brings together scientists and local actors representing the food value chain. It includes 27 participants from 15 countries (3 continents) from a wide diversity of organizations and stakeholders. The project will run for four years and started in November 2022.

Project website: https://intercropvalues.eu/

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