Improve protein self-sufficiency through pulse crops

Topic: Technical efficiency

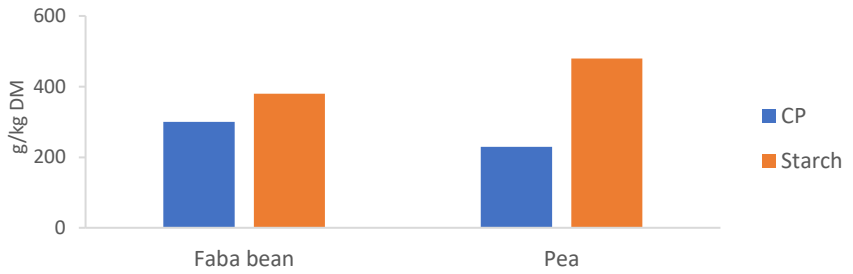
Topic: Environment

Background

Pulses, such as faba beans and peas, are annual grain legumes that can be grown and used as feed to reduce dependence on purchased fertilisers and imported feeds. Legumes fix atmospheric nitrogen in association with Rhizobium bacteria in their root nodules and leave also some N in the field for the subsequent crop. Using pulses, protein supplements can be produced on the farm with virtually no nitrogen fertilisers.

Faba bean and pea as concentrate feeds

- Pulses contain more crude protein than cereals, but less than protein feeds such as soya bean and rapeseed meal.
  - Faba beans: ≈300 g/kg DM (280 - 350)
  - Peas: ≈ 230 g/kg DM (190 - 290)
- They contain more starch than protein feeds but less than cereals.
  - Faba beans: ≈ 430 g/kg DM (380 - 480)
  - Peas: ≈ 500 g/kg DM (430 - 575)



- The rumen degradability of protein is higher for legumes than for rapeseed meal or expeller, which means that a higher proportion of the crude protein in the feed is broken down in the rumen.
  - This is advantageous if the ration is low in rumen degradable protein but increases nitrogen losses when the basal diet is high in crude protein.
- High starch content increases microbial protein synthesis compared to protein feeds.

Positive features

- Due to biological nitrogen fixation, the use of nitrogen fertilisers can be reduced.
- The use of legumes reduces the need for purchased feeds and increases self-sufficiency.
- Legumes diversify crop rotations and improve soil fertility.
- Good pre-crop value.
- Legumes contribute to biodiversity as their flowers attract pollinators.
- A diverse crop rotation stimulates microbial activity in the soil, which contributes to plant well-being and increases their yield potential.

Be careful, especially on these points

- Grow varieties suitable for your area in suitable soils where the pH is not too low.
- Do not over fertilise.

Biological nitrogen fixation

Approximate amount of nitrogen fixation:

- Faba bean 50-100 kg N/ha/year
- Pea 40-80 kg N/ha/year

Excessive nitrogen uptake from the soil or N fertilisation reduces nitrogen fixation

Preservation methods for pulses

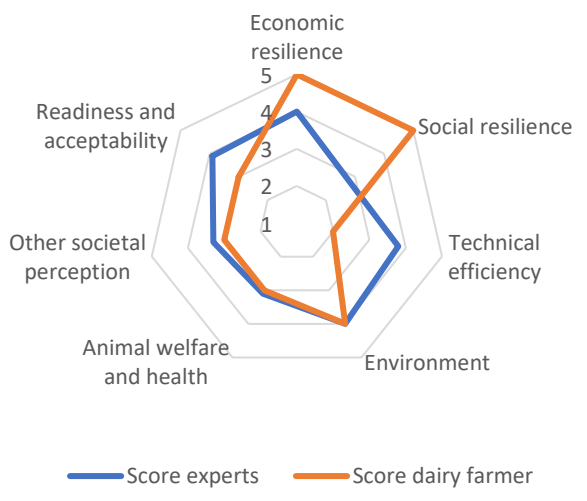
Drying

- Harvesting in good weather at full ripening stage.
- Drying as for cereals.
- Feeding to animals in crushed or ground form.

Crimping

- Harvested in higher moisture, crimped and ensiled in a silo or tube with a silage additive.
- More cost-effective way, saves drying costs.
- Gives flexibility in threshing time and weather conditions.
- Fermentation during preservation reduces the amount of antinutrients in the beans.

Assessment of method



Quote of the farmer:

"I grow beans and peas as a mixture with cereals and crimp and ensile them for cows - maximising benefits and minimising risks"

Resilience 4 for Dairy

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