

Circular Pig Farm of the Future

Designing the circular pig farm of the future: realising collaboration between arable and pig farmers



ACT 2606

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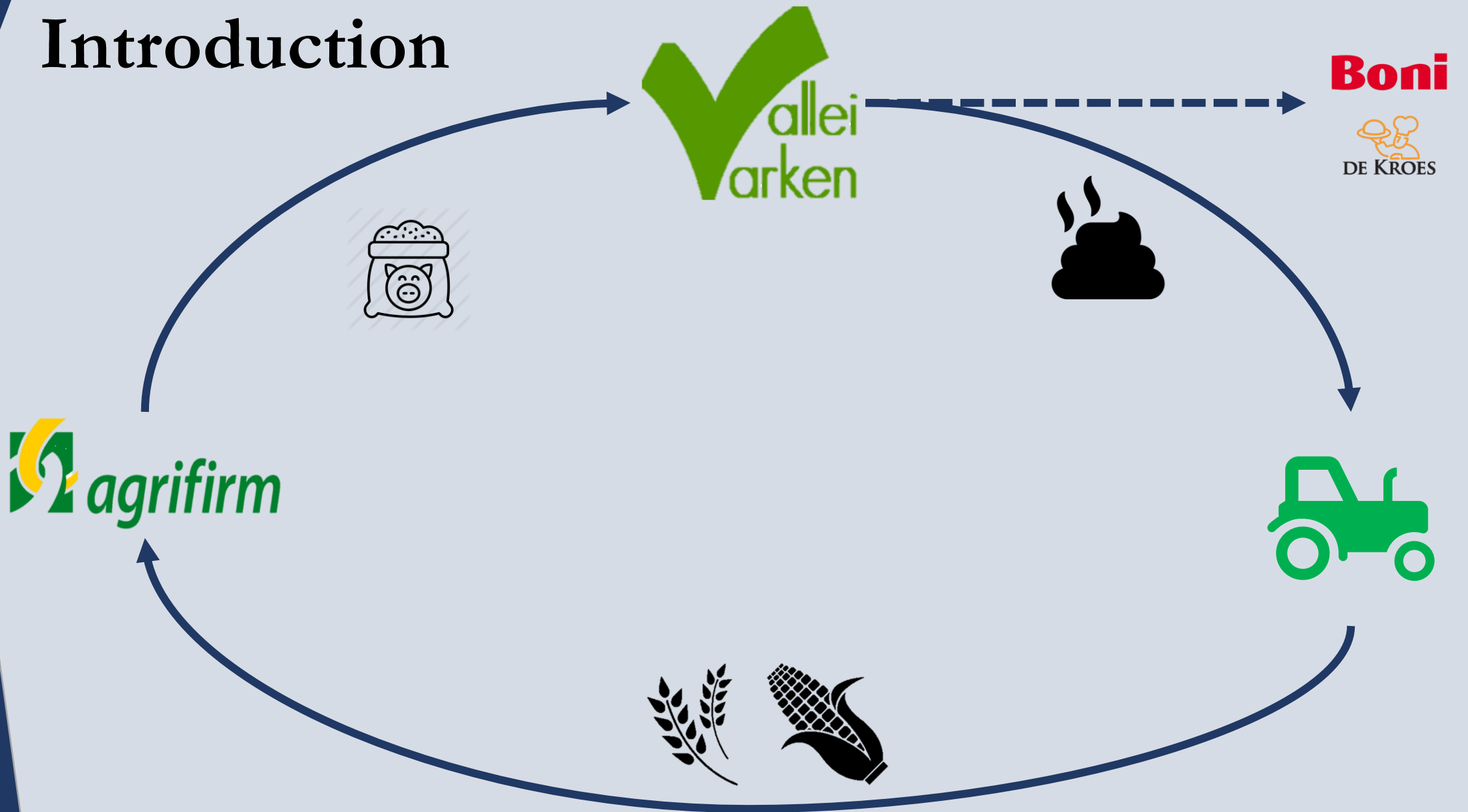
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Introduction

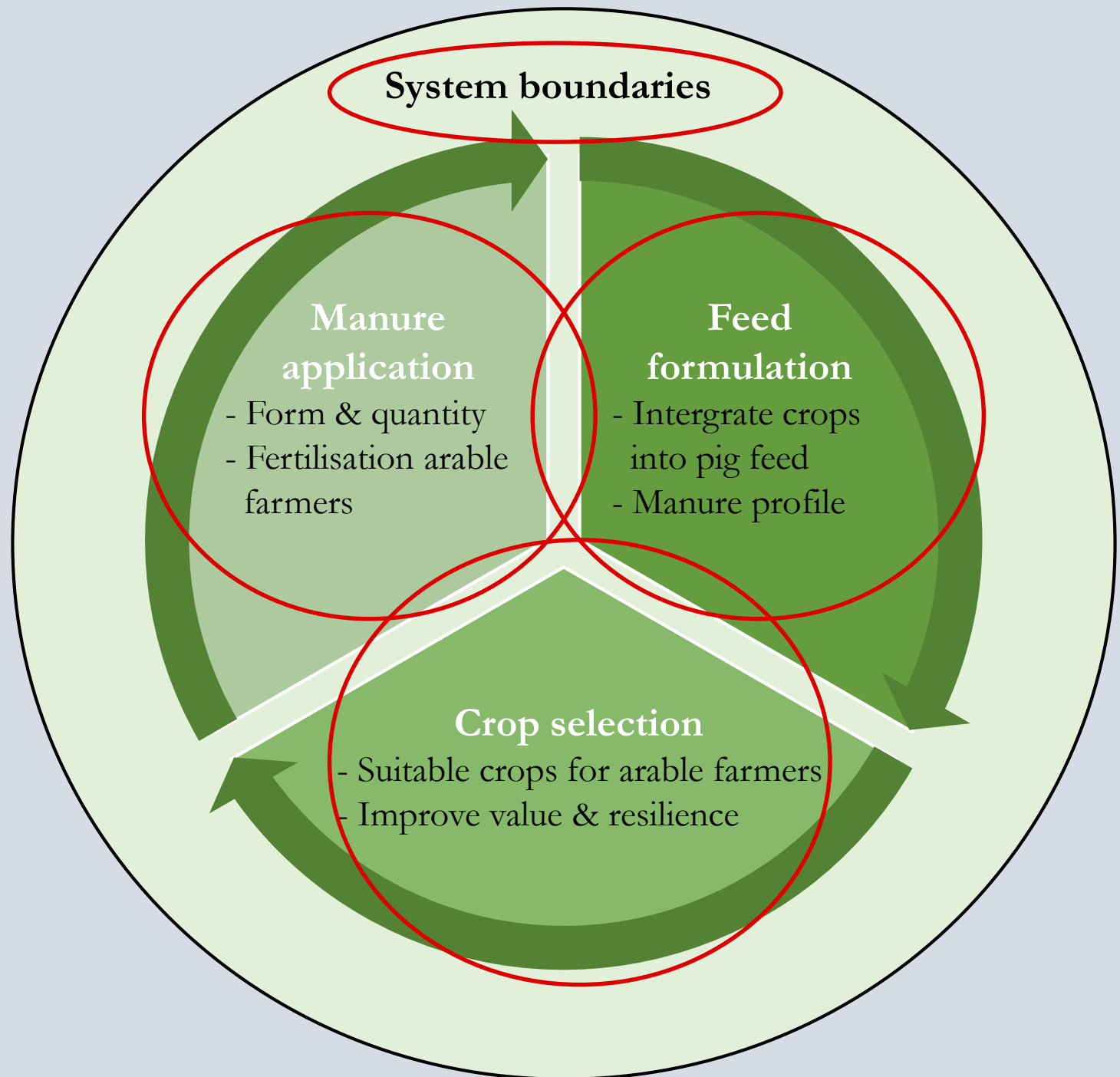


Research question

What are the possibilities to establish a circular collaboration between Vallei Varken and arable farmers based on the exchange of crops as feed and manure as fertiliser?



Sub-questions



Materials & Methods

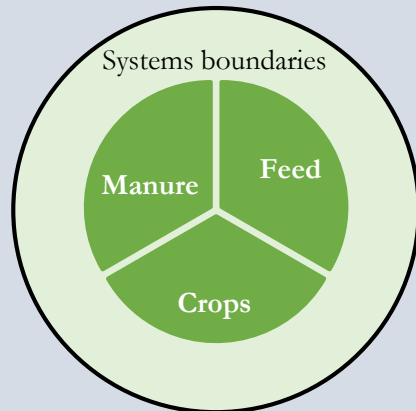


Interviews

In person and online

Semi-structured

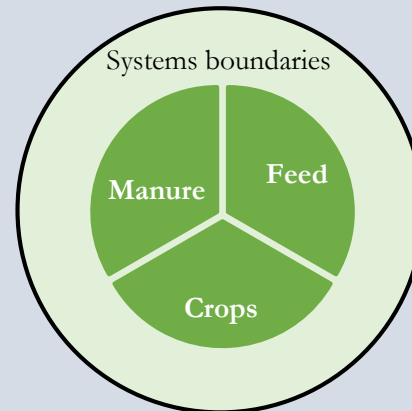
MS Teams/Phone



Literature research

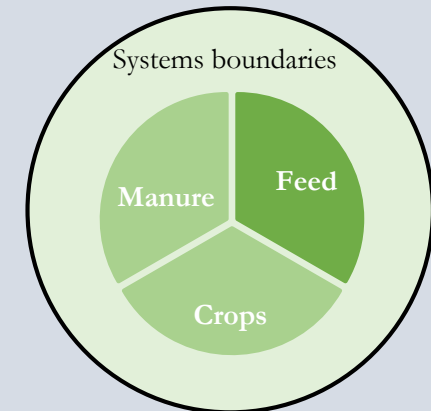
Google scholar

WUR Library



Feed formulation

EvaPig®



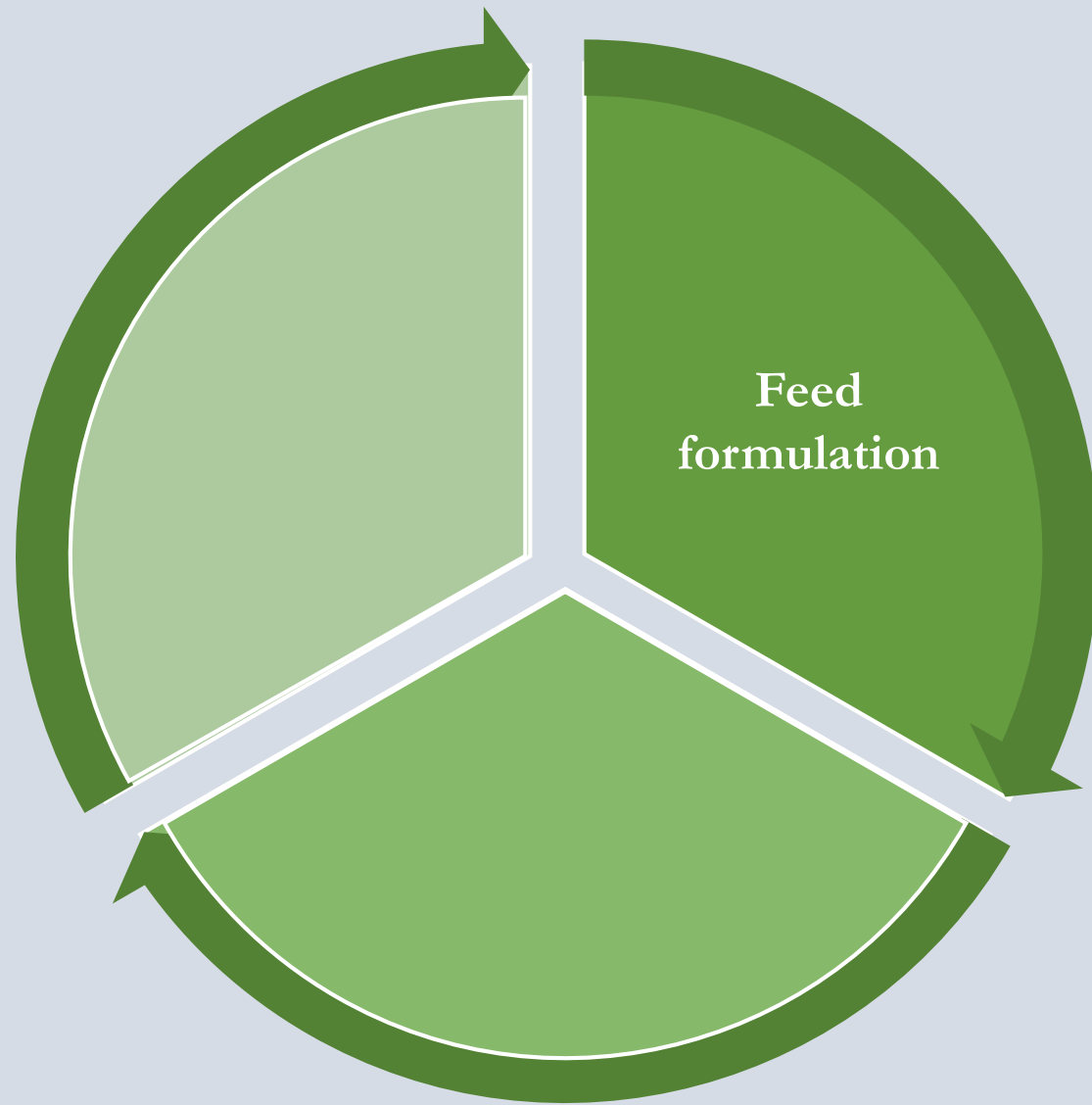
Current system & boundaries

- Boundaries
 - Organisational
 - Practical: feed, crops, manure
 - Financial



Figure 1: Map of stakeholders





Feed formulation



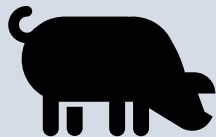
- ✓ Standard pig diet
- ✓ Cereals (EU), soybean meal (LA), by-products



- ✓ Pelleted feed
- ✓ + (by-products)

Nutritional requirements

(Energy, fat, protein, minerals...)



List ingredients

Composition



Feed formulation

Using crops from the arable farms in the feed

1 - Cereals

Wheat, barley, corn

→ Energy sources

+	-
Already done	Land
Local	

2 – Protein crops

Faba beans & peas

→ Protein sources

+	-
Less import	Formulation
	Costs

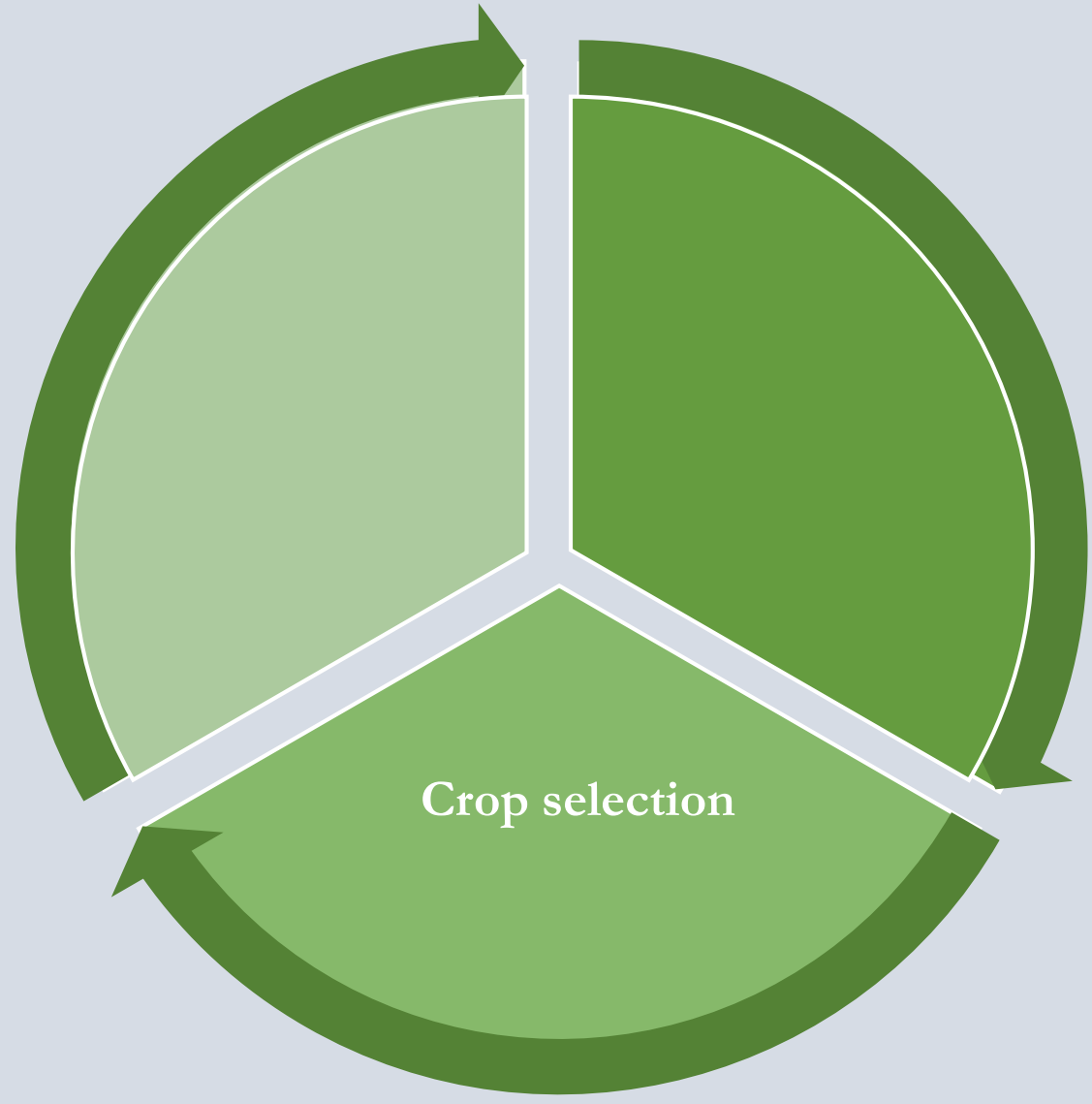
3 – Vegetable by-products

Potato peels & chicory

→ Energy, protein & fibre

+	-
Wastes	Inclusion
Cheap	





Crop selection

- Circularity & crop rotations
- Current situation

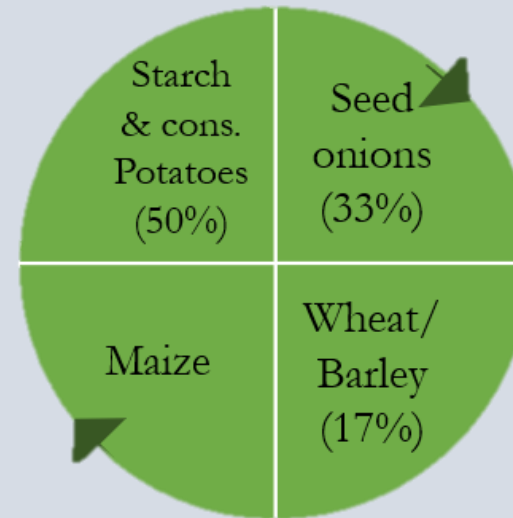
Selection criteria

- ✓ Harvest between July-September
 - ✓ High margin (€/ha)
 - ✓ Produces pig feed
-

Scenario's



AF1 (60ha)



AF2 (110ha)

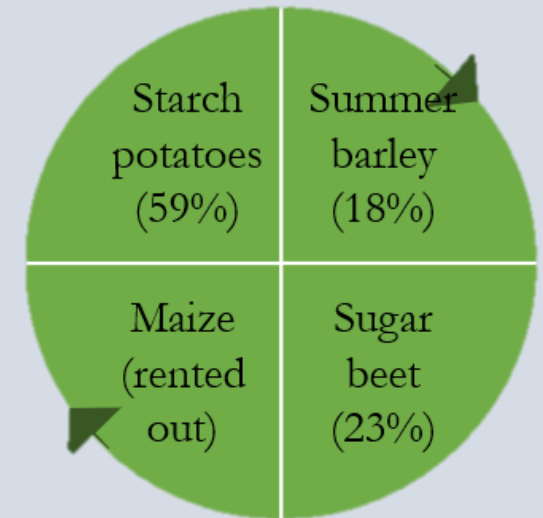


Figure 2: A global representation of the crop rotations of the arable farmers



Crop selection

Growing crops on the arable farms to be used as feed

1 - Cereals

Winter wheat, winter barley & grain maize

+	-
Soil quality	Value
Pig feed	Feed-food competition
Early harvest	
Manure demand	
Expertise	

2 – Protein crops

Pea, faba bean, lupin, flax & rapeseed

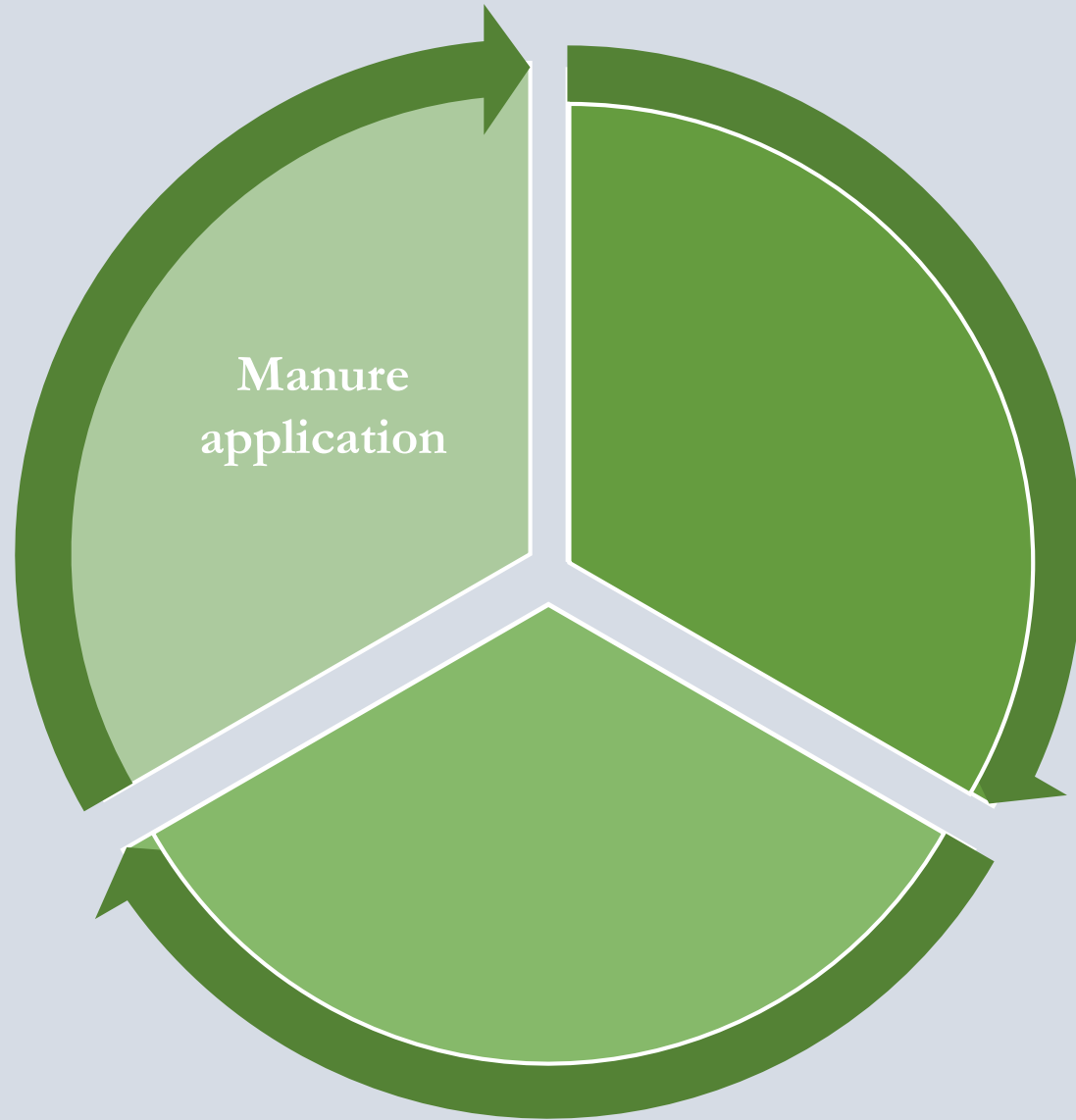
+	-
Soil quality	Value (yield gap)
Pig feed	Knowledge gap
Early harvest	Expertise
Diversification	Feed-food competition

3 – Vegetables

Cabbage, leek, (sweet) potato & seed onion

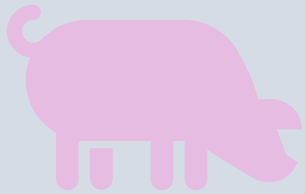
+	-
Value	Soil quality
Manure demand	Pig feed
	Expertise
Feed-food competition	Machinery
	Labour
	Late harvest



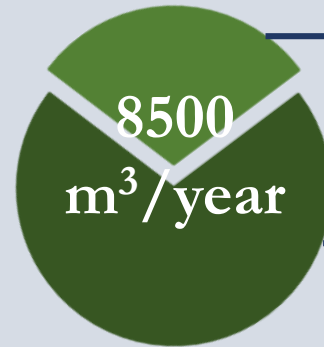


Manure application

Manure → organic fertiliser

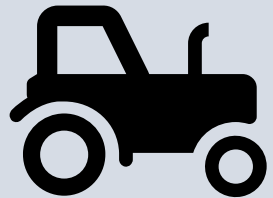


- ✓ 5500 fattening pigs
- ✓ 660 breeding sows

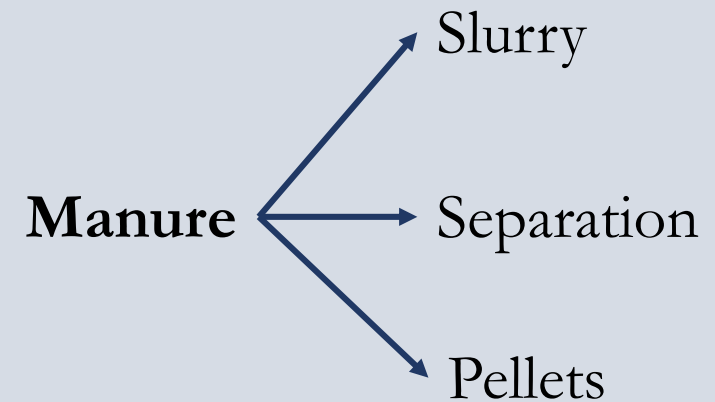


2500 m³ own use

6000 m³ transported



- AF1 - cattle slurry & artificial fertiliser
- AF2 - cattle & pig slurry & digestate



Manure application

Advice on current system

Short-term

VV3 → AF1
Liquid fraction

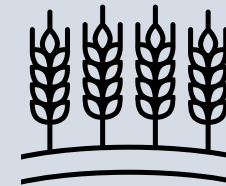
VV1 → AF2
VV2 → AF2
Slurry manure

Long-term

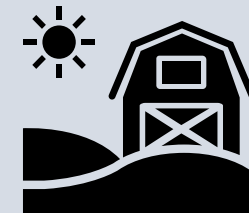
VV1 → Pelleting etc.
VV2 → AF1
Solid fraction
Liquid fraction

Advice on crop scenarios

No particular crops selected: fertilisation is highly situational, therefore no specific advice



Establish crop rotation, perform soil analyses & calculate manure needs



Collaborative framework (2)

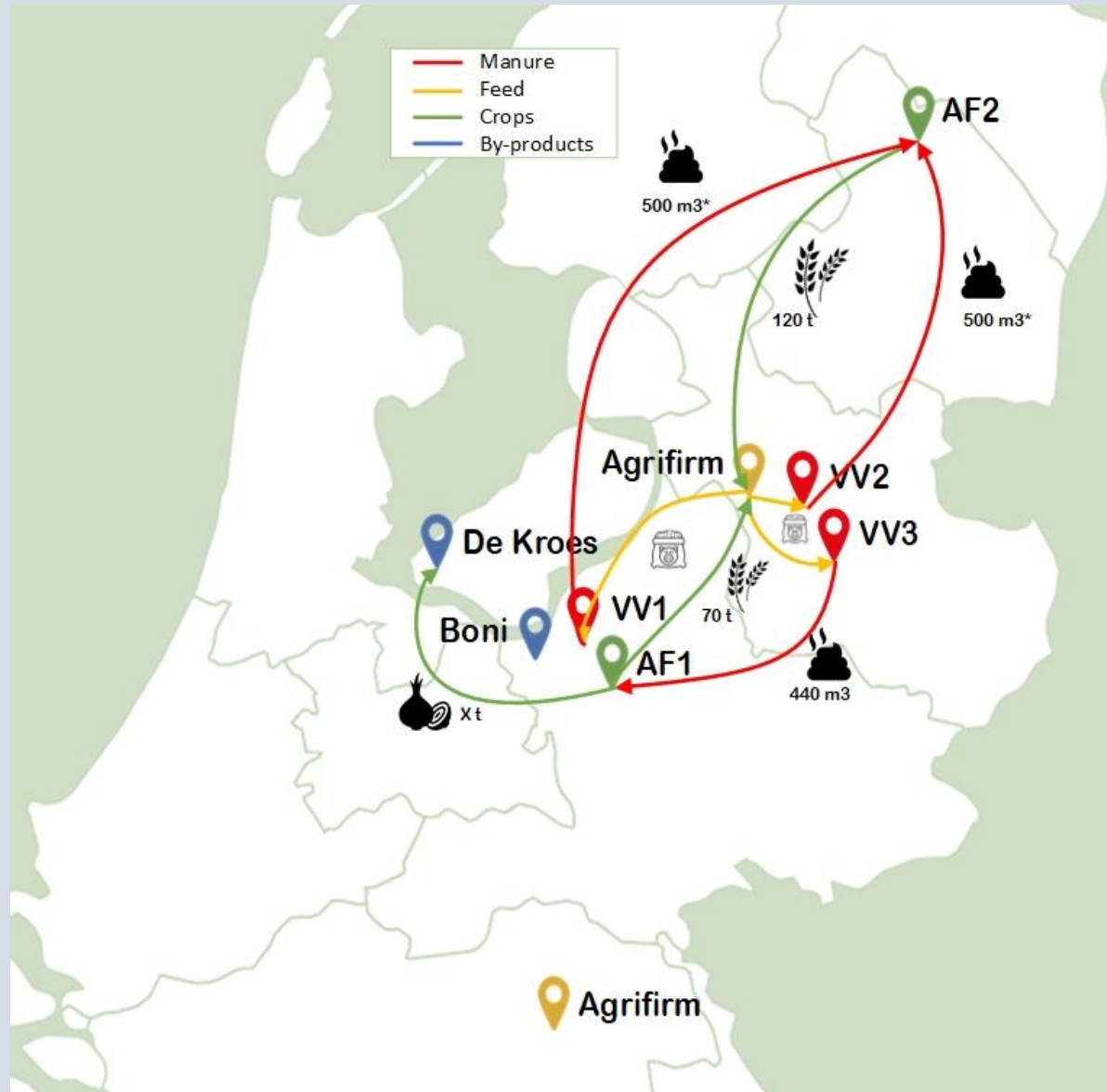


Figure 4: Map of transport flows between stakeholders



Long-term advice

- VV1 or VV2 → Manure separation
 - Future → pellets
- Gather knowledge on growing legumes & new vegetables
- Vegetables for De Kroes
- Involve other arable farmers
- Consider processing crops on farm



Conclusion

What are the possibilities to establish a circular collaboration between Vallei Varken and arable farmers based on the exchange of crops as feed and manure as fertiliser?

- Multiple options for collaboration
- Next step → use advice & establish most suitable collaboration



Questions?

