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Post-harvest sown catch crops results from two years of organic field trials

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Post-harvest sown catch crops should be sown as early as possible to obtain maximum biomass yield, as biomass production decreased by 2–3.5 % per day, when time of sowing was postponed throughout August. Furthermore, the winter hardy species included in these experiments had a tendency to yield less than the non-winter hardy catch crops.

Background and objectives

Growing catch crops in organic plant production is a key element in efficient nutrient management. Currently, catch crops are ploughed under and used as green manure. However, catch crops may have potential as feed-stock for organic biogas production provided sufficient biomass yields are obtained. The objectives of these experiments were therefore, to quantify harvested biomass yield (and nutrients) of post-harvest sown catch crop as a function of

A) Sowing date of post-harvest sown catch crops
B) Catch crop species or mixtures.

Key results and discussion

An important result from experiment A (Figure 1) is that early establishment is a prerequisite for obtaining above-ground dry matter yields of 2.5-3.0 ton per hectare in the non-winter hardy catch crops. The winter-hardy mixtures (turnip rape/hairy vetch and rye/Persian clover) were not as productive (see figure 1).
An analysis of variance showed significant effects of catch crop and sowing time, but revealed no significant interaction. On average biomass dry matter yield decreased by 2-3.5 % per day that sowing was postponed during the month of August.
In experiment B, which compared different catch crops sown early August, the analysis of variance did not reveal any significant difference between the catch crops. However, the winter hardy species had a tendency to yield less than the non-winter hardy catch crops. Buckwheat, common mallow, foxtail millet and Structurator, which were only field tested one year, yielded below 1 ton dry matter per hectare. On average 57 kg N, 9 kg P and 36 kg K per hectare were harvested in the non-winter hardy catch crops whereas 47 kg N, 7 kg P and 29 kg K per hectare were harvested in the winter-hardy catch crops tested both years.
These experiments imply that early sown catch crops may become a biomass supplement for organic biogas production, provided sufficient yields are obtained and costs for harvest, transportation and storage are adequately low.

How work was carried out?

Two different field experiments were carried out on sandy soils (Pedersen, 2012) in 2011 and 2012. The first field experiment (A) investigated the effect of 4 subsequent sowing dates from late July to late August in five different catch crops with 4 replicates per site.
The second field experiment (B) compared 15 different crops and crop mixtures used as catch crops. In 2011 the experiment had only one replicate. The 2012 experiment were carried out with two replicates. Both experiments were carried out through the Danish National Field Trial System.

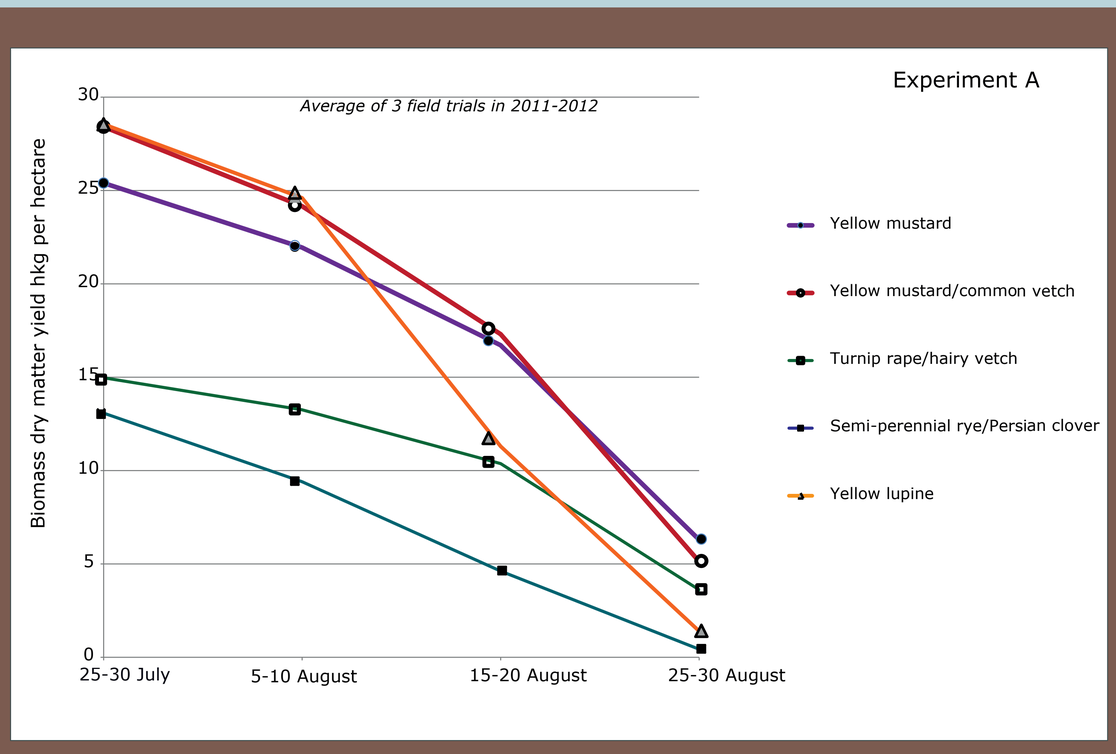

Figure 1
Harvested biomass of five post-harvest grown catch crops in field experiment A sown at four subsequent dates from late July to late August in 2011 (one site) and 2012 (two sites) (from Pedersen 2012).

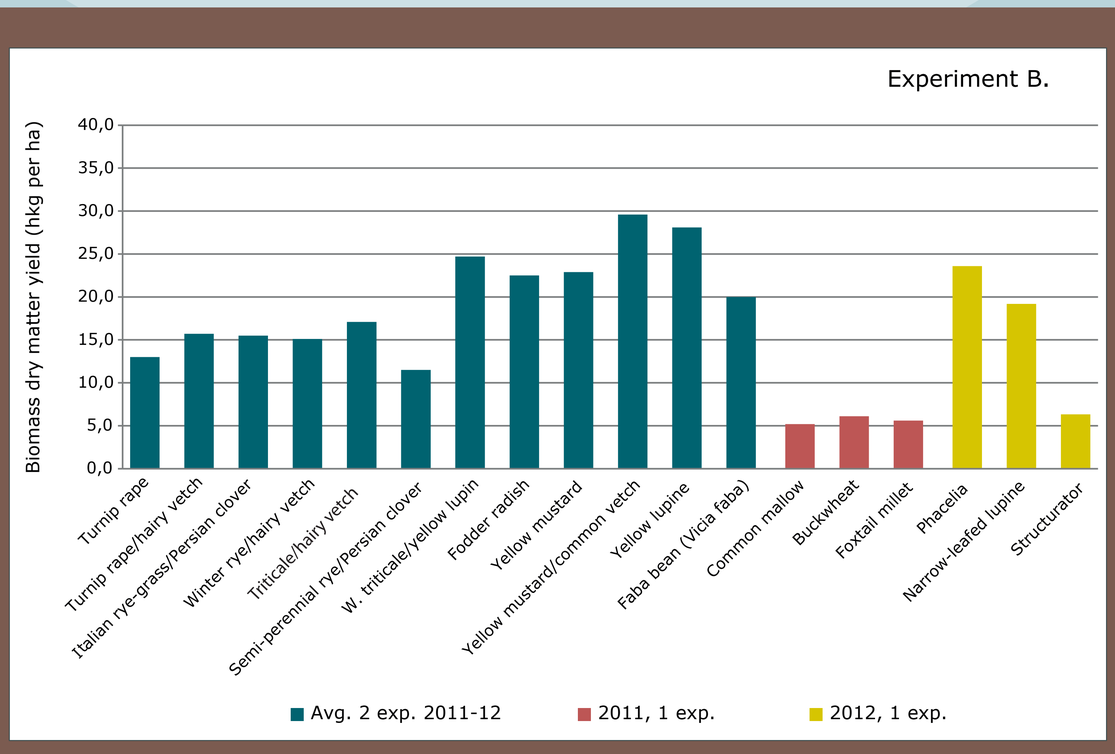

Figure 2
Harvested biomass of post-harvest grown catch crops in field experiment B sown early August in 2011 and 2012 (from Pedersen 2012).

References

Pedersen JB (2012) Oversigt over Landsforsøgene 2012 (Overview of the National Field Trials). *Forsøg og undersøgelser i Dansk Landbrugsrådgivning. Videncentret for Landbrug*, 488 p.

Acknowledgements

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