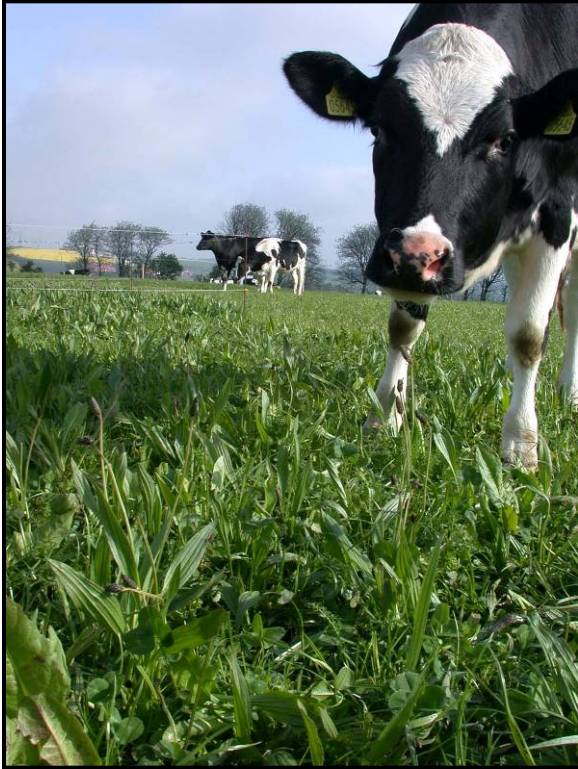


Multispecies grassland for crop productivity and carbon storage



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Potential benefits of multispecies grasslands



- Yield
- Feed quality
- Appetite
- Animal health
- Mineral availability
- Conditions for pollinators
- Carbon storage
- Product quality
- Marketing



Experimental

Objective

Inclusion of herb mixture in grass-clover leys

Hypotheses

1. Increased persistence of swards
2. Increased potential for carbon storage through increased and deeper root growth



Experimental

Seed mixtures	100% herbs	Salad burnet, fenugreek, chicory, caraway, birdsfoot trefoil, chervil, lucerne, melilot and English plantain
	50% herbs	50% herb mixture + 50% grass-clover mixture
	5% herbs	5% herb mixture + 95% grass-clover mixture
Cutting frequency	4 vs. 6 cuts per growing season	
Slurry application	0 vs. 200 kg total N ha ⁻¹	



Experimental

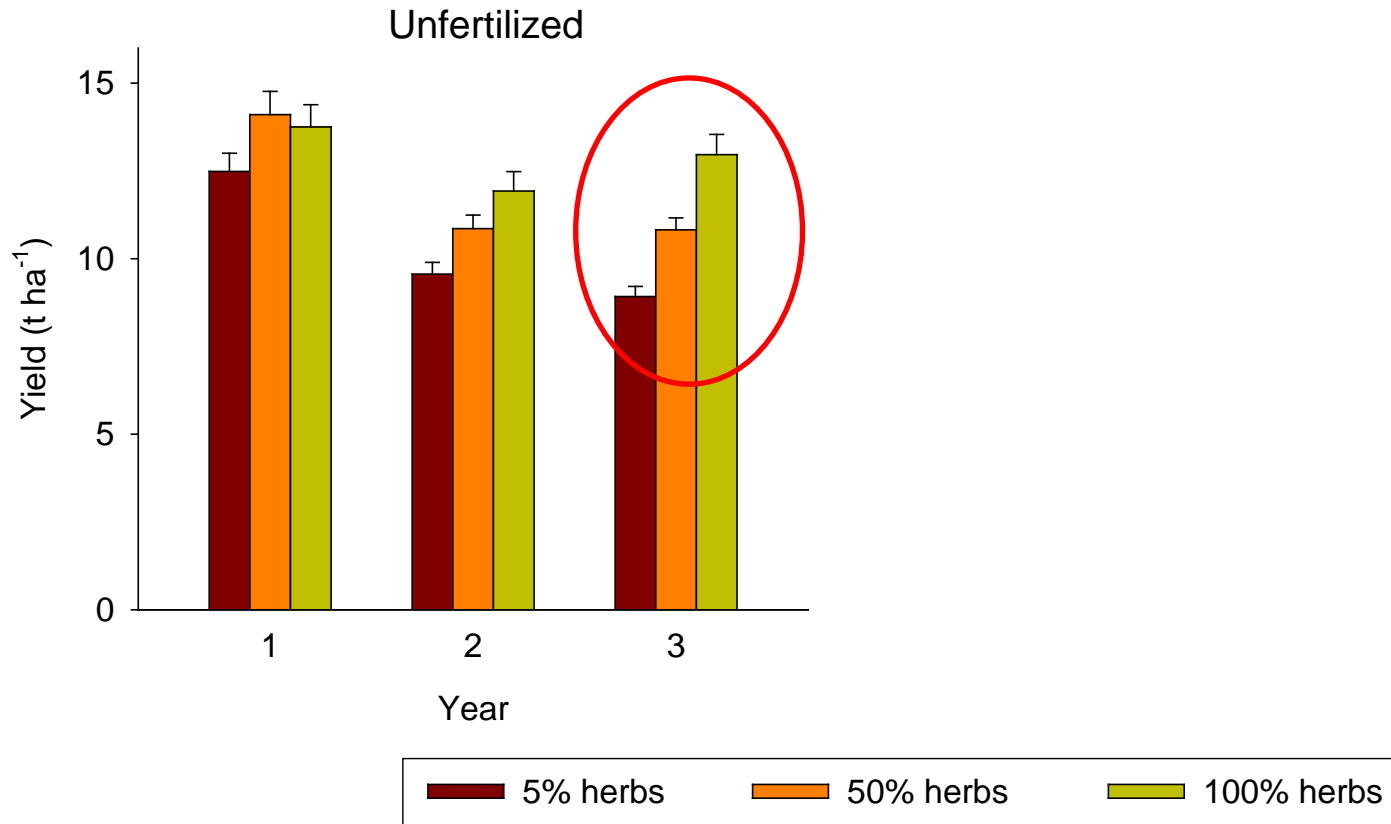
1. Harvest yield and botanical composition in three years
2. Root biomass
3. Simulated ploughing (CO_2 evolution over 226 days)





Aboveground biomass

4 cuts per year

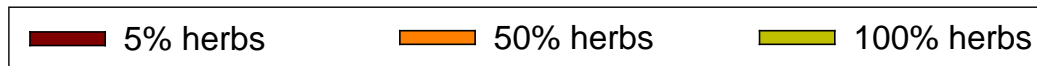
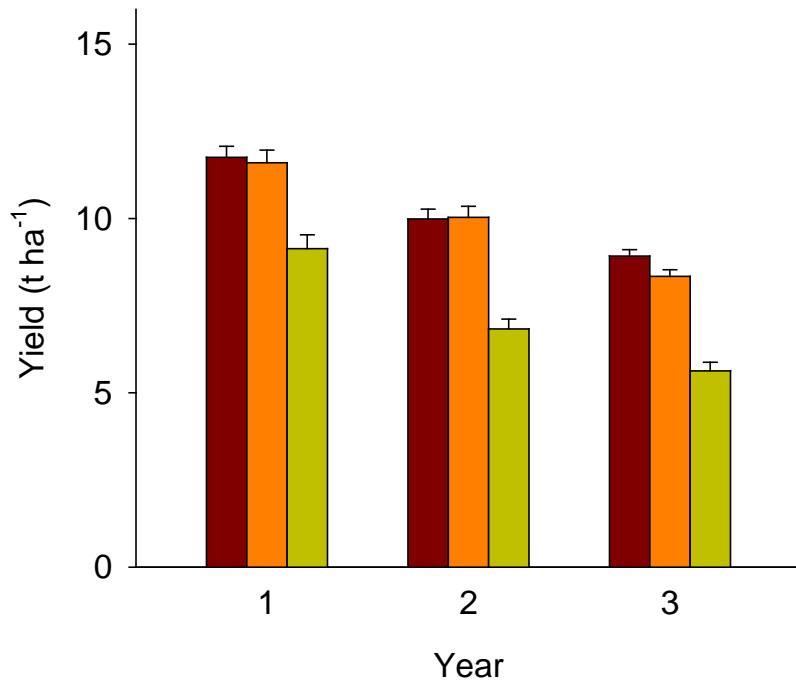




Aboveground biomass

6 cuts per year

Unfertilized

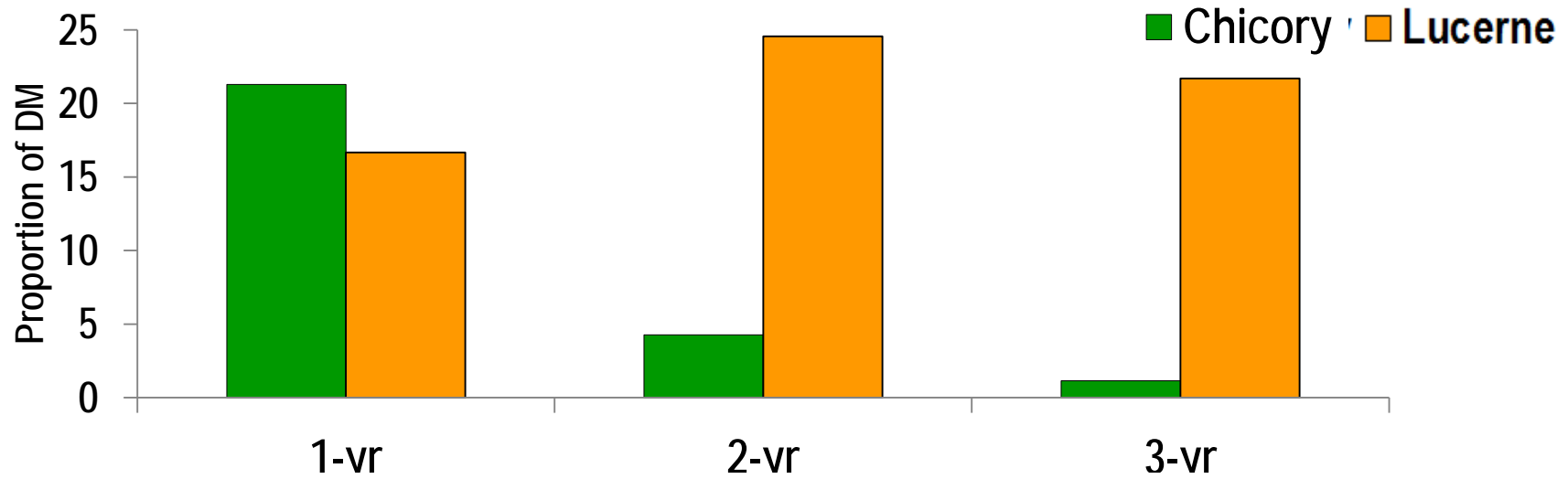
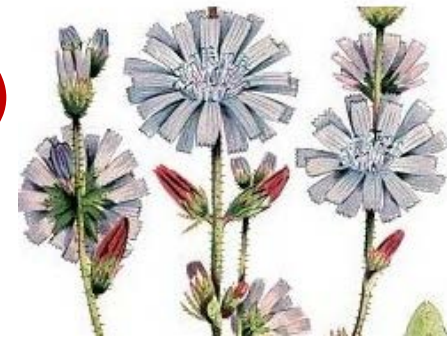


Competitiveness of species

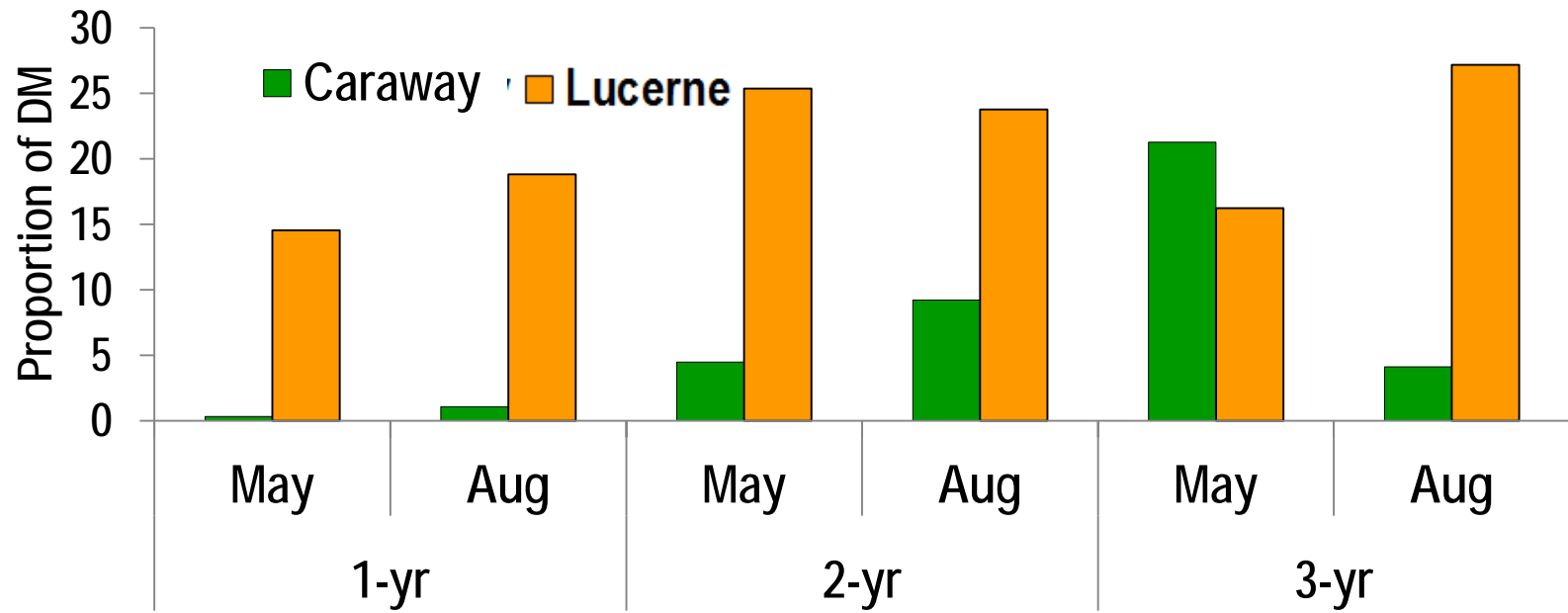
		Herbs in mixture		
		5%	50%	100%
Dominant	Perennial ryegrass	42	29	
	White clover	53	31	
	Lucerne	1.0	20	42
	Chicory	2	10	19
	Caraway	0.7	3	13
Intermediate	English plantain	1.1	5	8
	Birdsfoot trefoil	0.1	0.9	7
	Salad burnet	0.1	0.5	3
Weak	Melilot	0	0.2	0.7
	Chervil	0	0	0
	Fenugreek	0	0	0



Chicory (*Chicorium intybus* L.)

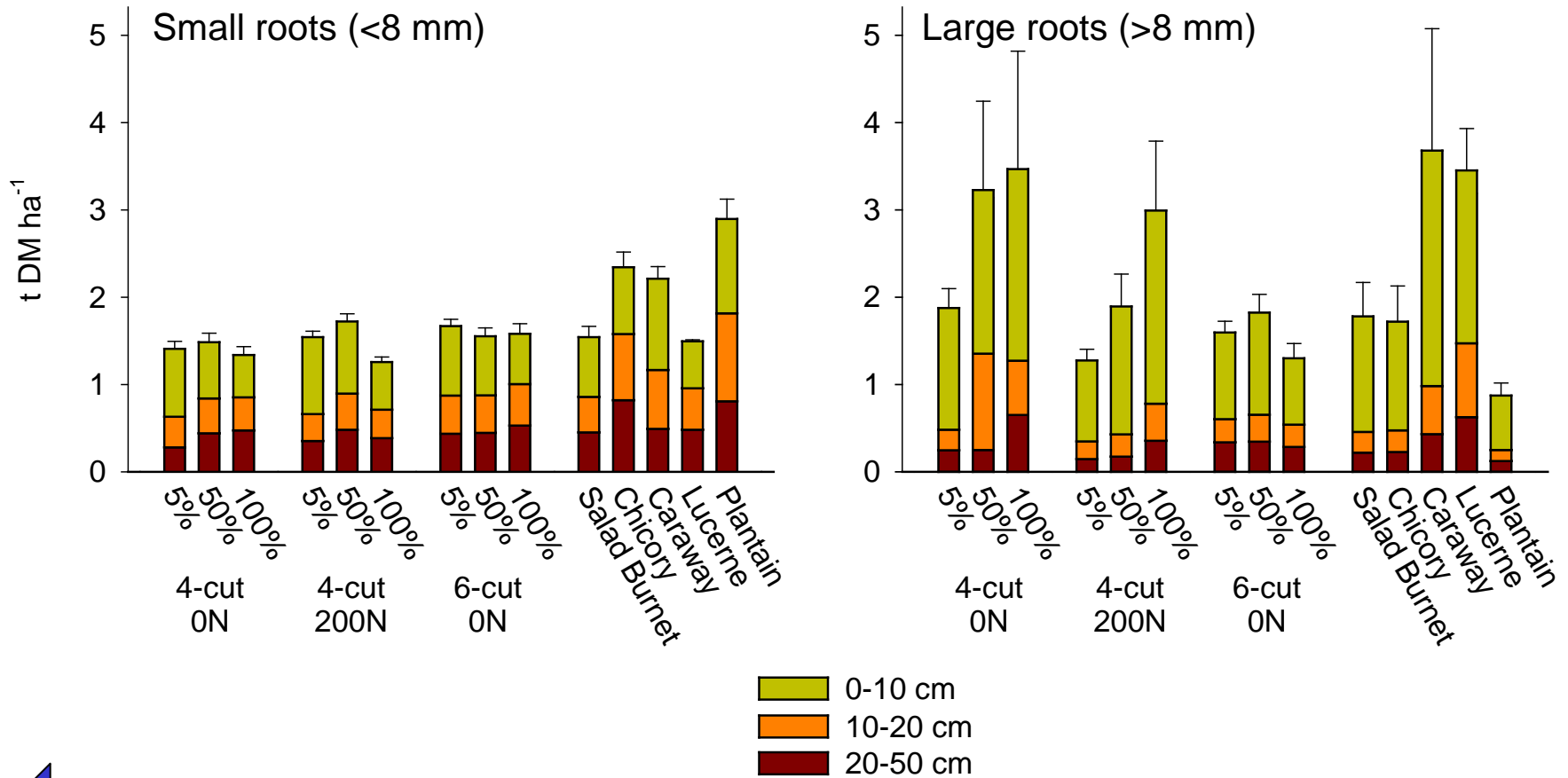


Caraway (*Carum carvi* L.)

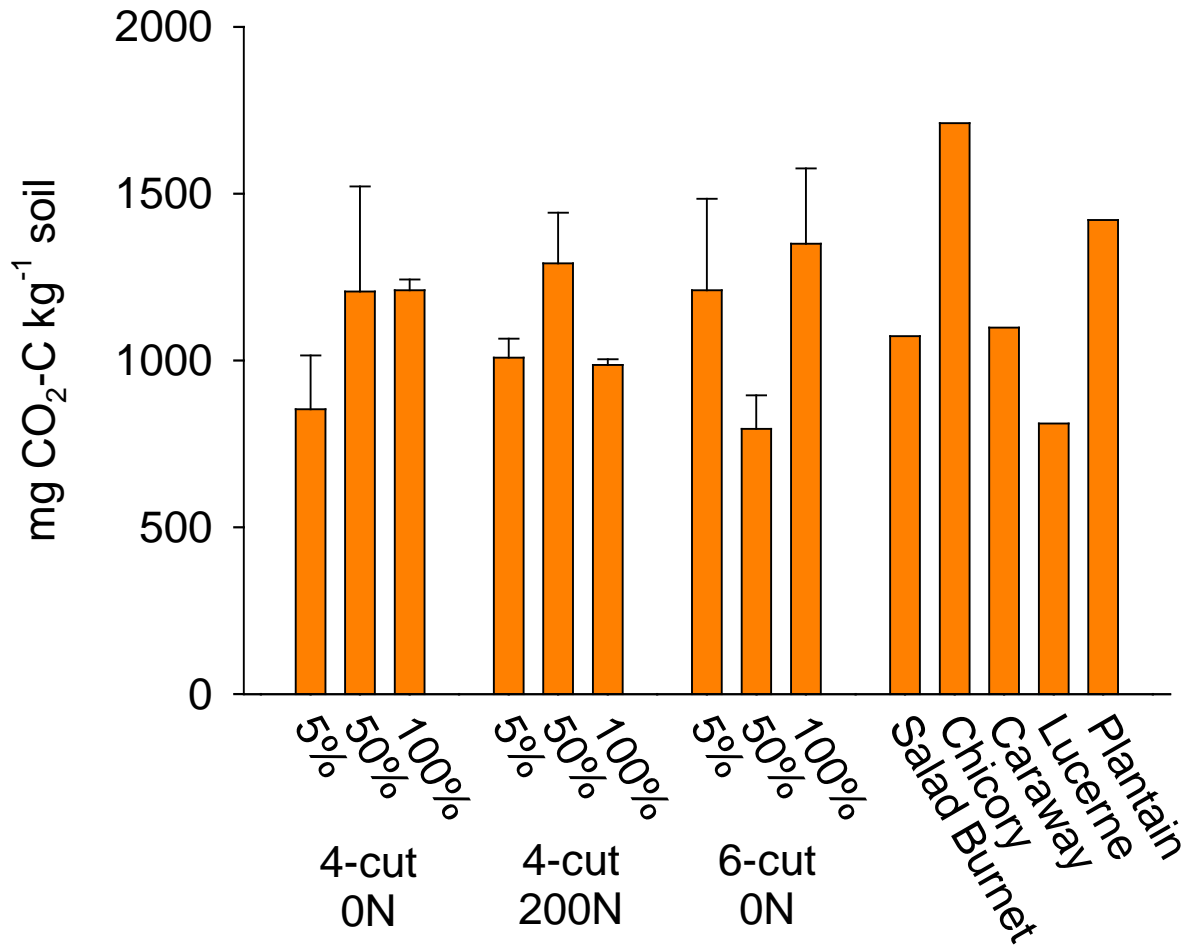




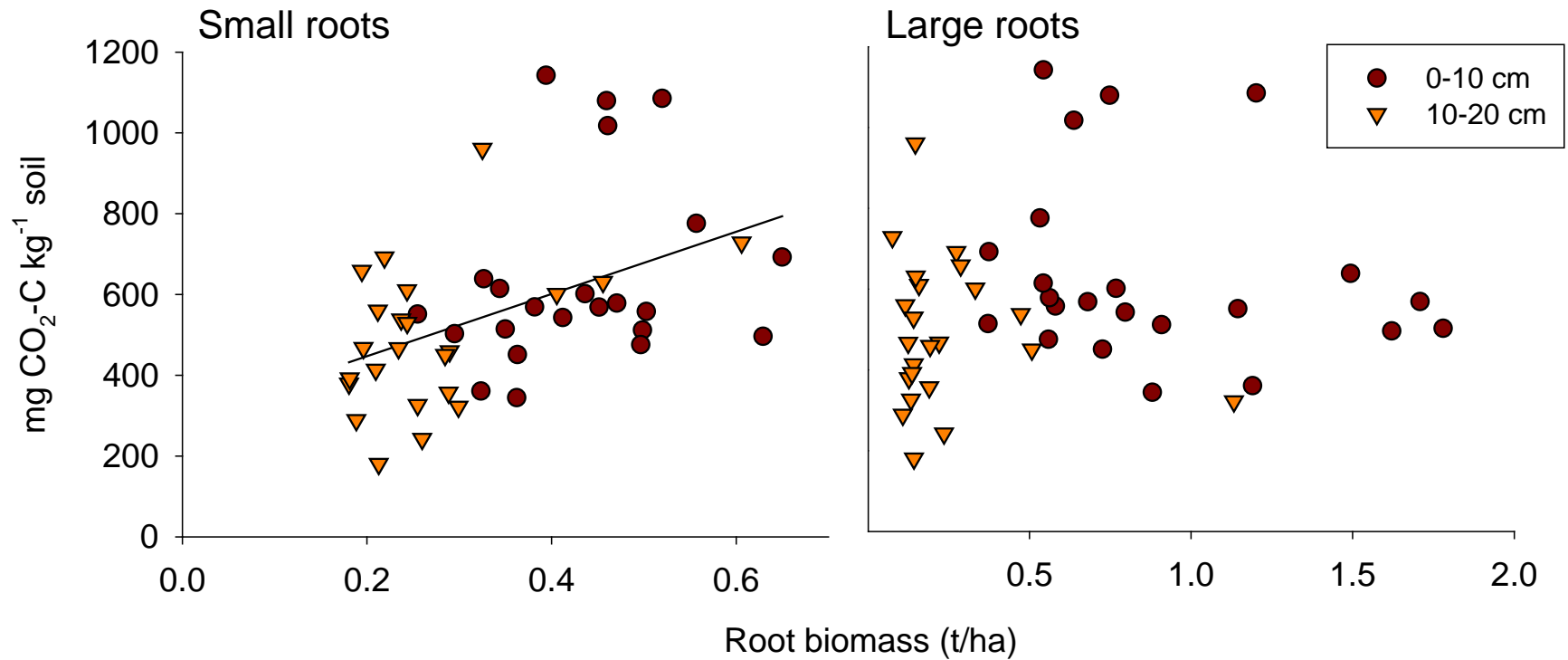
Belowground biomass



CO₂ evolution following "ploughing"



CO₂ evolution following "ploughing"



Conclusions

Multispecies mixtures

- Increases yield stability (management dependent)
- Potential to increase belowground biomass and C storage
- Dependency on few driver species



Perspectives

Multi-functionality

- Dairy farming systems:
Productivity, C storage, pollinators, product quality, marketing
- Stockless organic farming:
Low input – high yield perennial crops for bioenergy, protein or quality feed.
Weed control, nutrient input, sales products



Thanks for your attention!

