Harvesting and separating crop mixtures: yes we can!
Laurent Bedoussac, Deschamps Elina, Albouy Lisa, Patrick Bourrachot, Alastair Morrison, Eric Justes

To cite this version:
Laurent Bedoussac, Deschamps Elina, Albouy Lisa, Patrick Bourrachot, Alastair Morrison, et al.. Harvesting and separating crop mixtures: yes we can!. Intercropping to boost agroecology in European Agriculture, Mar 2021, Virtual conference, France. 10p. hal-03342750

HAL Id: hal-03342750
https://hal.inrae.fr/hal-03342750
Submitted on 13 Sep 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Redesigning European cropping systems based on species mixtures

Harvesting and separating crop mixtures
yes we can!

Project start date: May 1st 2017

Laurent Bedoussac (INRAE France)
Elina Deschamps (ENSFEA, INRAE France)
Lisa Albouy (Université de Toulouse, INRAE France)
Patrick Bourrachot (Etablissements DENIS France)
Alastair Morrison (AGCO A/S Denmark)
Eric Justes (CIRAD France)
A wide variety of species mixtures

Sown at the same time or not

Harvested at the same time or not

A sale crop with a service plant

Grains for food

Grains for feed

Fodder

Ecosystem Services
Harvesting and sorting are the main obstacle for farmers (sowing to a lesser extent)
How to sow species mixtures? Marginal innovations but no real breakthrough

Mixing grains at sowing

Sowing in a developed crop

Structuring the stand

Sowing complex mixtures
How to harvest species mixtures?

All at once with low quality constraints

In two stages

All at once with high quality constraints

Adapting the existing but not new machines
How to separate species mixtures?

Low constraints and low added value

High constraints and high added value

No expected revolution in methods (we know how to separated everything...all is a question of cost)
Test existing harvest and separation machinery to improve the value

**Evaluating and optimizing harvesting machinery to species mixtures**

**Evaluating, optimizing and developing grain separation machinery to mixtures**

**Optimize “harvest - grain separation” process for improving the economic value**

Make the separation easier

“What is easy to separate is often hard to harvest”

Need for a compromise

- **Wheat-Lentil**: Easy to harvest & difficult to separate
- **Barley-Pea**: Difficult to harvest & to separate
- **Rapeseed-Pea**: Easy to harvest & to separate
- **Wheat-Lupin**: Difficult to harvest & easy to separate
Optimizing harvest and separation improve the economic value

Harvest settings impact the gross product

Separation improves the gross product

Worst harvest settings | Best harvest settings
---|---
Wheat-Lentil | Rapsessed-Pea | Barley-Pea | Wheat-Lupin

Gross product (€ for 1 ton of harvest)

Worst harvest settings | Gross product after harvest | Best harvest settings | Gross Product after separation
---|---|---|---
Wheat-Lentil | Rapsessed-Pea | Barley-Pea | Wheat-Lupin

Gross product (€ for 1 ton of harvest)
Policy recommendations

- **No need for an immediate revolution**
  - Training farmers for a better use of these machines
  - Support development and purchase of grain separators
    - small-scale size for use at the farm
    - large-scale for grain buyers
- **Need for a multi-actor approach**
  - Support farmer’s collective
  - Support collectors to reorganising their logistic
  - Redesign agrifoodchain and requirements for “purity”