

Cereal-grain legume intercropping in organic farming – a Danish survey

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Introduction Intercropping, farmer-planned diversity in space, is defined as the growing of two or more crops simultaneously on the same area of land. Intercropping may have several advantages: improved use of resources, higher and/or more stable yields and reduced yield losses due to pathogens, insects and weeds. Mixtures of perennial species in grass swards are well-known, whereas intercropping of annual species are less frequent. From year 2000 to 2004 the area of pea-barley intercrops for harvest at maturity has almost doubled in organic farming.

Objective To investigate Danish farmers' experiences with cereal-grain legume intercropping.

Materials and methods A survey among 20 organic farmers randomly distributed all over Denmark was conducted in February 2004. The farmers were interviewed individually in a semi-structured interview gathering quantitative and qualitative data on farm management practices and intercropping experiences. The Danish survey was an integrated part of the EU-FP5 project INTERCROP (www.intercrop.dk).

Results and discussion The average farms had 130 ha and either cattle (70%), pig production (15%) or only plant production (15%). The most frequent cereal-grain legume intercrops were spring barley-field pea (70%), spring wheat-lupin (20%) and spring barley-lupin (15%). Alternatively, barley-oats-pea and barley-oats-lupin were also intercrops used for grain production. The arable land covered by cereal-grain legume intercrops varying from 7 to 85%.

The main reasons for intercropping were easier harvest of e.g. pea-barley compared to sole cropped pea, a high competitive ability towards weeds, less demand for fertilization, less disease and more stable yields (Fig. 1).

The farmers either used the intercrop grains for fodder directly (60%) or the intercrops was sold to Danish seed companies (40%). Seed companies have shown interest in intercrops due to grain health improvements in e.g. intercropped pea and increased grain protein concentration in e.g. intercropped wheat. One major problem is the costs for separating seeds (Fig. 2) charged by seed companies in order to be able to sell the grains separately or due to storage logistics.

More difficulties in weed harrowing and more impurities in the harvested crop were other negative experiences pointed out. In general the positive experiences with intercropping more than counterbalanced the negative experiences.

Some farmers applied slurry or manure to the intercrops (65%) whereas others did not. Similarly, the use of weed harrowing during growth of intercrops varied significantly among farmers. Further research might show under which circumstances fertilization and weed management might be beneficial in cereal-grain legume intercrops.

Conclusion Cereal-grain legume intercropping is well integrated among Danish organic farmers and the use of a survey to integrate farmers' practical knowledge on both cropping obstacles and marked options was shown valuable to target future research strategies.



Positive experiences with intercropping

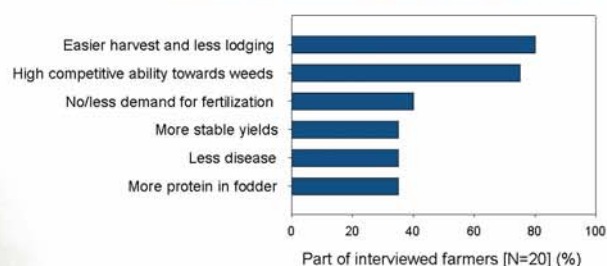


Figure 1. Farmers positive experiences with cereal-grain legume intercropping.

Negative experiences with intercropping

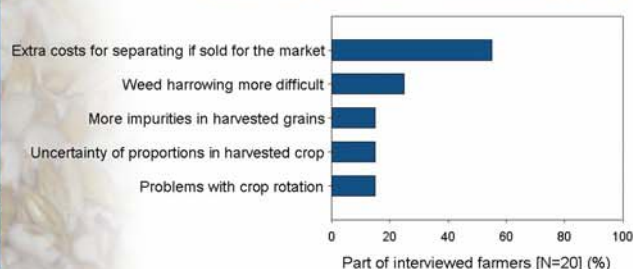


Figure 2. Farmers negative experiences with cereal-grain legume intercropping.

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