Potentially peat-forming biomass and nutrient removal potential of fen sedges increase with increasing nutrient levels

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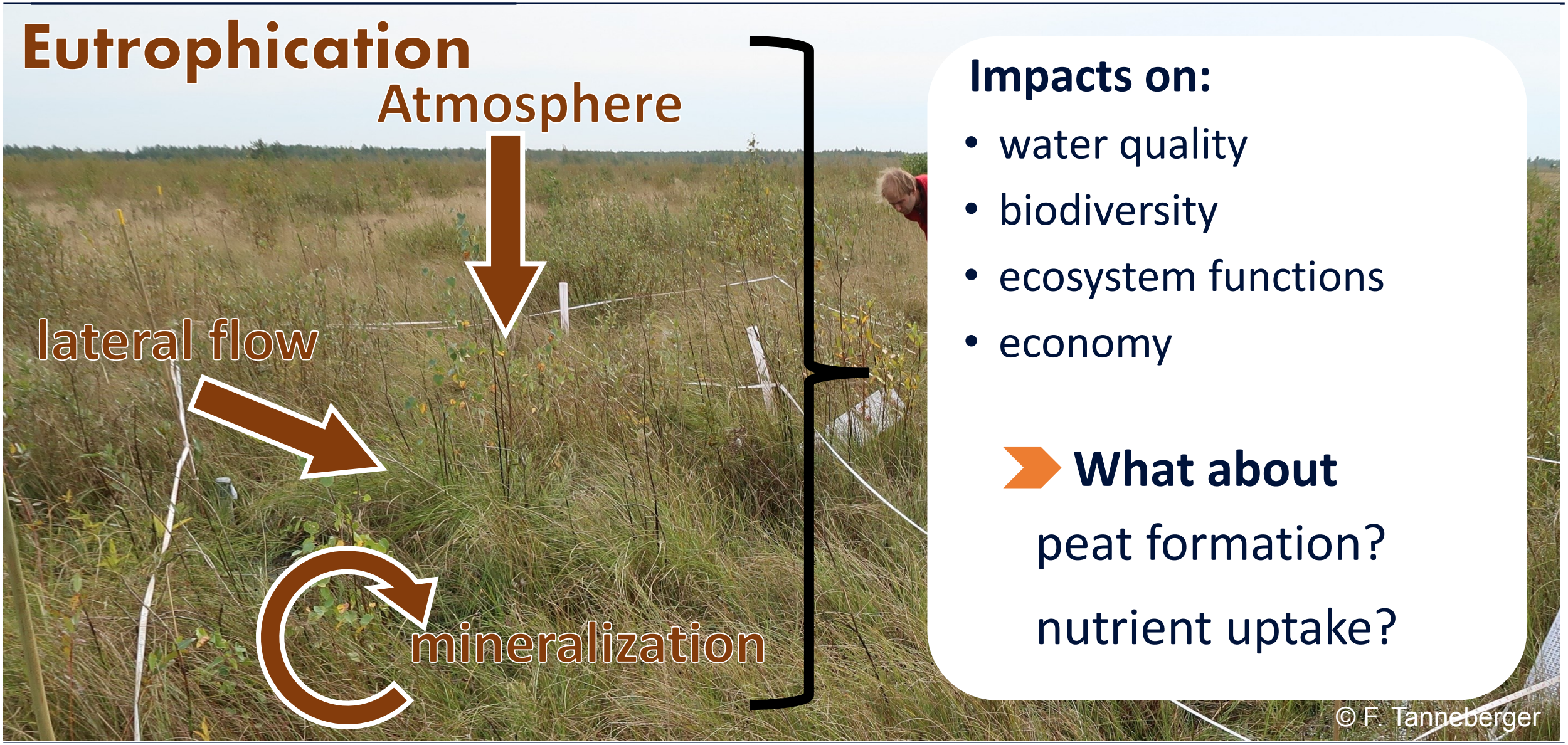
RRR2021, 10.03.2021

Fen eutrophication



Impacts on:

- water quality
- biodiversity
- ecosystem functions
- economy

What about

peat formation?

nutrient uptake?

Hypotheses/Questions

With increasing nutrient level:

- biomass increase – mainly above-ground
- increasing decomposability

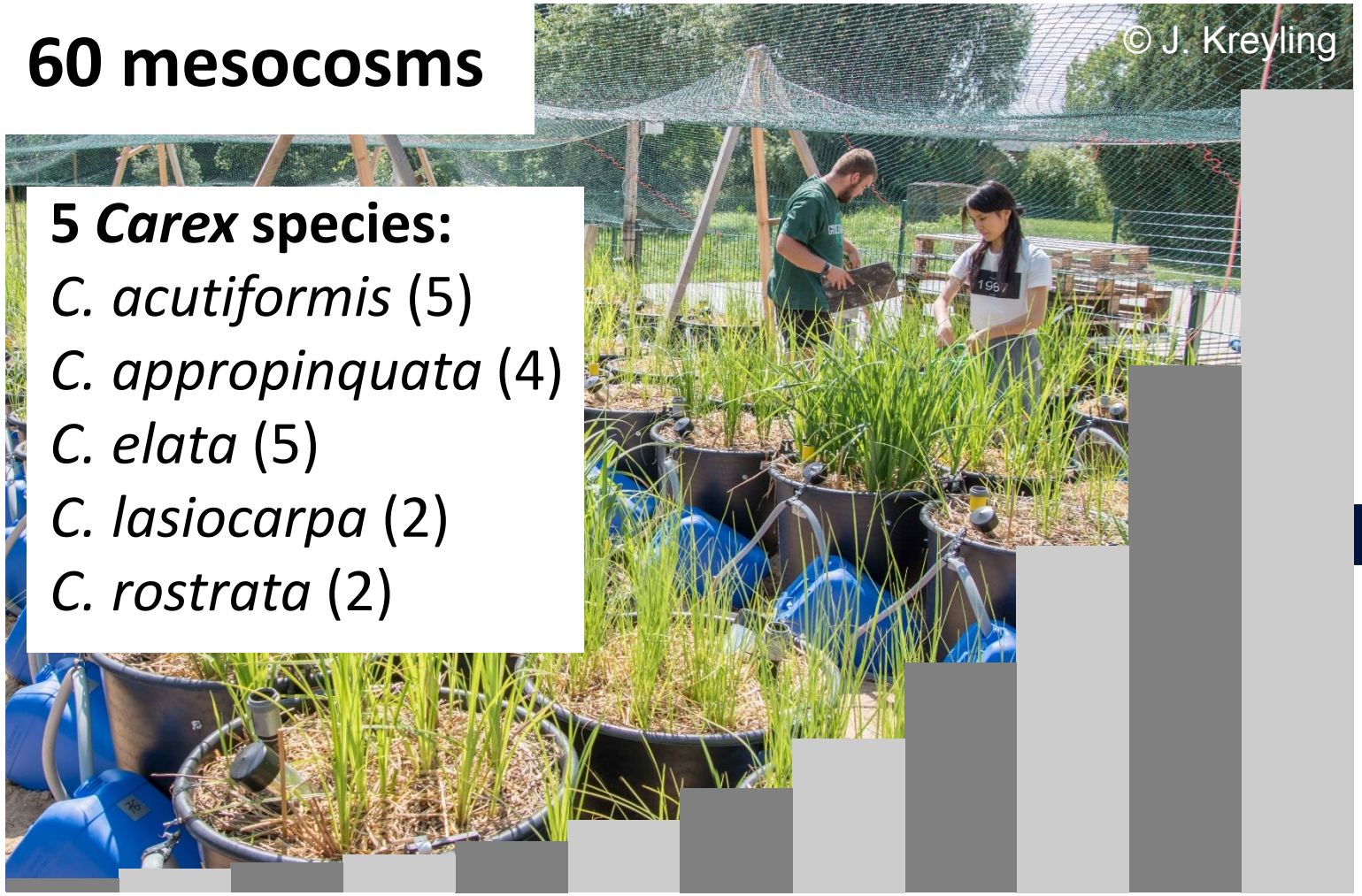
} decreasing potentially peat-forming root biomass

- increase in absolute nutrient uptake
- decrease in relative nutrient uptake

} Is harvest suitable to counteract eutrophication? If so, for which species?

Eutrophication – peat formation and nutrient uptake

60 mesocosms



5 *Carex* species:

C. acutiformis (5)

C. appropinquata (4)

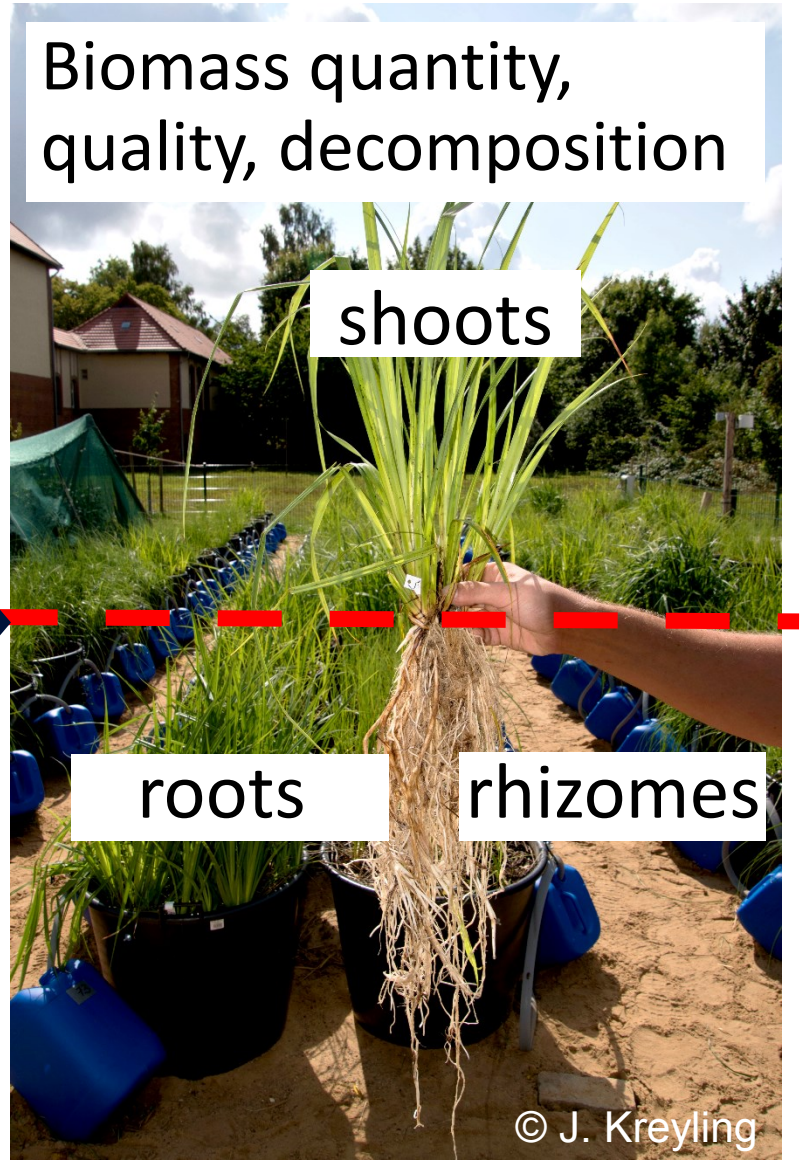
C. elata (5)

C. lasiocarpa (2)

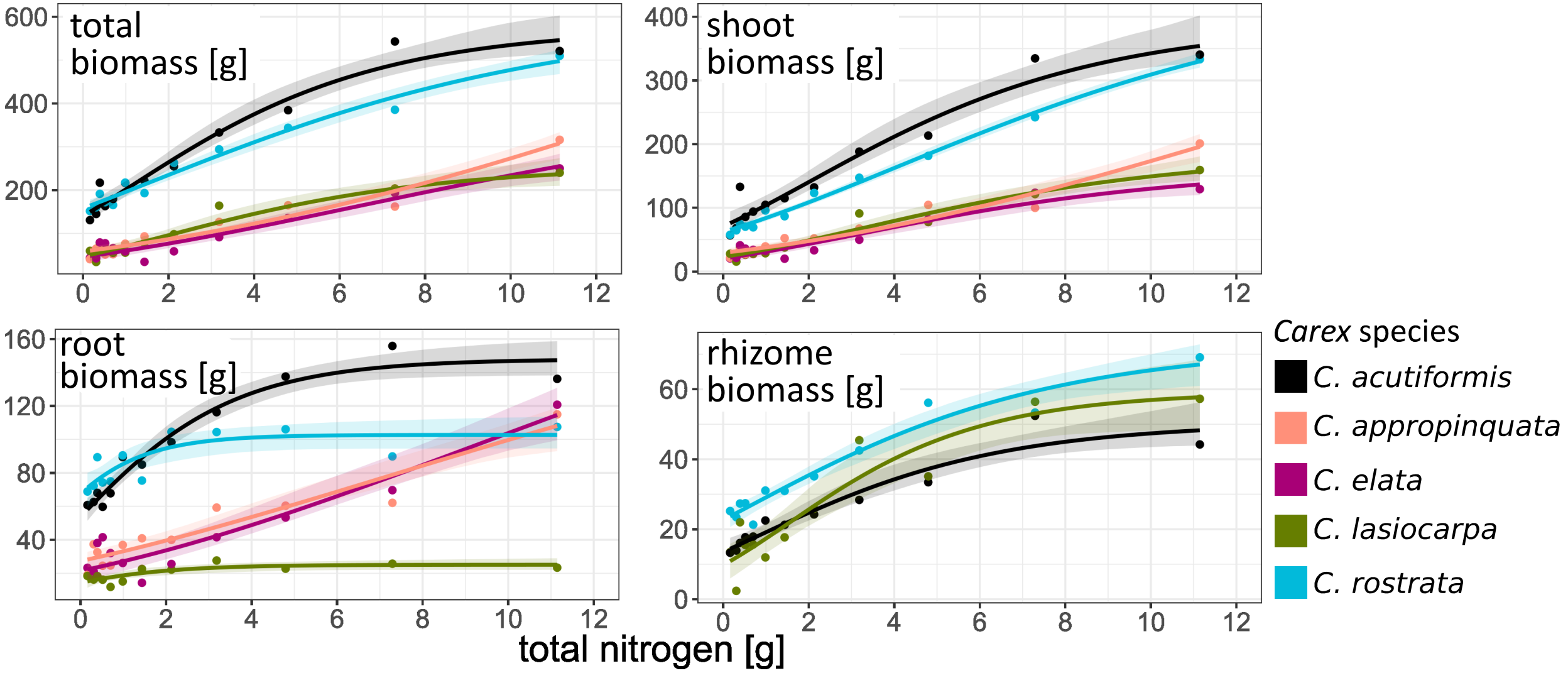
C. rostrata (2)

12 nutrient levels total N [g m^{-2}]

Biomass quantity, quality, decomposition



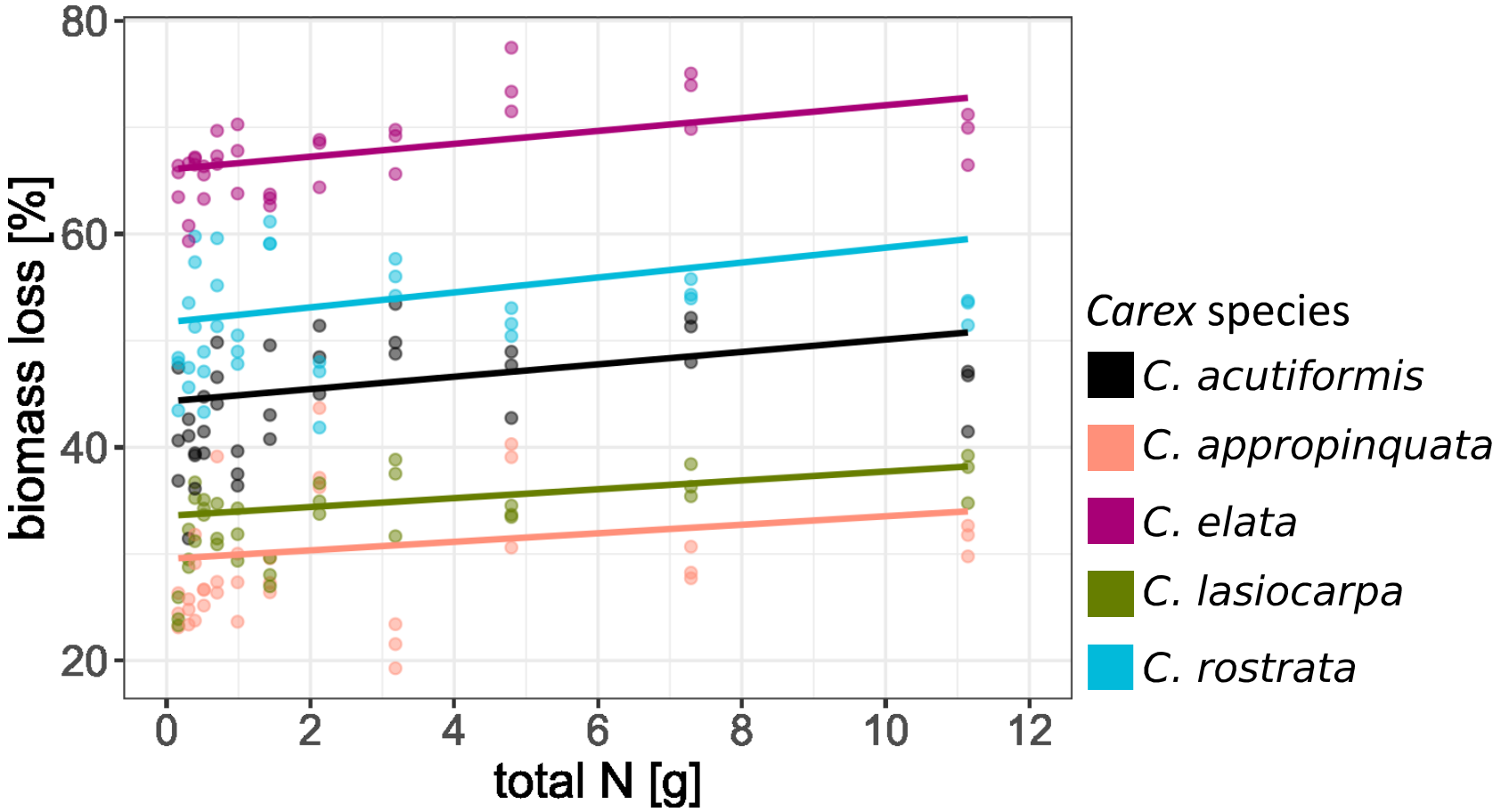
Biomass production



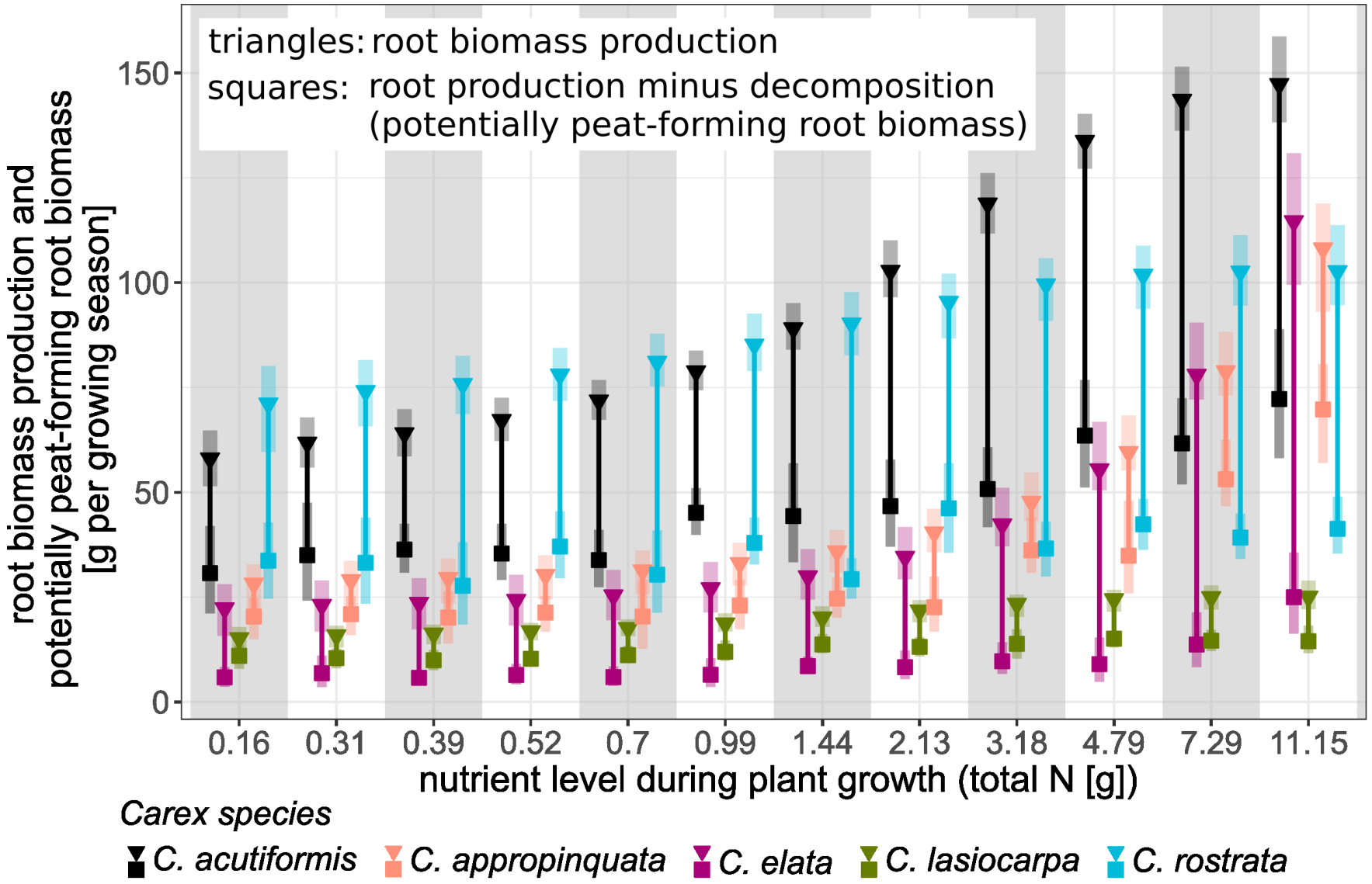
Root decomposability

important for root decomposability:

- species
- total nitrogen
- lignin:cellulose ratio
- Ca content
- Mg content

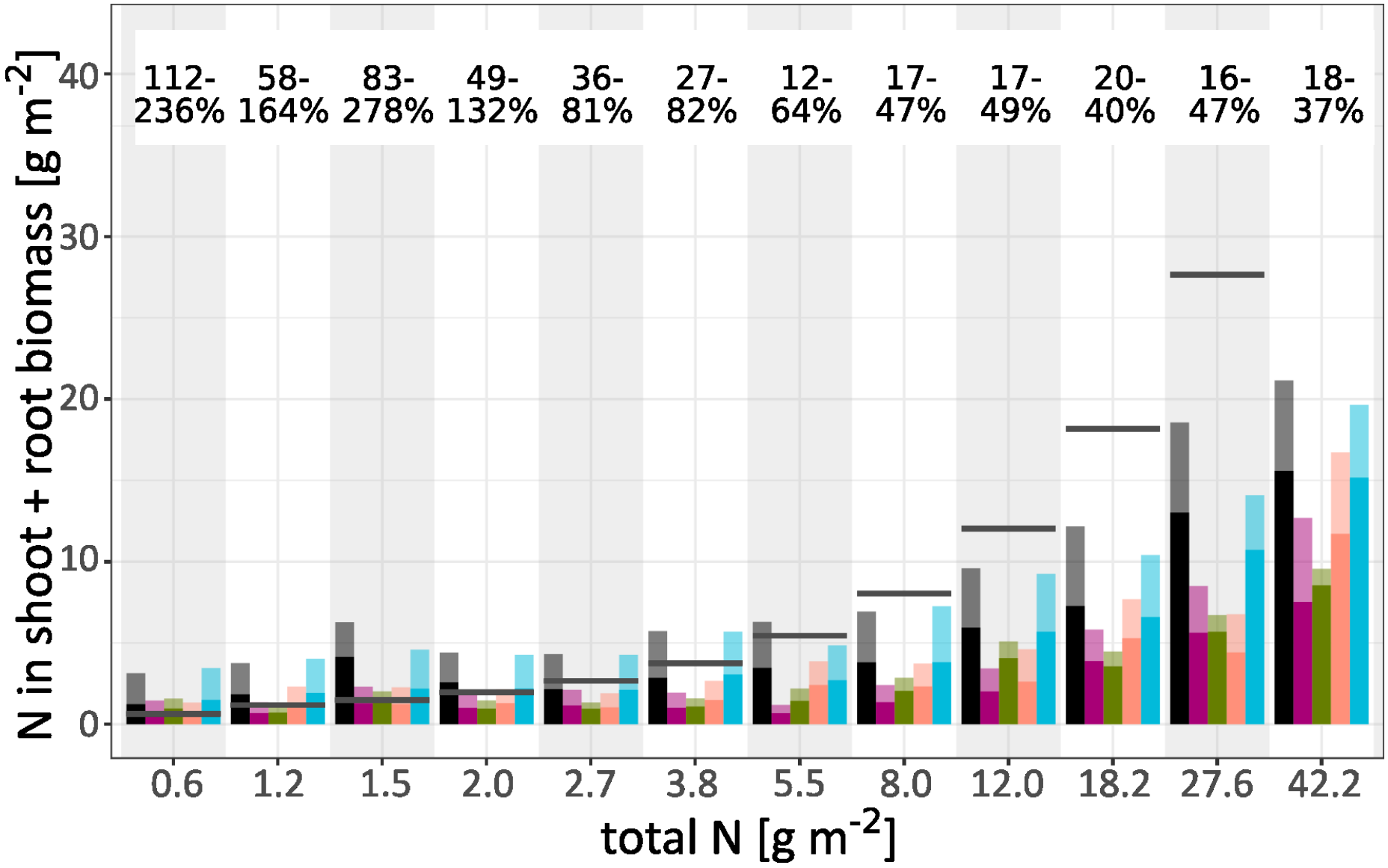


Carex potentially peat-forming root biomass



potential for peat formation also under eutrophic conditions

Carex nitrogen removal potential



Carex species

- *C. acutiformis*
- *C. appropinquata*
- *C. elata*
- *C. lasiocarpa*
- *C. rostrata*

solid: shoot

semi-transparent: root

Conclusions

With increasing nutrient level:

- ✓ biomass increase – mainly above-ground
- ✓ increasing decomposability

} **in**creasing potentially peat-forming root biomass

- ✓ increase in absolute nutrient uptake
- ✓ decrease in relative nutrient uptake

} Harvest can be suitable (site- and management-dependent)

> *C. acutiformis, C. rostrata*

Acknowledgements

Ilka Beil, Gesche Blume-Werry, Sascha Bock, Hans Joosten, Laurenz Teuber, Manuel Ewen, Harald Biester, Johan Rydberg

all helpers of the mesocosm experiment

all members of the **REPEAT** team