

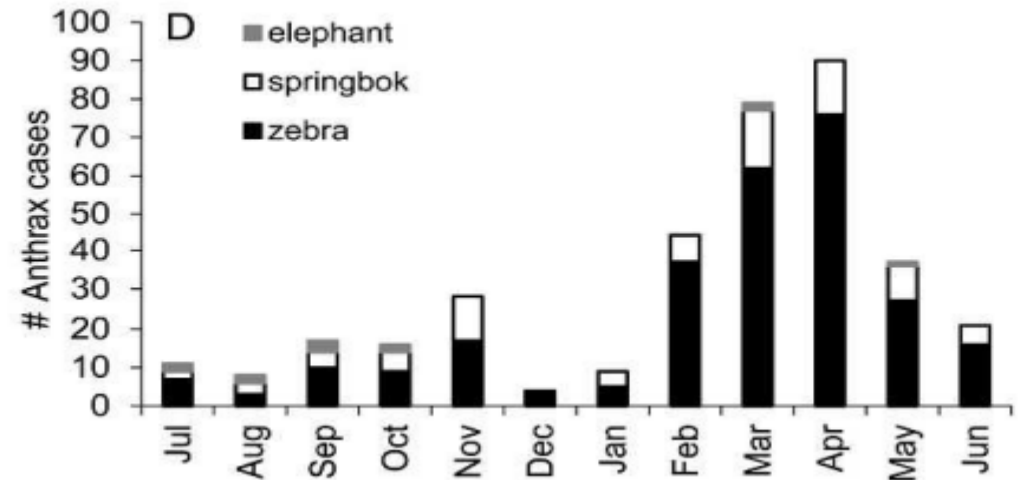
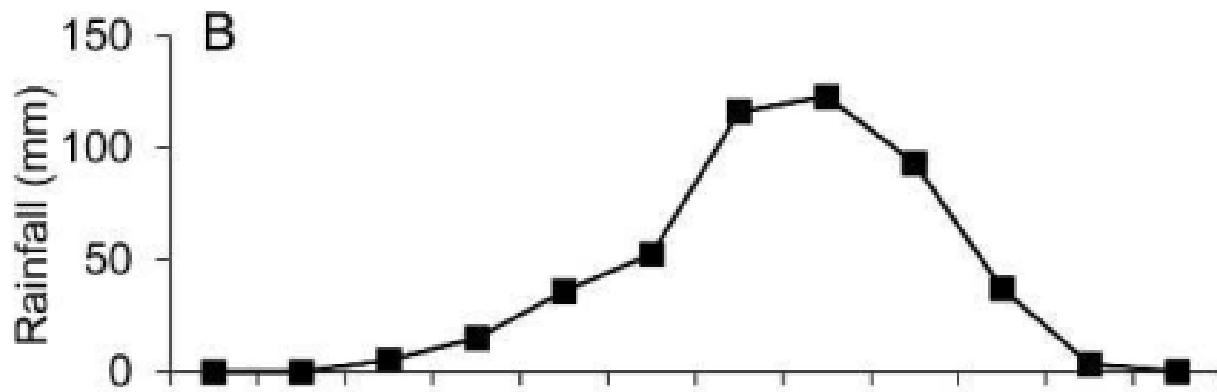
# Exploring disease dynamics in diverse savanna herbivore communities

Donaldson, J. E., Ezenwa, V. O., Anderson, T. M., Morrison, T. A., Hopcraft, J. G. C., McIntyre, J., Devaney, E., Hempson, G. P., Kimaro, H. S., Senso, B., Trentinus, A., Sabuni, P. & Holdo, R. M.

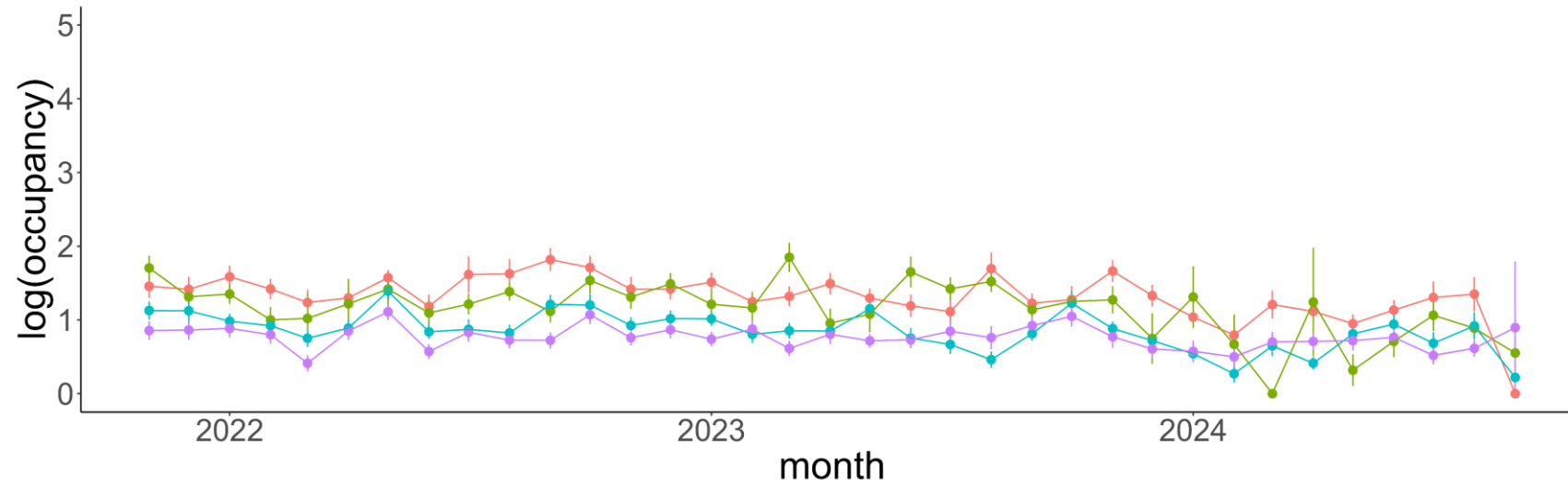


# Seasonal fluctuations in savanna systems

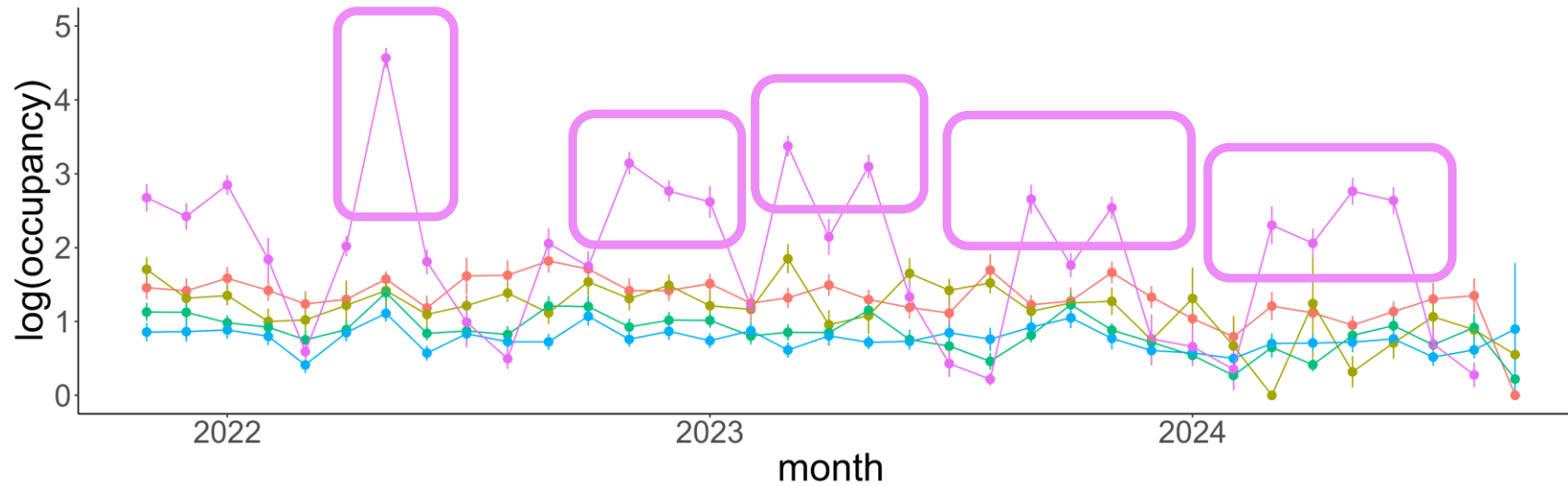
## Disease dynamics



# Animal migrations as seasonal disease drivers



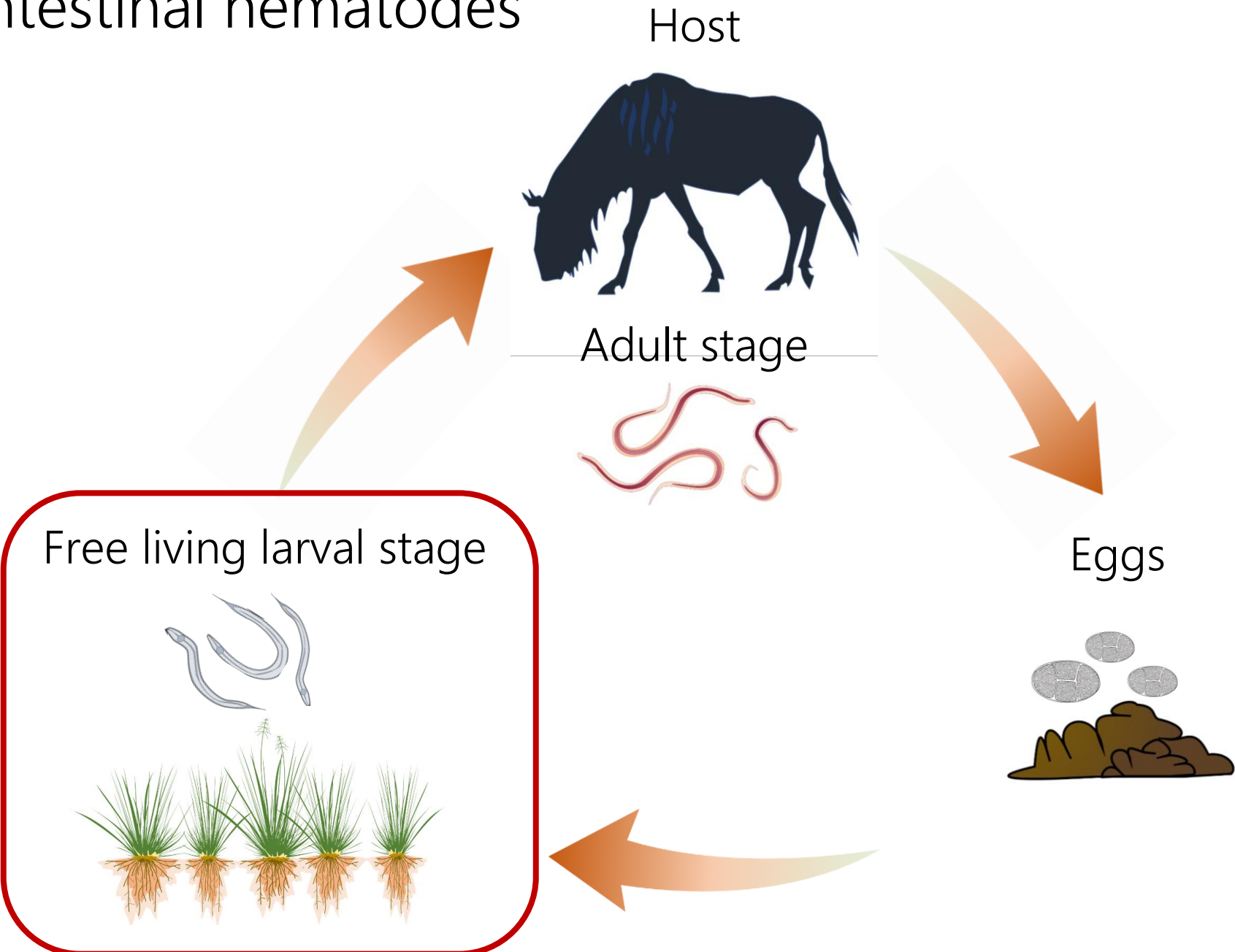
# Animal migrations as seasonal disease drivers



Do migrations interact with seasonal conditions to change infection risk across the landscape?

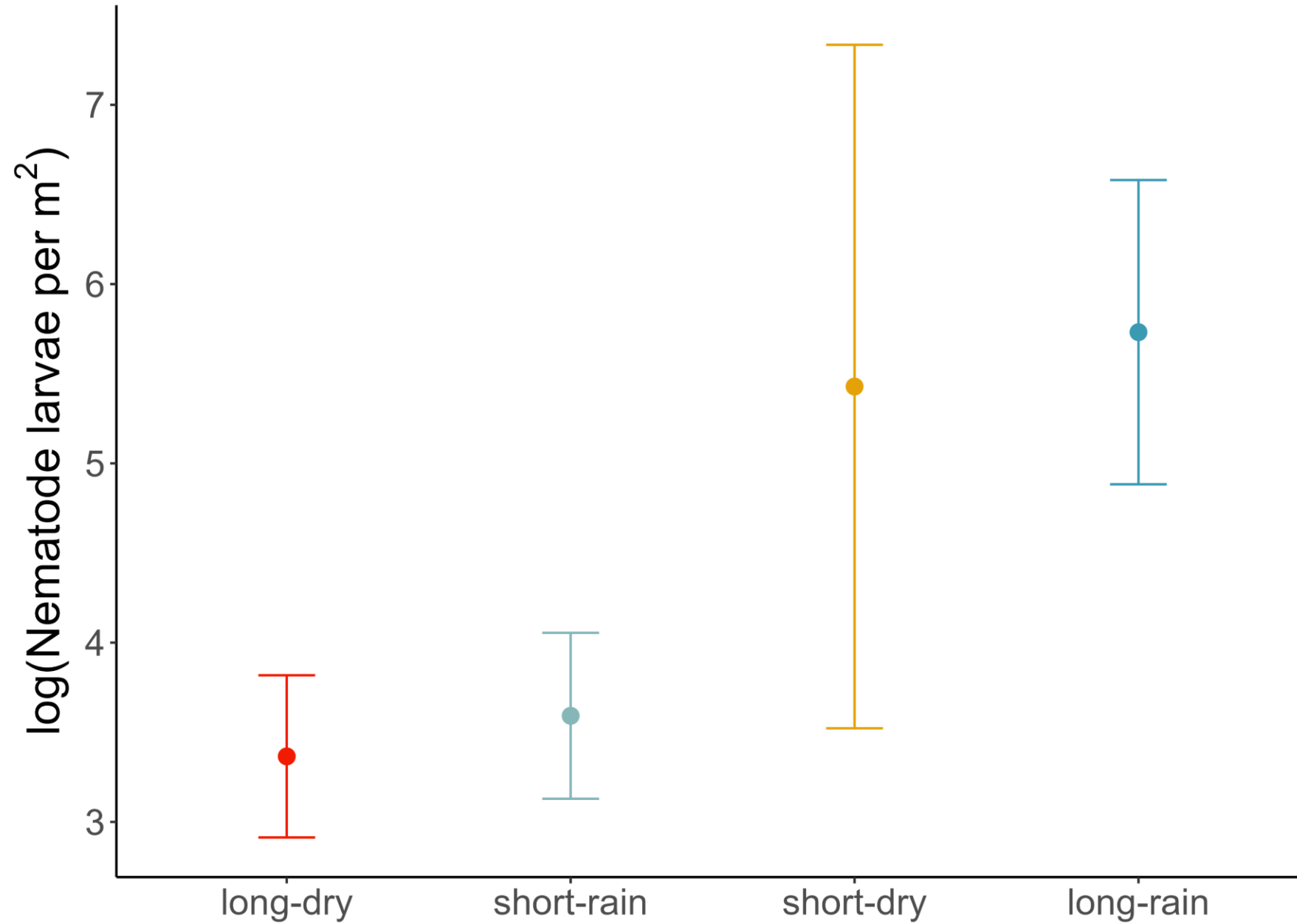


# Gastrointestinal nematodes





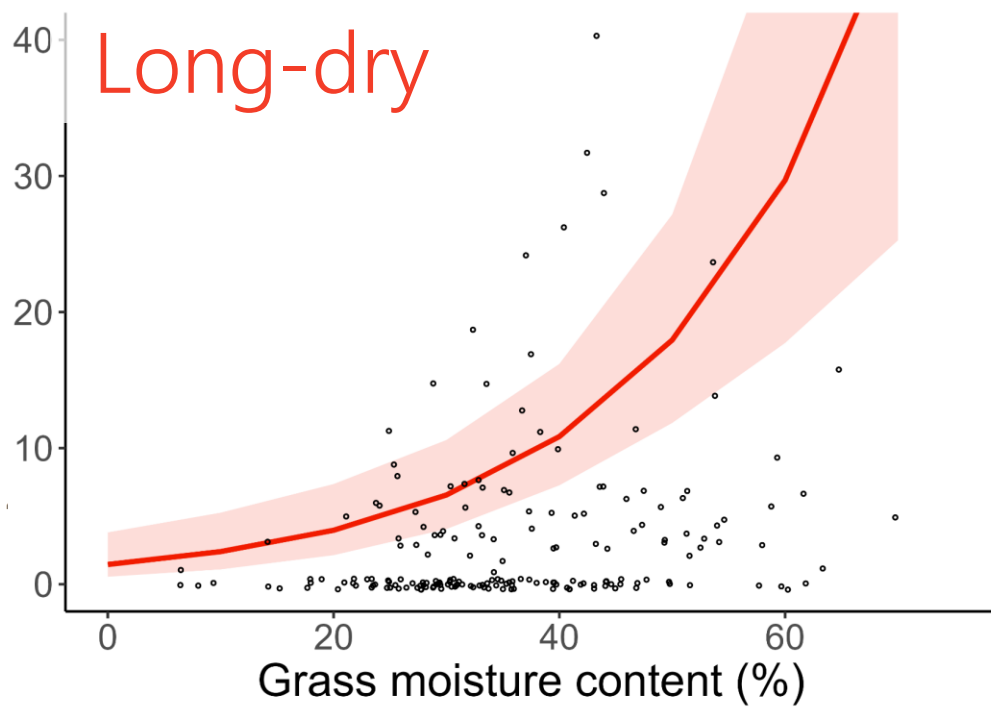
# Seasonal GIN larvae dynamics



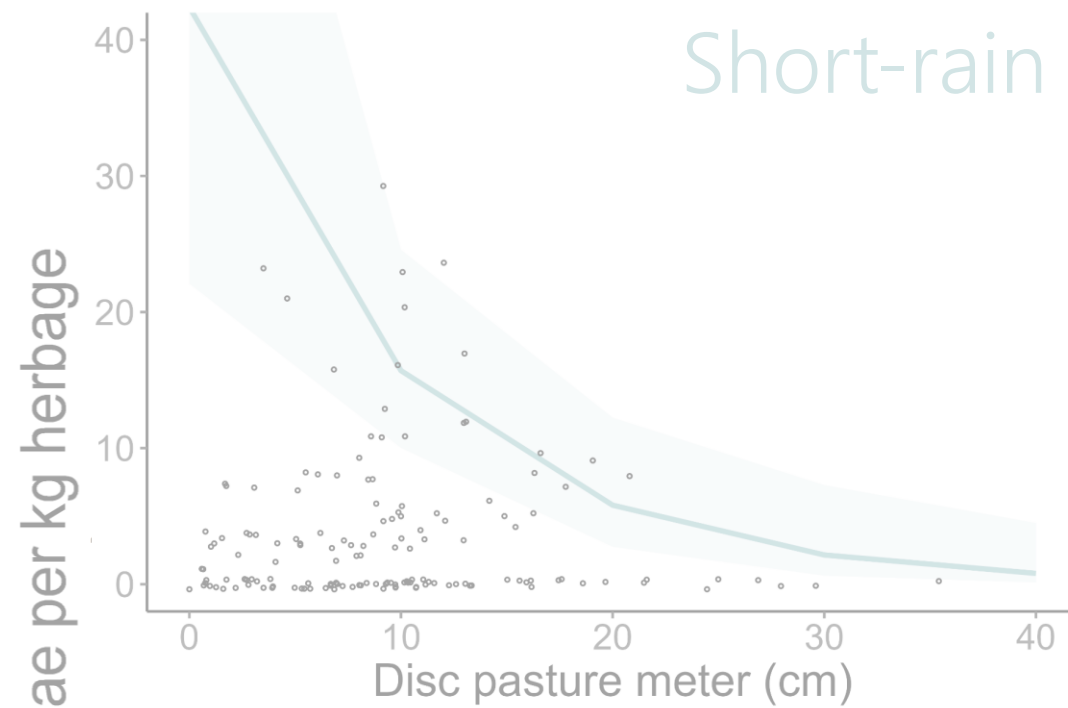
Gr. biomass  
Gr. Moisture  
Res. Dung  
WB dung

Nematode larvae per kg herbage

Long-dry

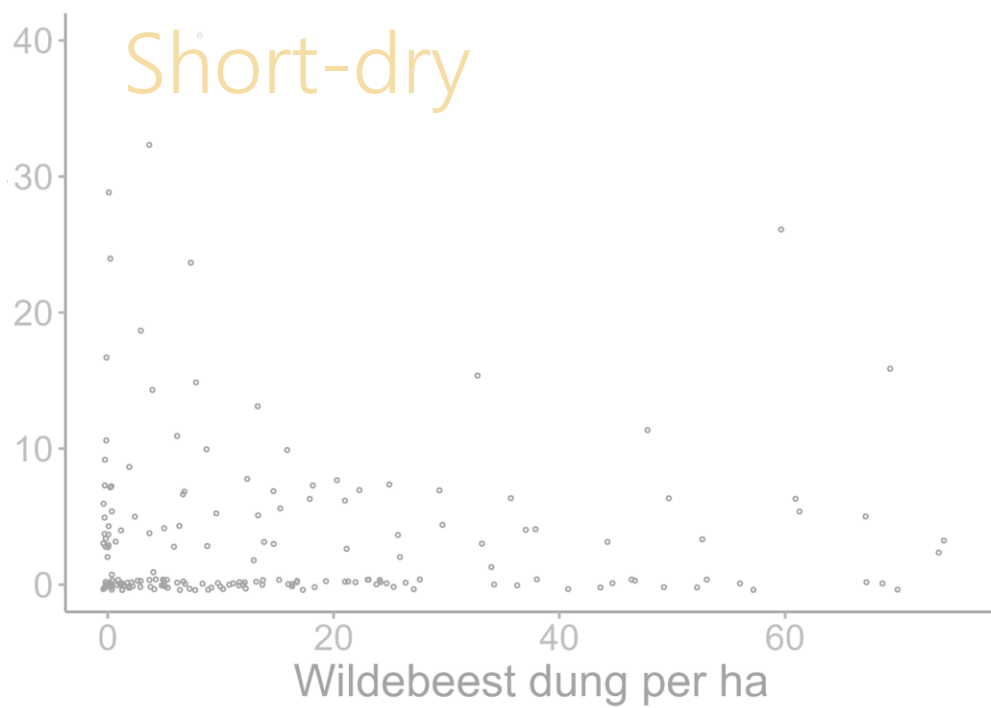


Short-rain

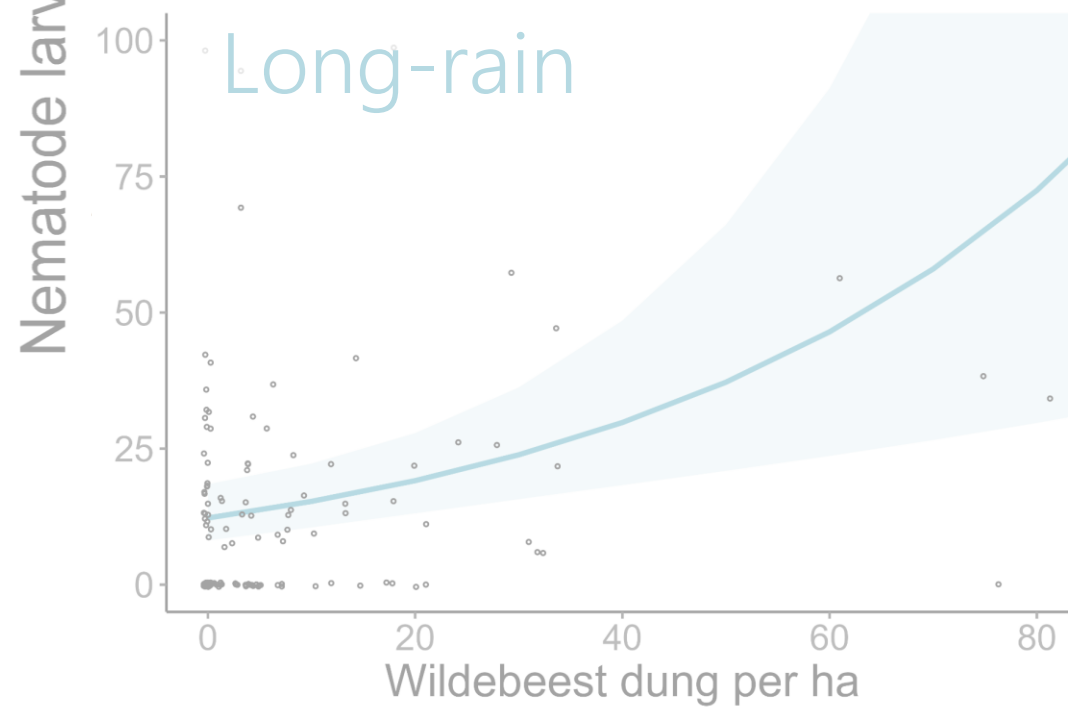


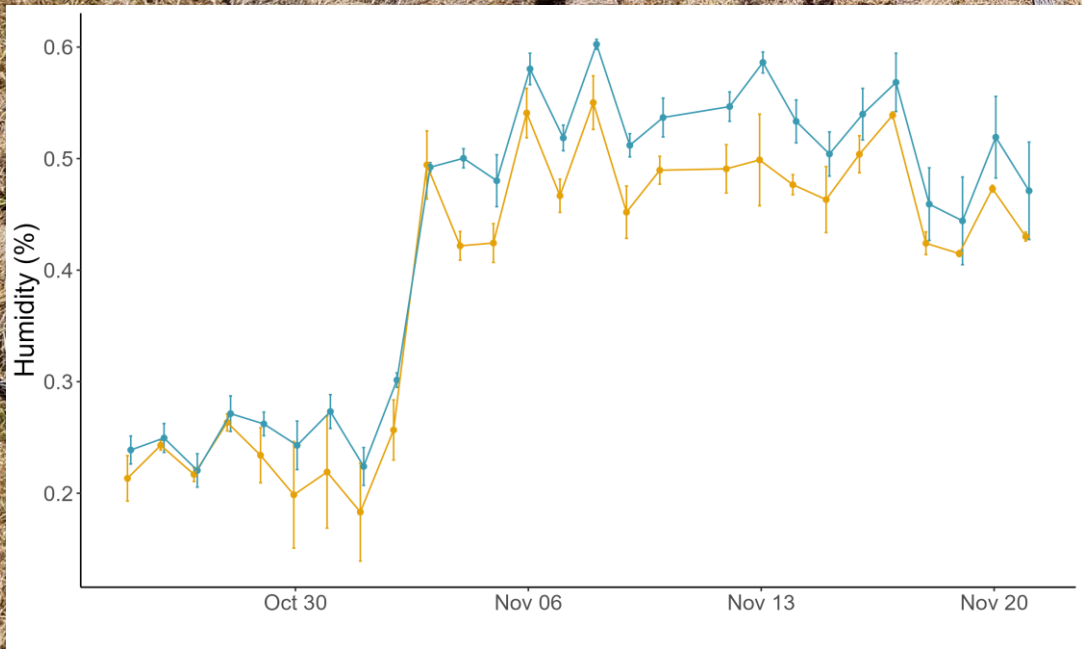
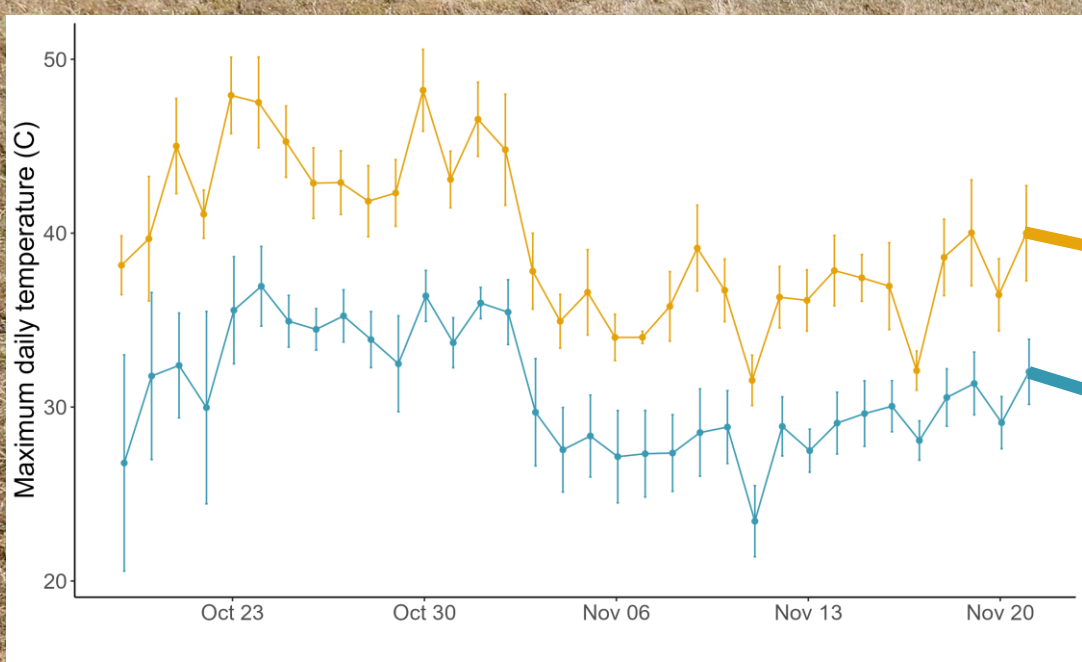
Gr. biomass  
Gr. Moisture\*  
Res. Dung  
WB dung

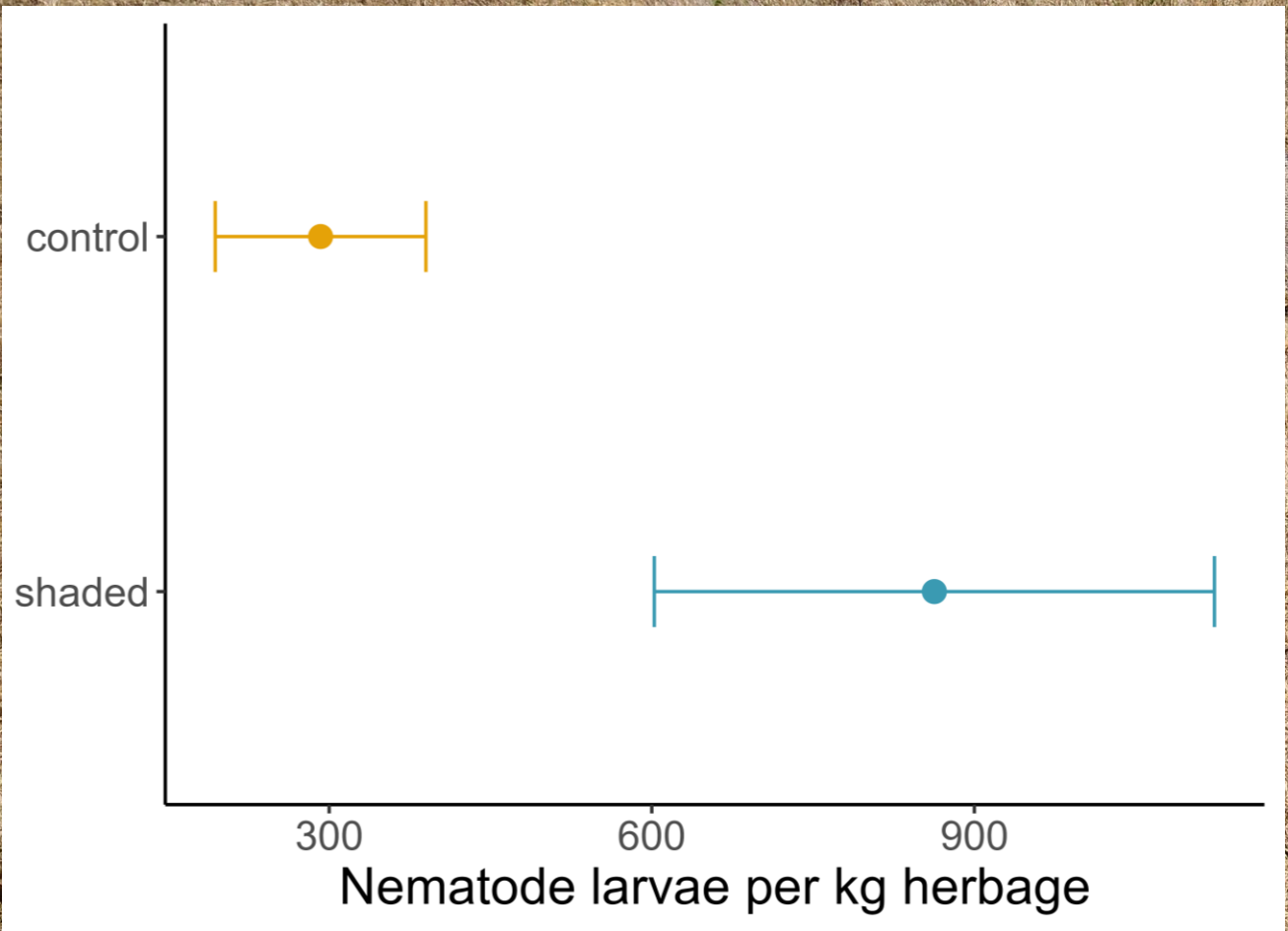
Short-dry

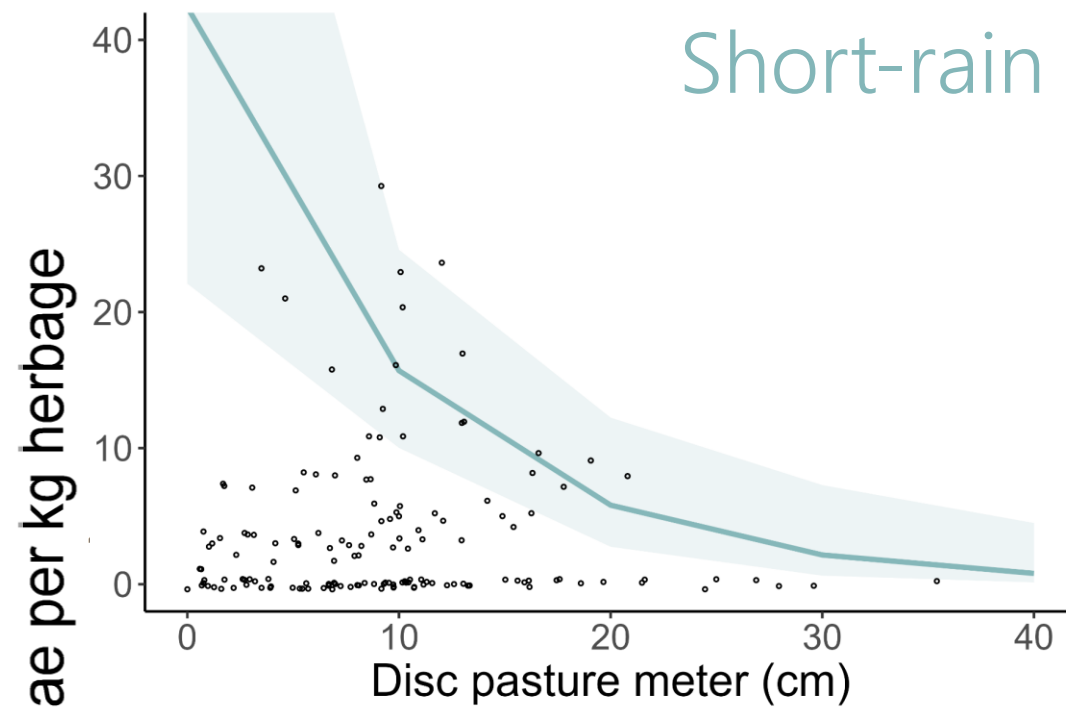
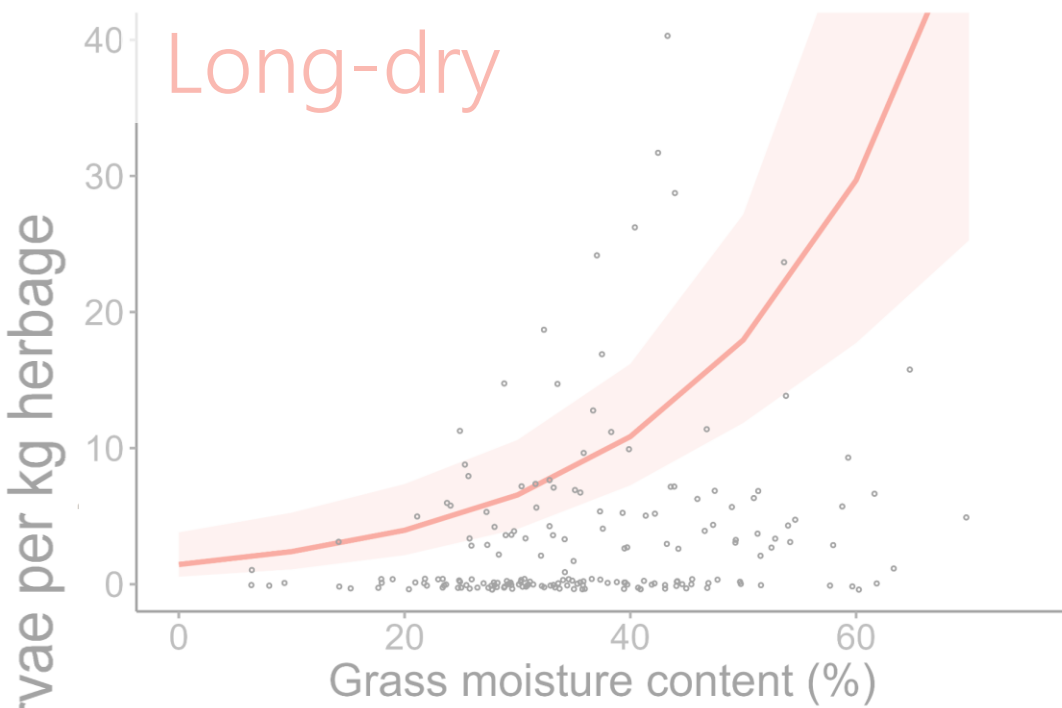


Long-rain

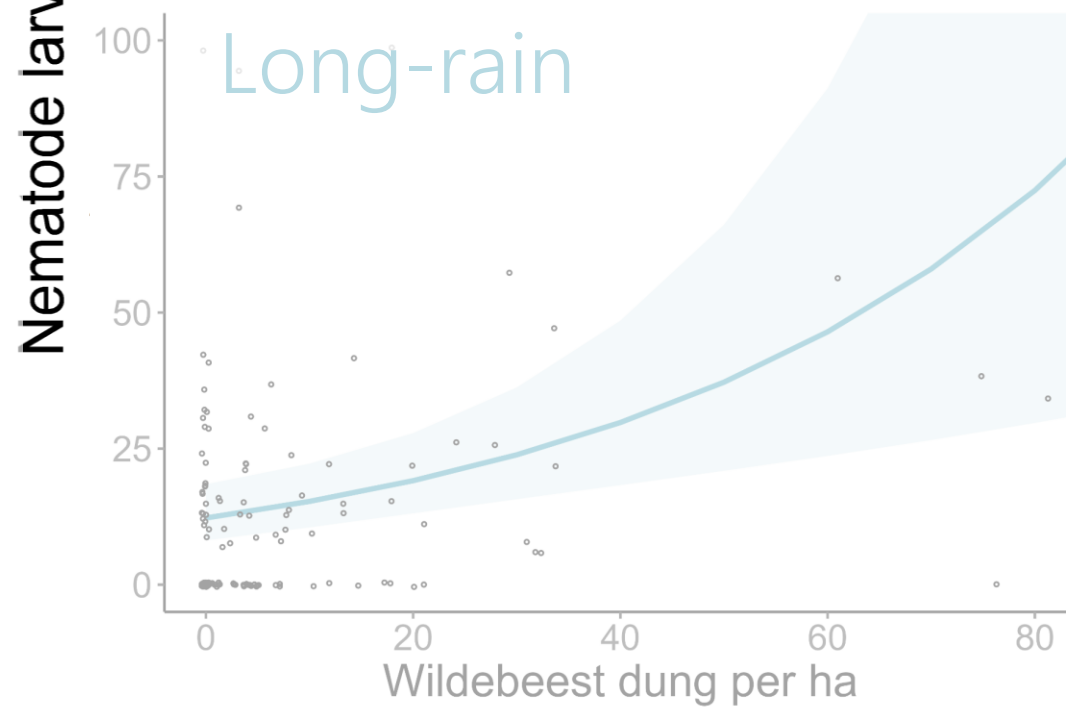
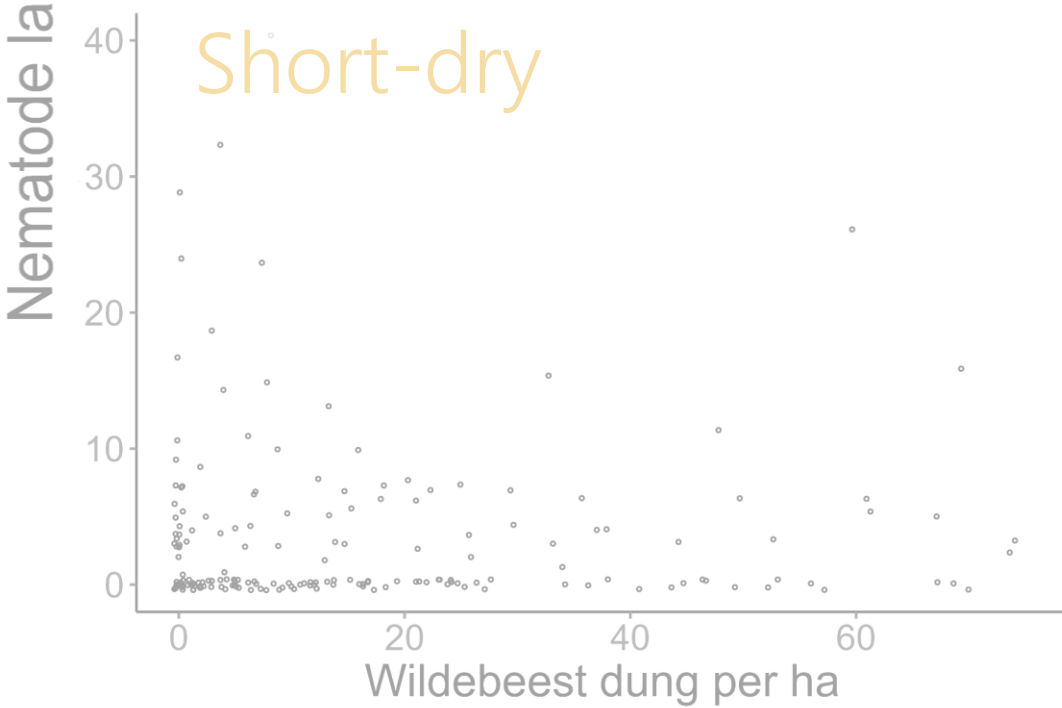


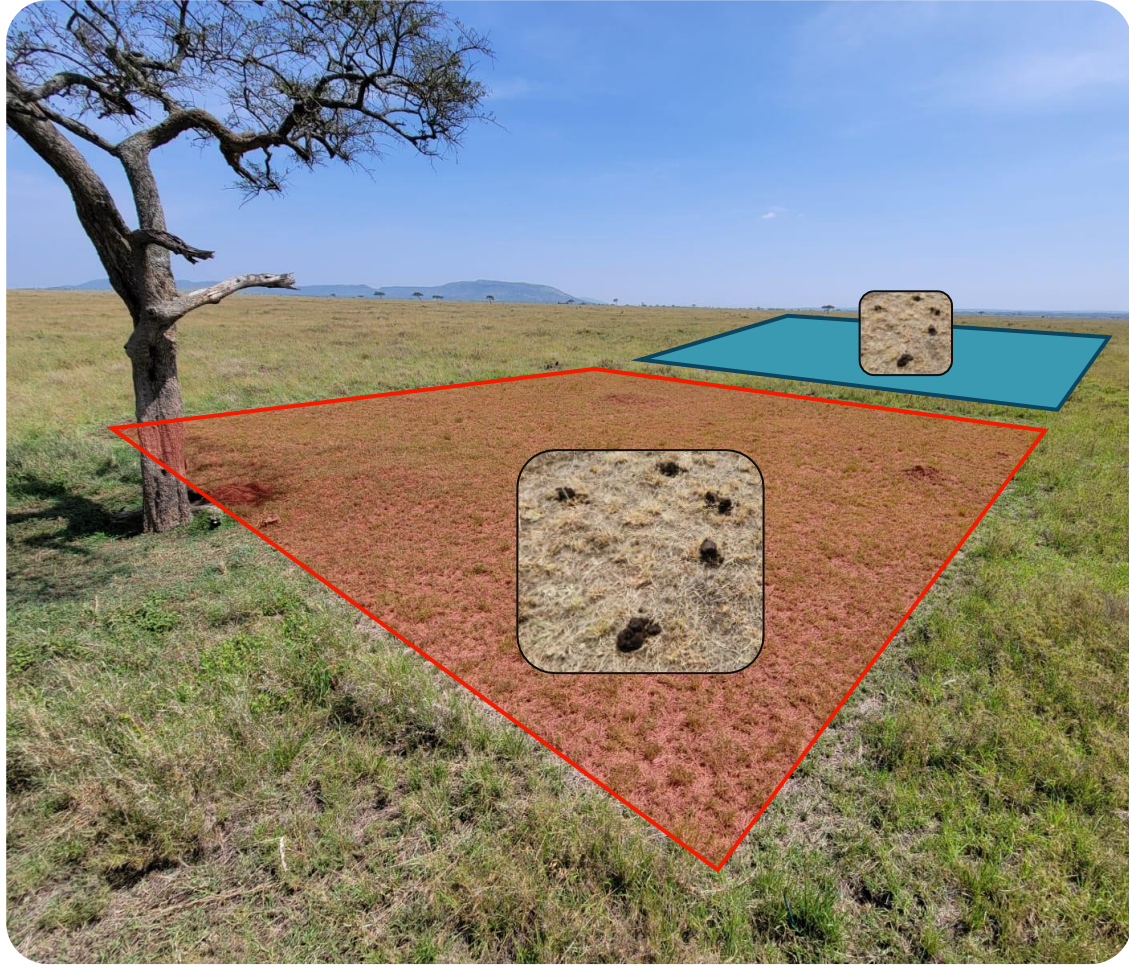






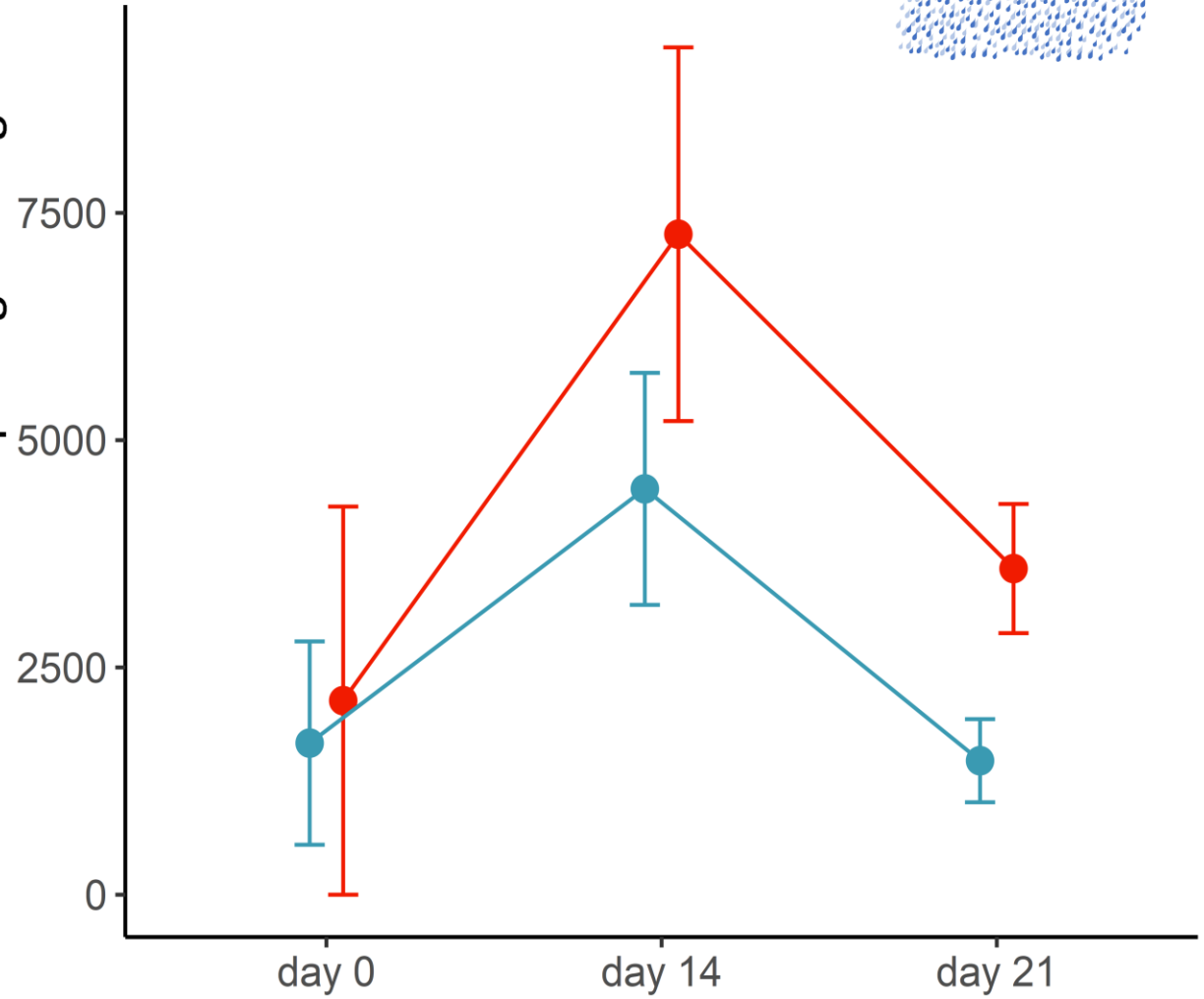
Gr. Biomass\*  
Gr. Moisture  
Res. Dung\*  
WB dung



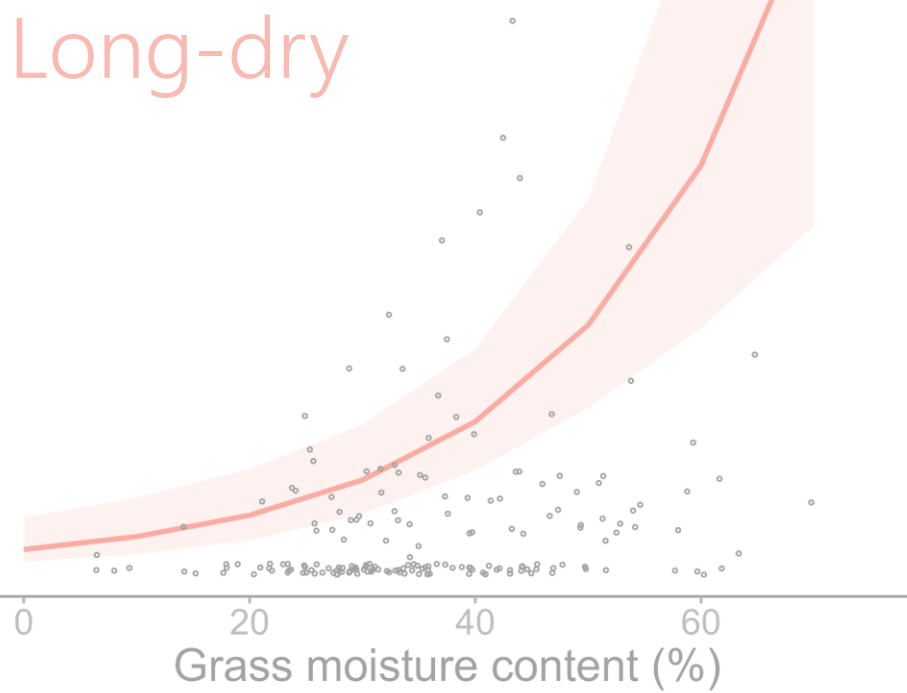


Nematode larvae per kg herbage

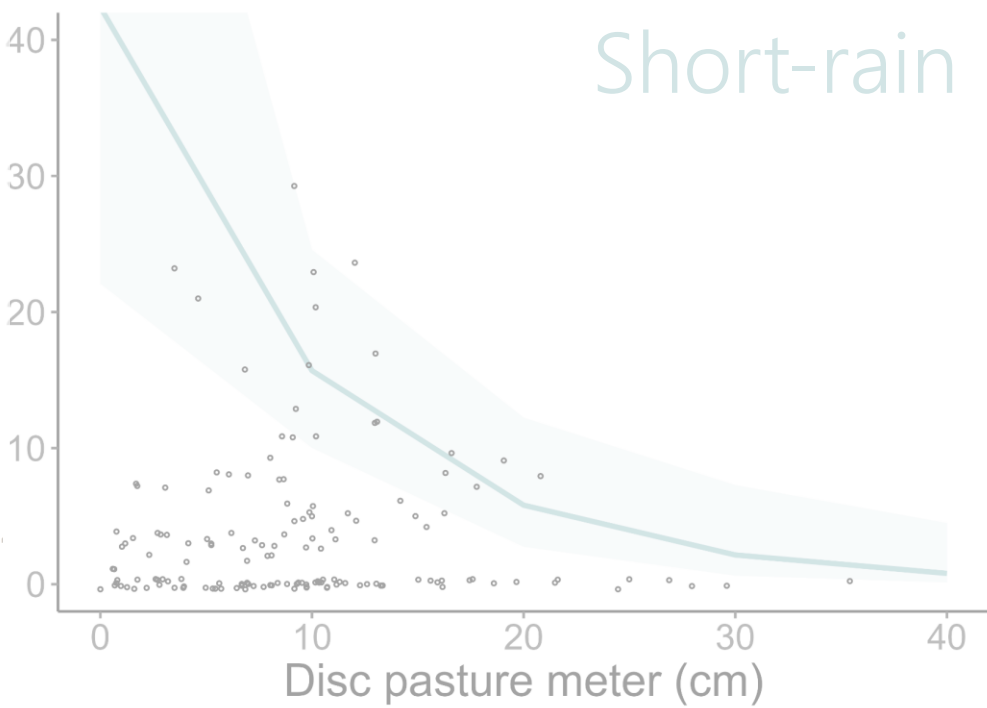
● control ● clipped



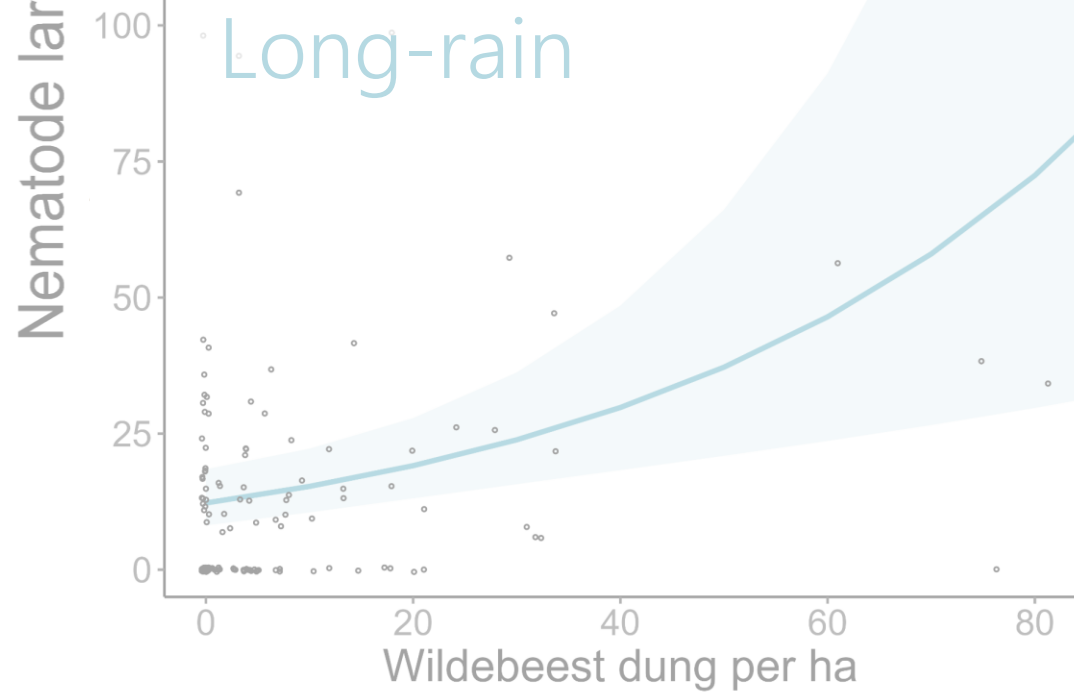
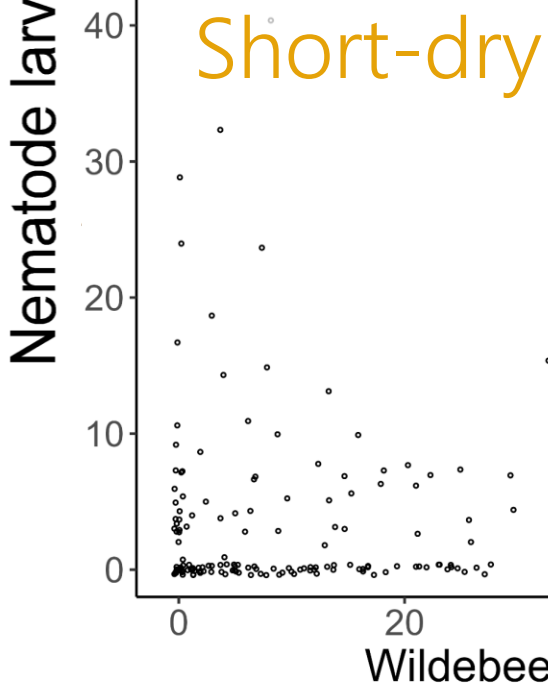
Nematode larvae per kg herbage



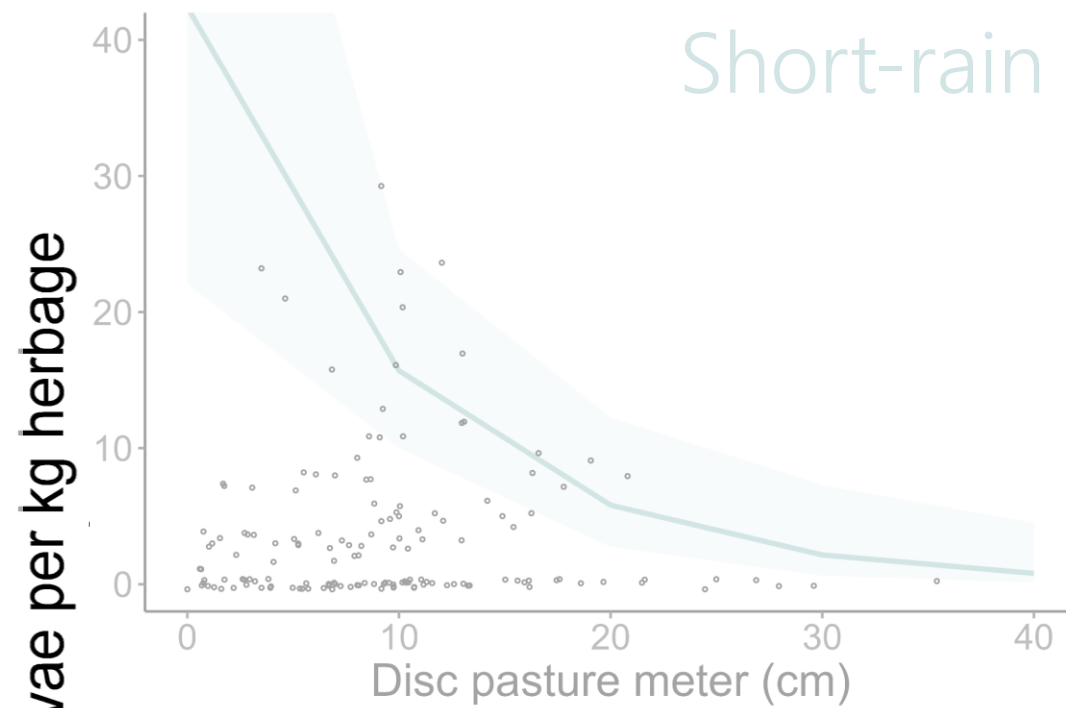
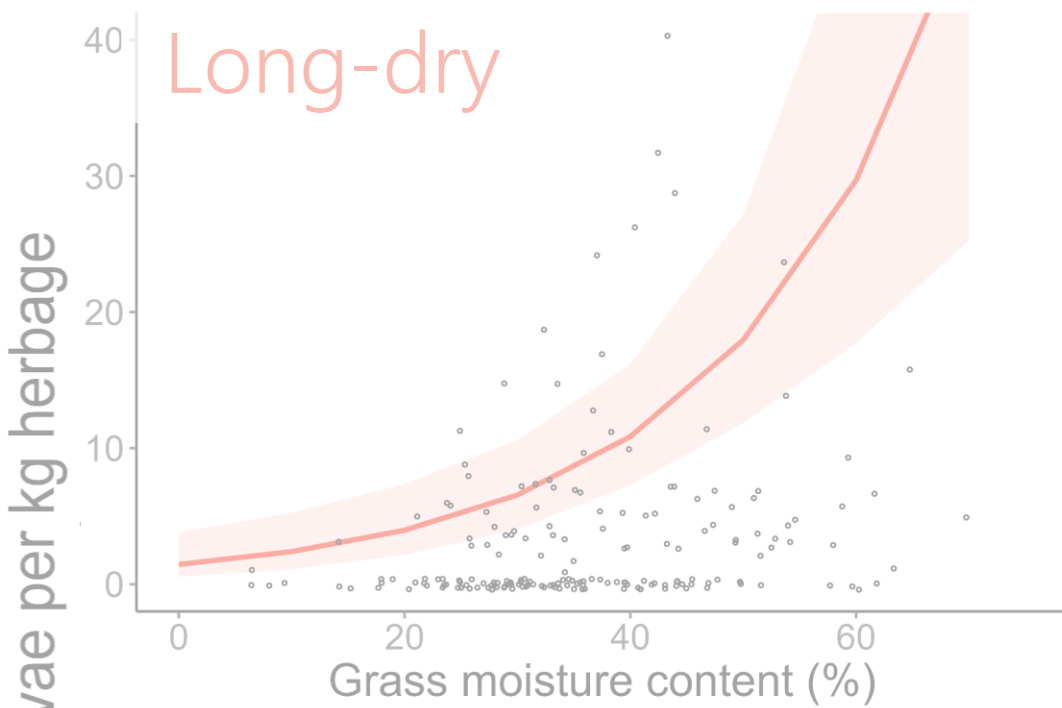
Nematode larvae per kg herbage



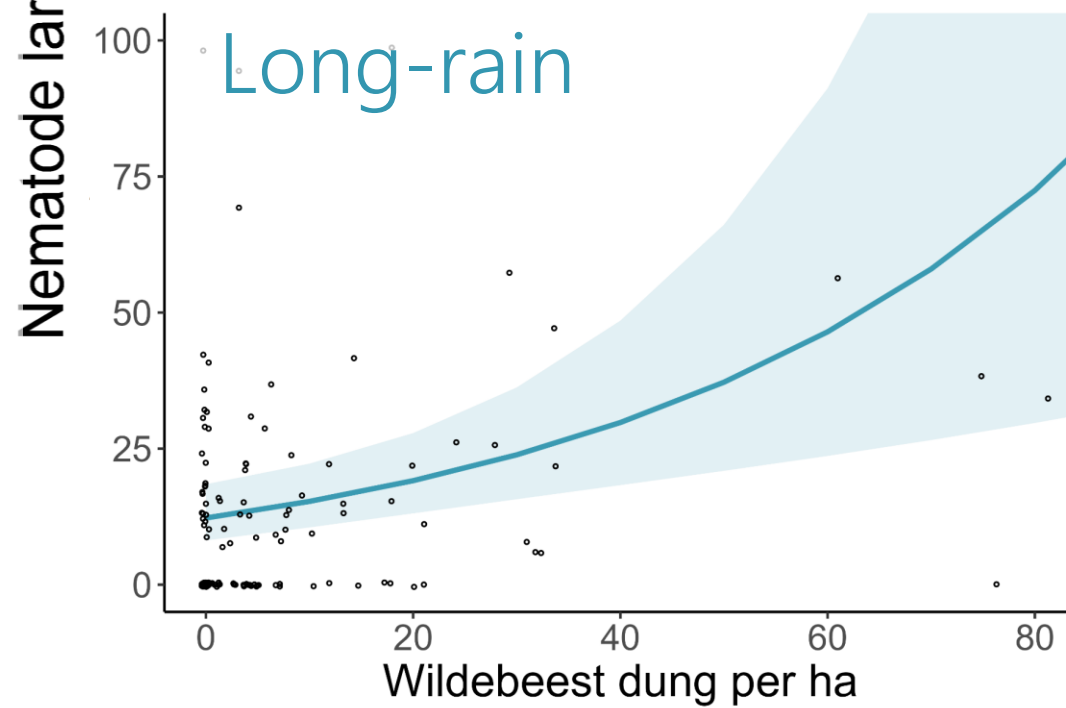
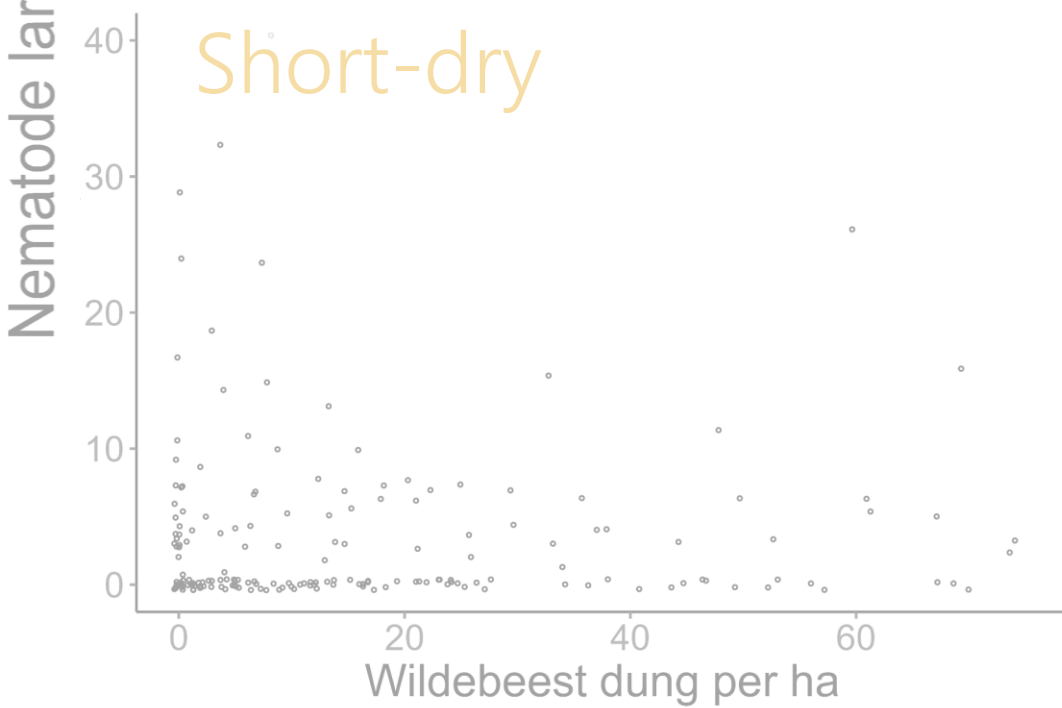
Gr. Biomass +  
Gr. Moisture +  
Res. Dung +  
WB dung







Gr. Biomass +  
Gr. Moisture +  
Res. Dung +  
**WB dung\***



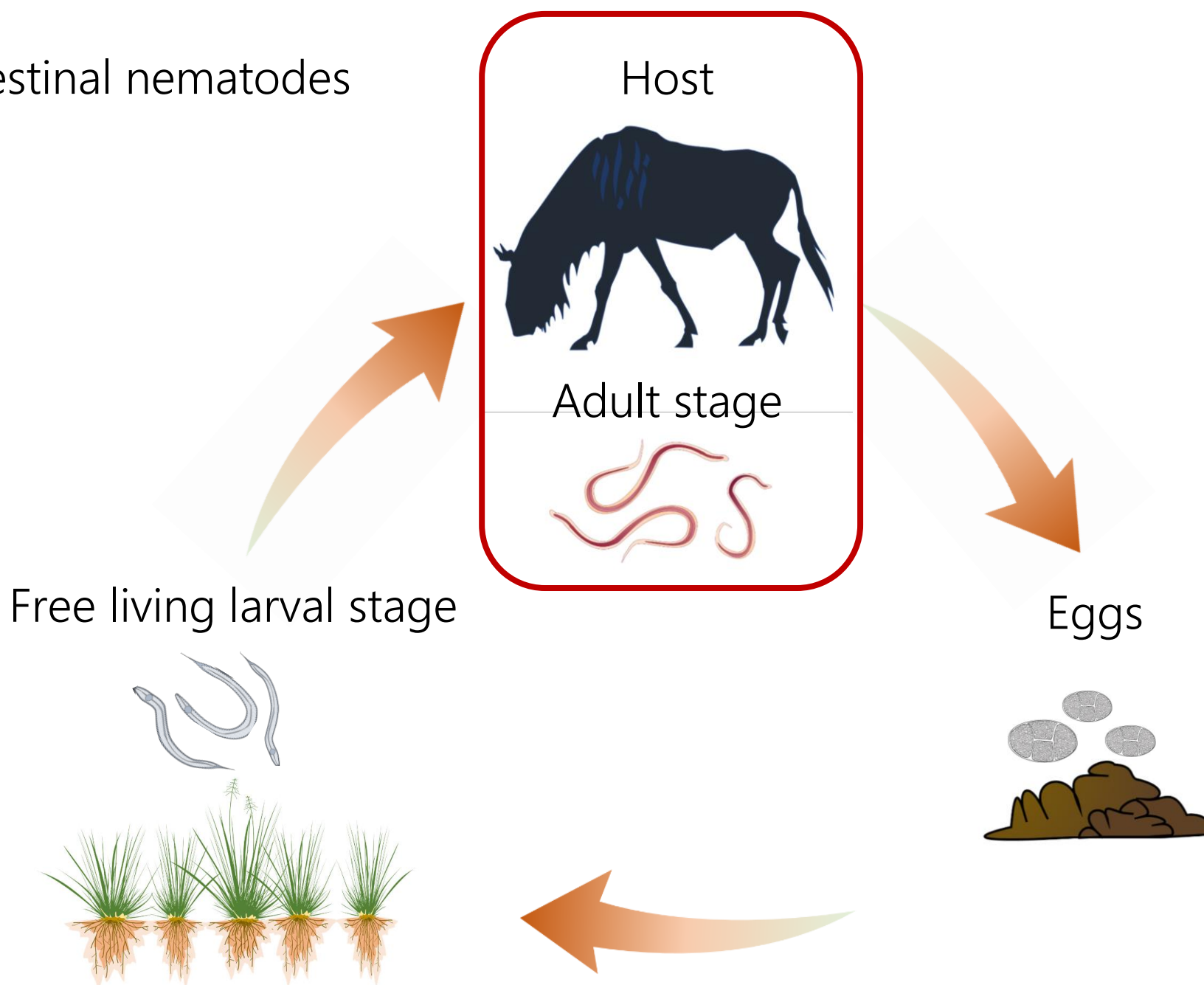
Do migrations interact with seasonal conditions to change infection risk across the landscape?

Yes, seasonal conditions limit GIN larvae survival and GIN larvae additions by migratory wildebeest are only relevant in the long rains.

What are the outcomes for GIN infections in non-migratory hosts?



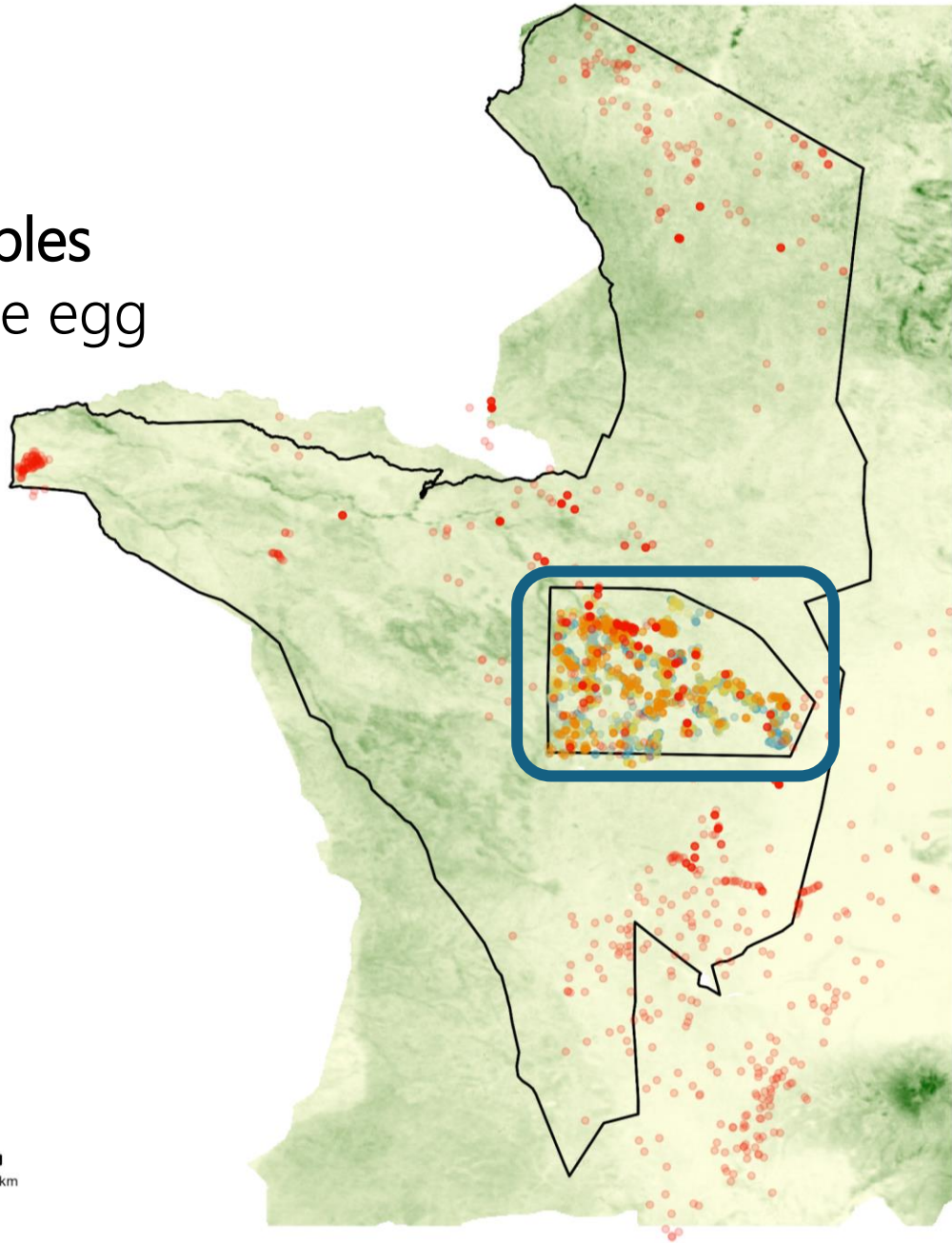
# Gastrointestinal nematodes





## Dung samples

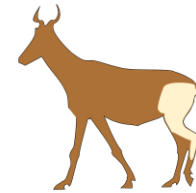
- Strongyle egg counts



Grant's gazelle (n = 1082)



Topi (n = 1076)



Hartebeest (n = 1084)

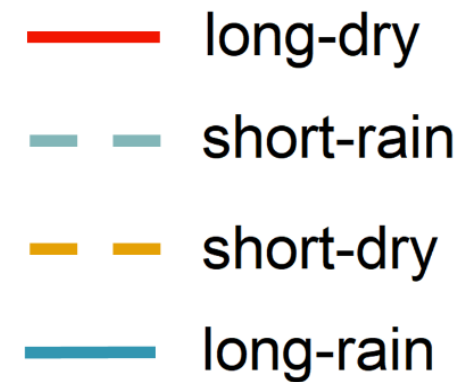
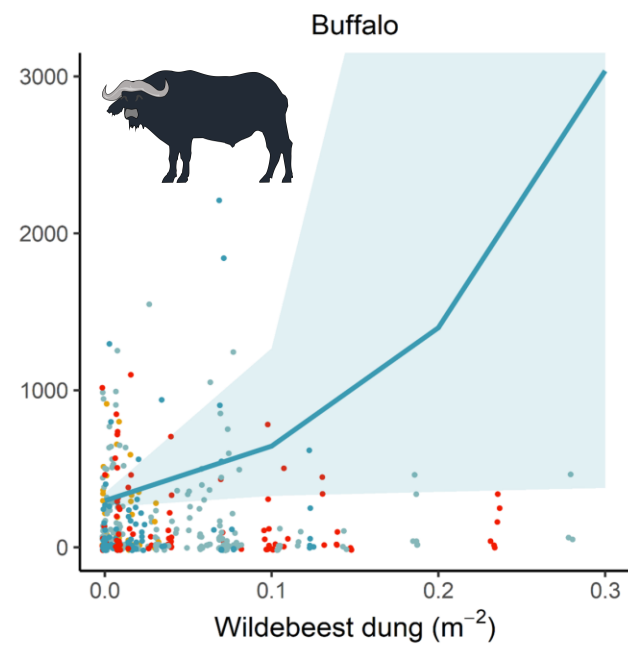
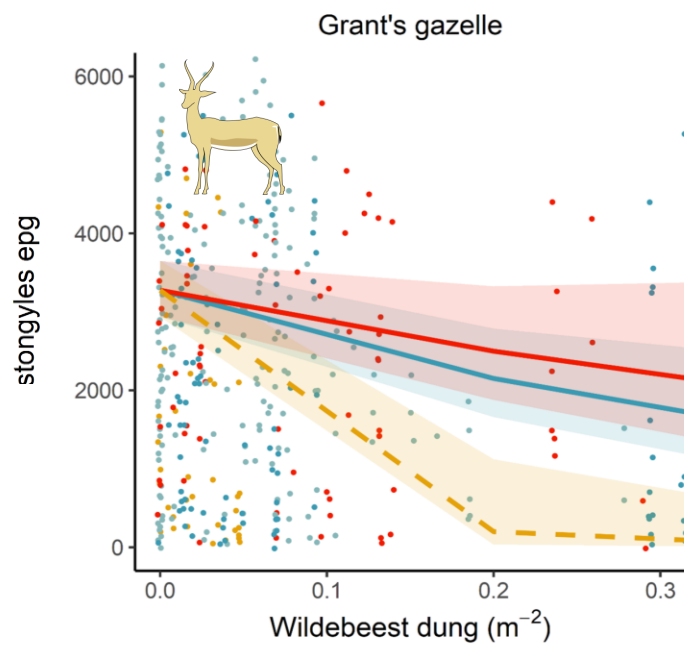
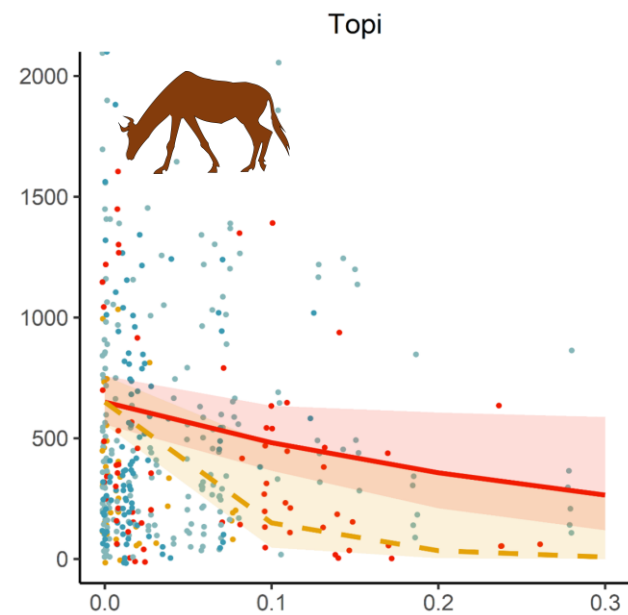
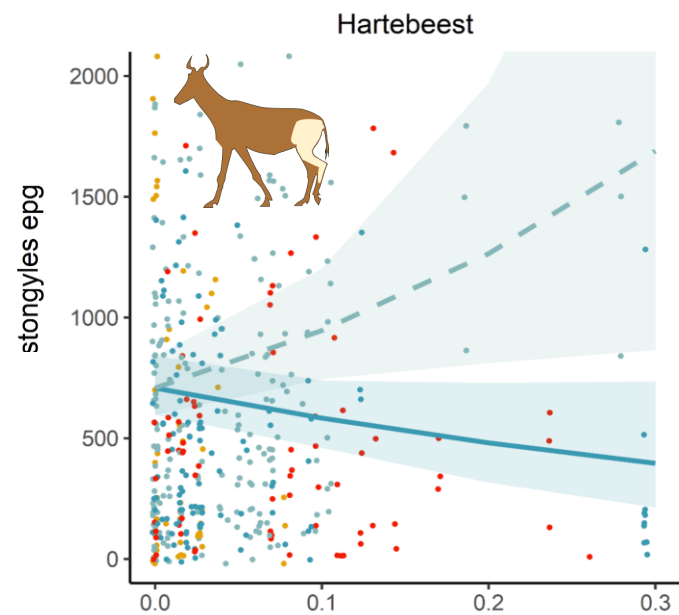


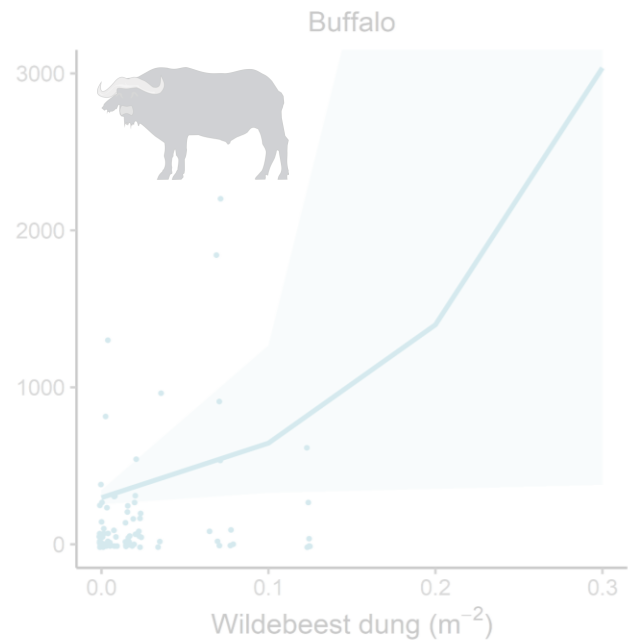
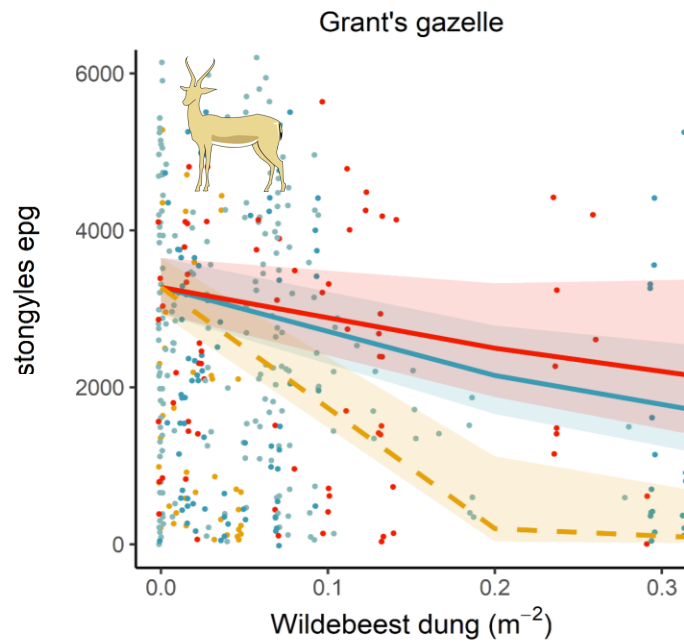
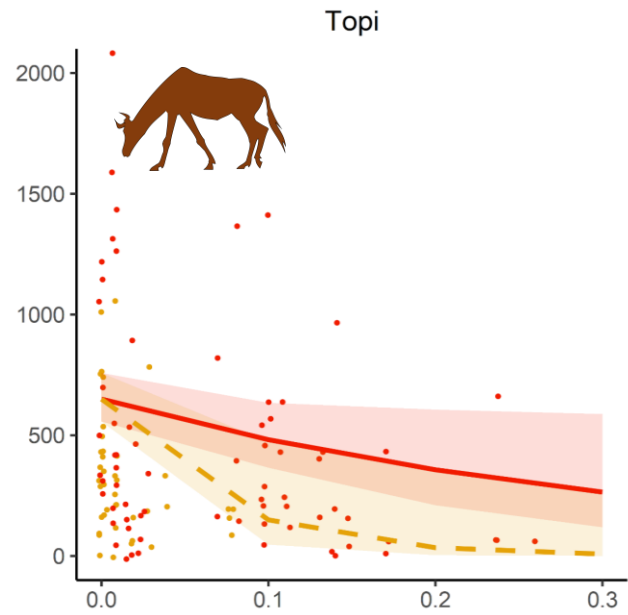
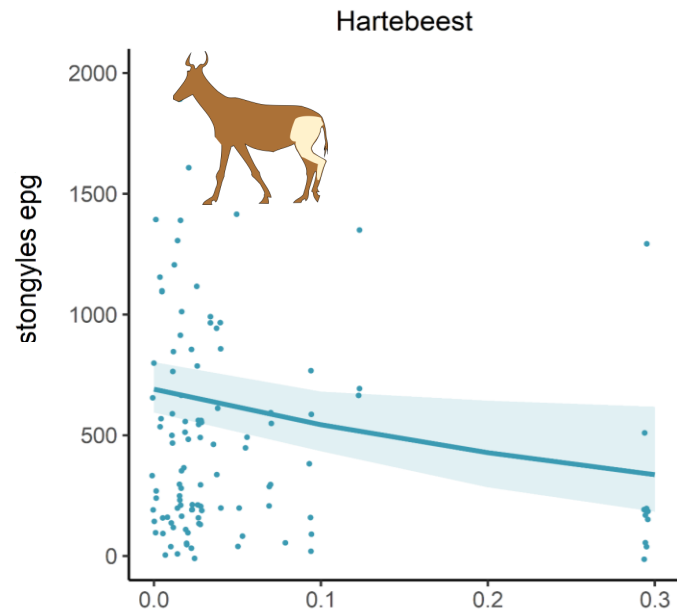
Buffalo (n = 1103)



Wildebeest (n = 1277)







- long-dry
- short-rain
- short-dry
- long-rain



Control



Day 0



Treatment



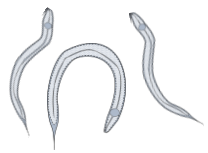
Day 14



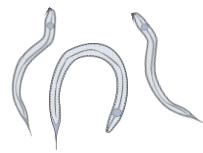
Clip grass  
to 5cm

=

Wildebeest  
consumption

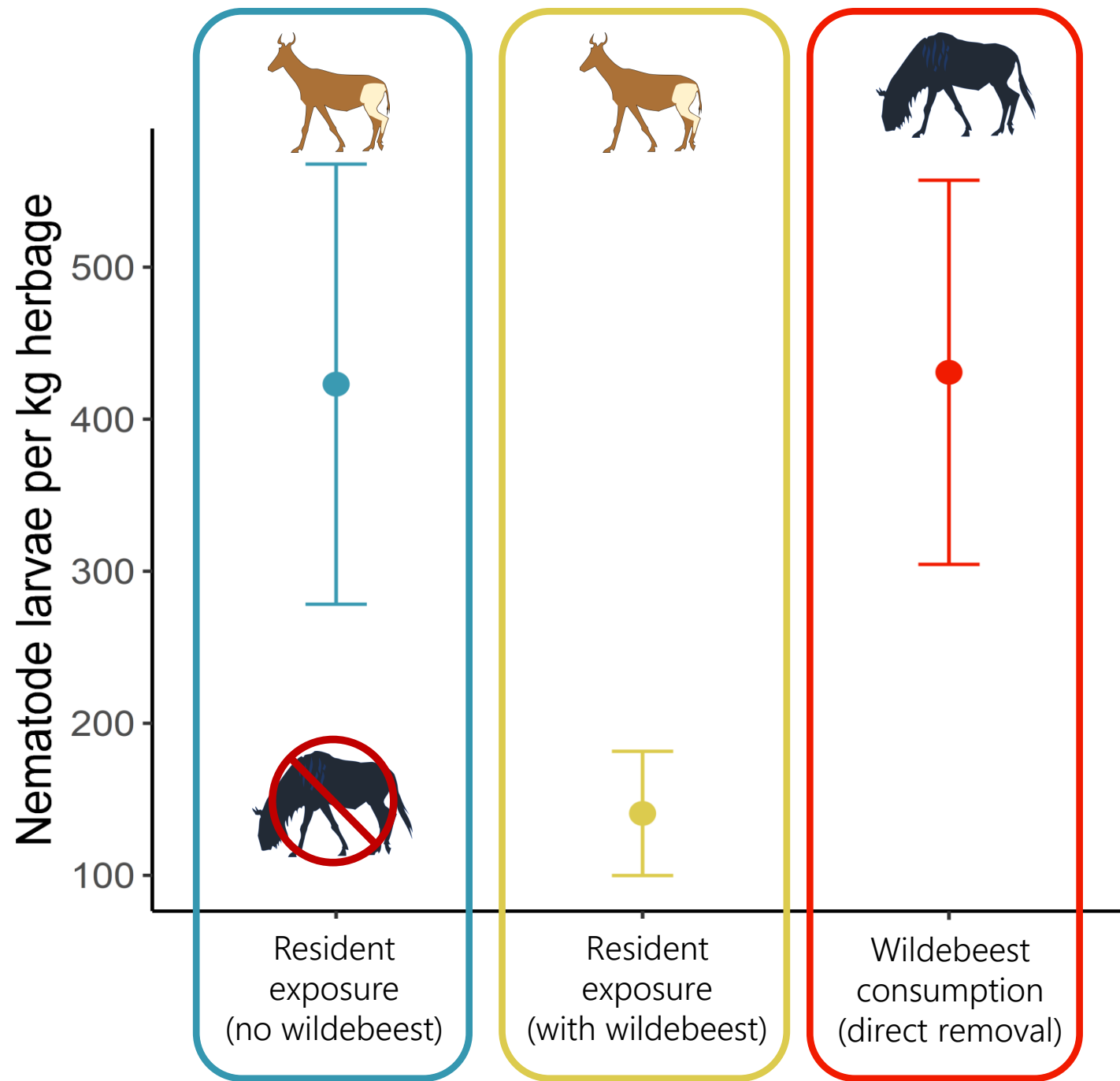


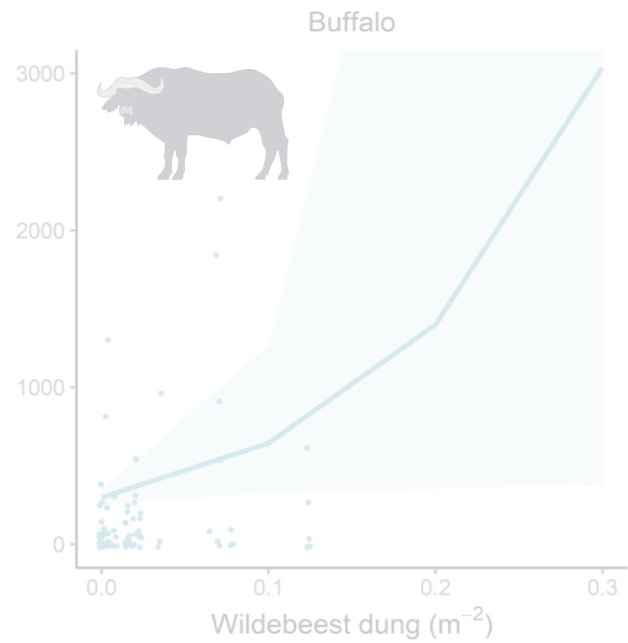
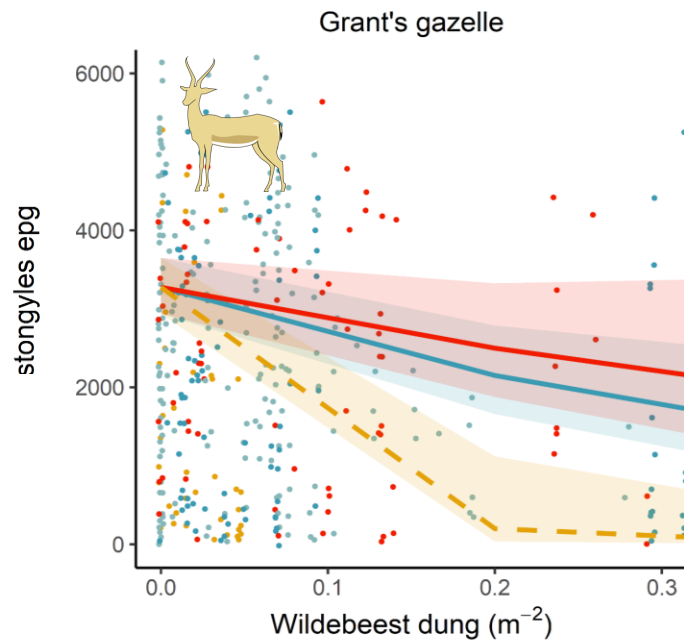
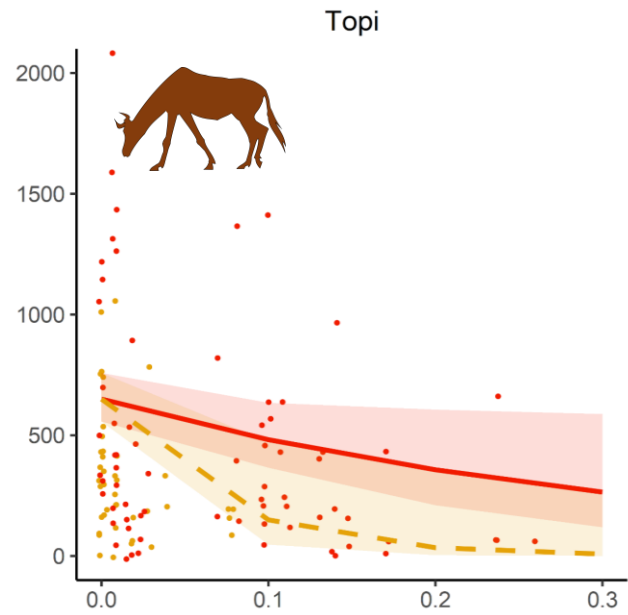
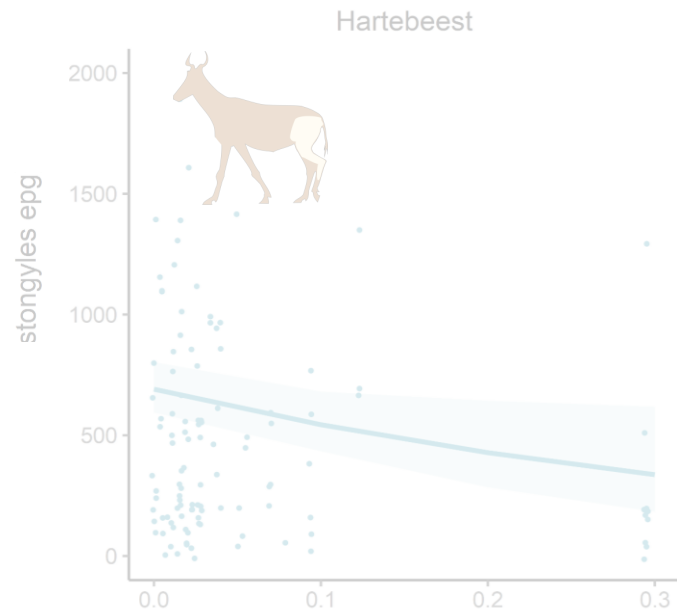
Resident  
exposure



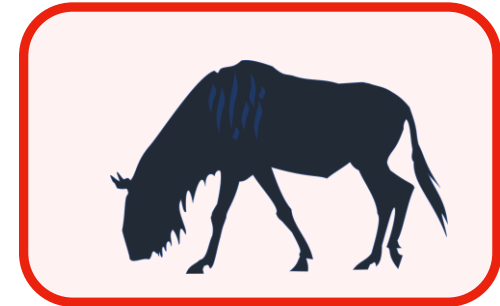
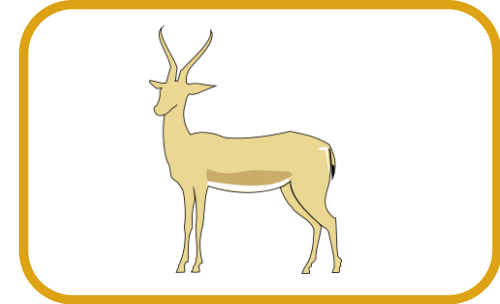
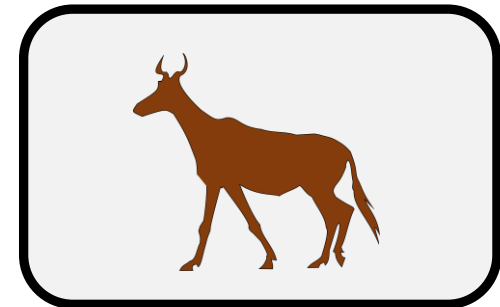
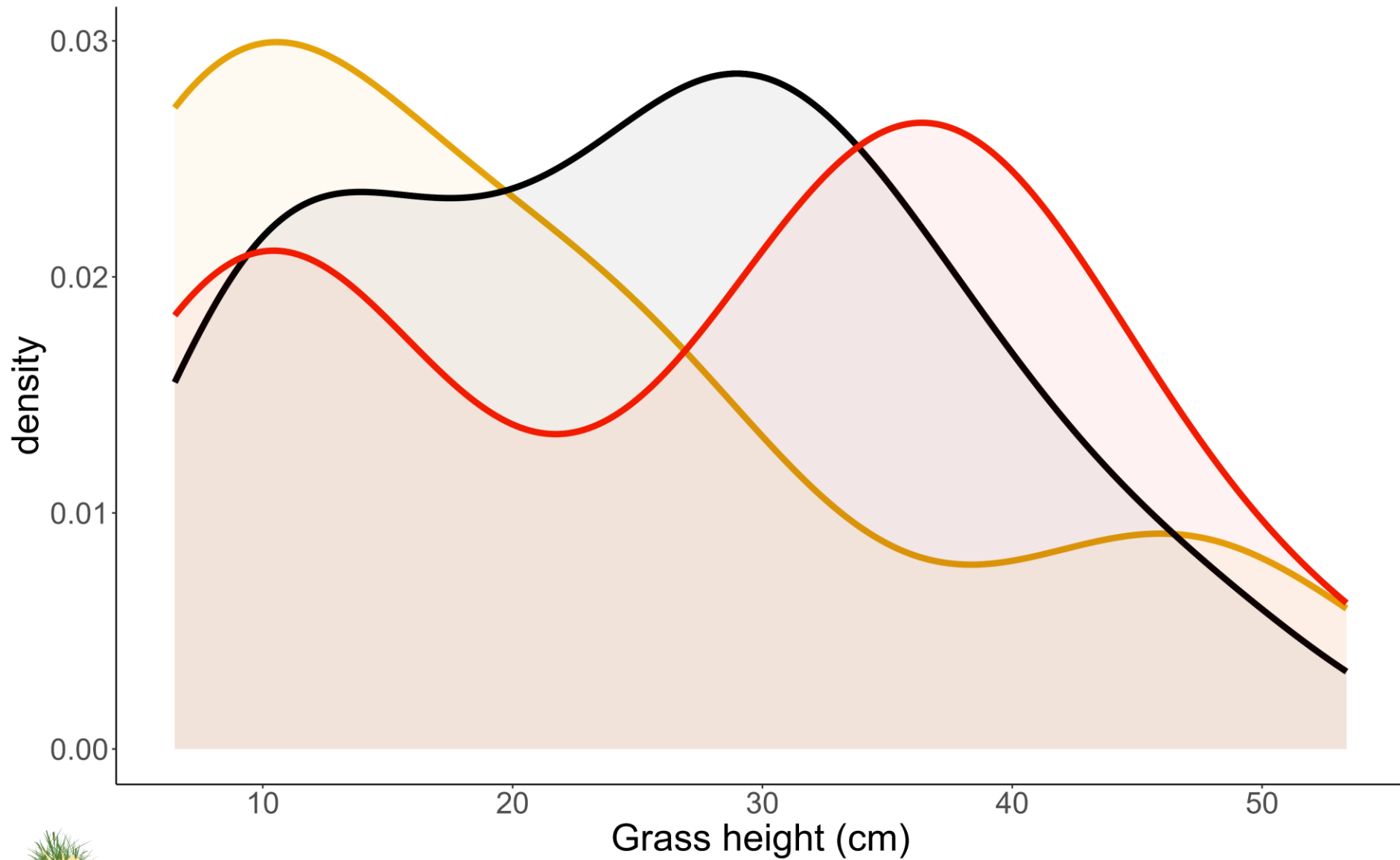
Resident  
exposure

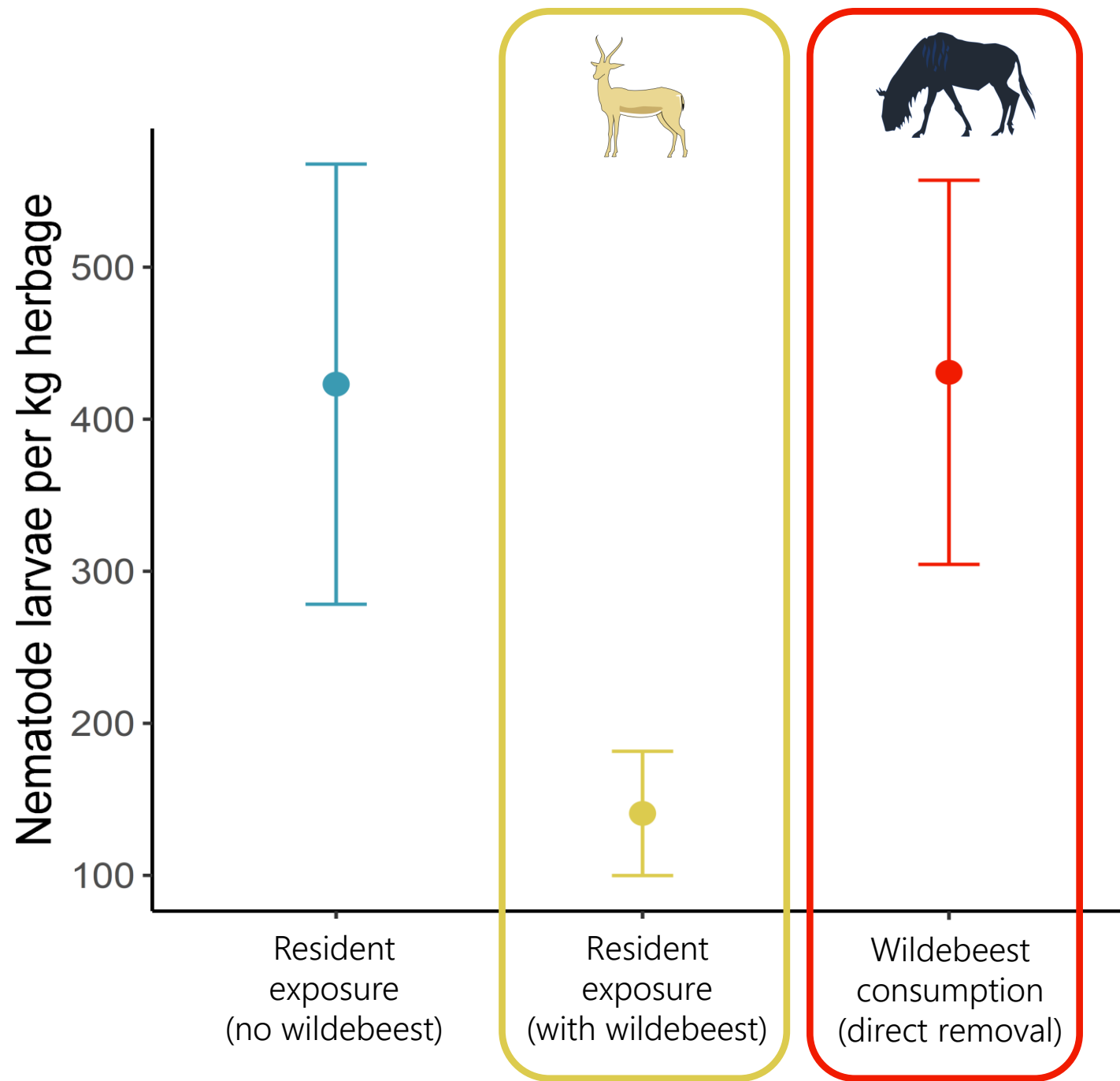


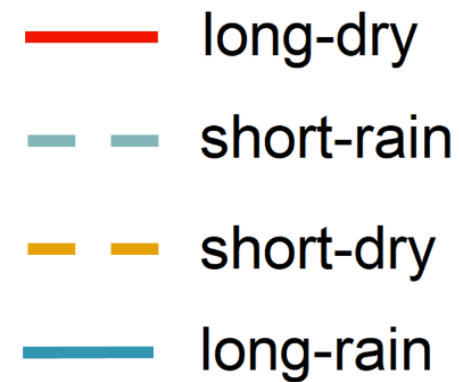
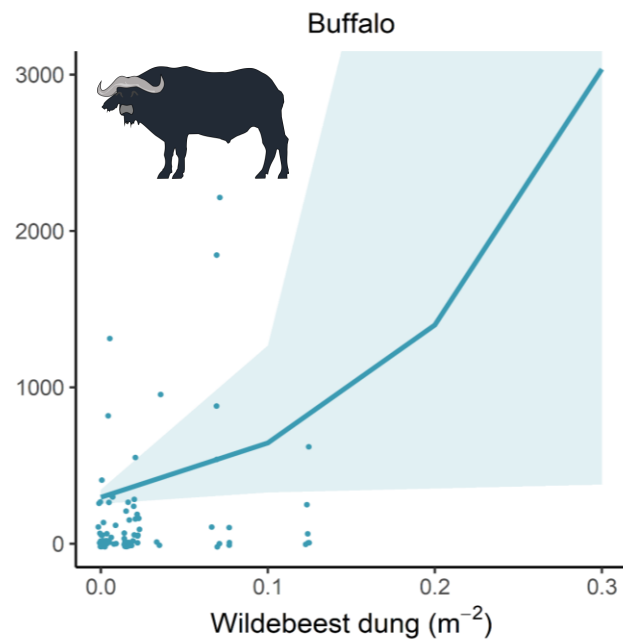
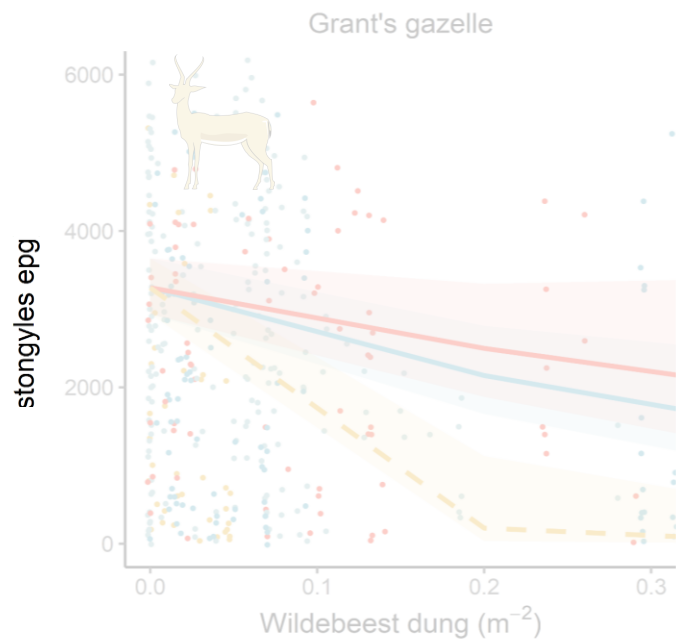
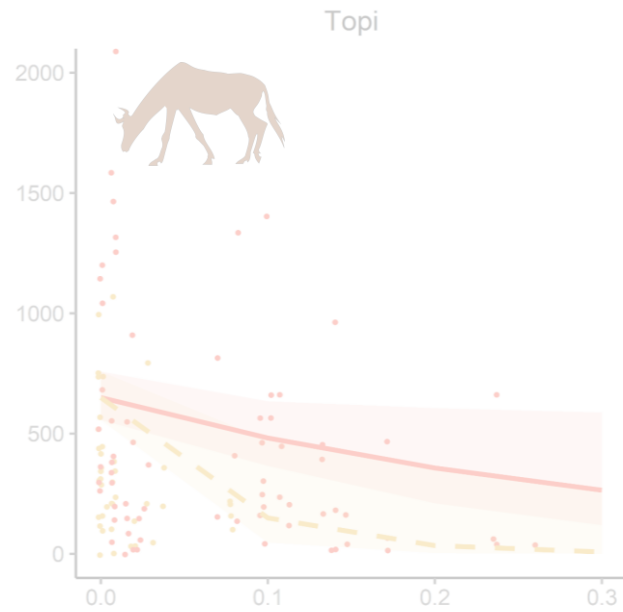
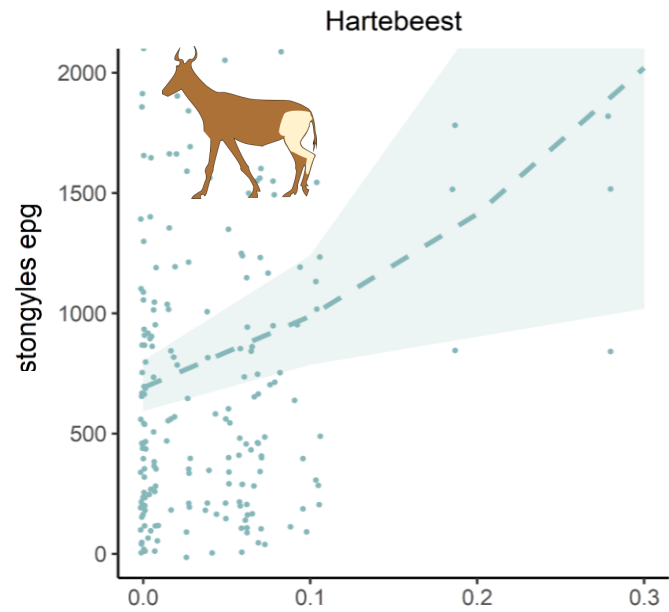


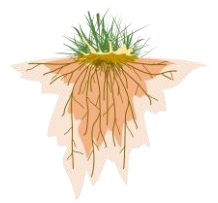
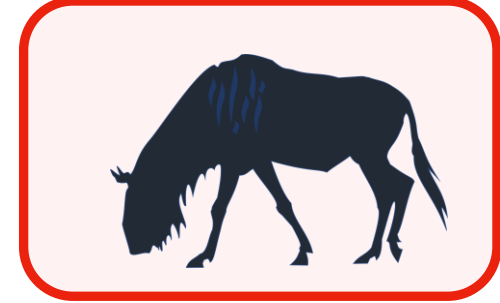
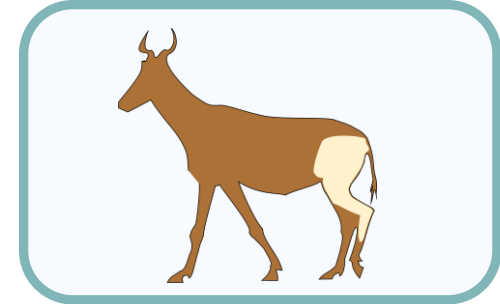
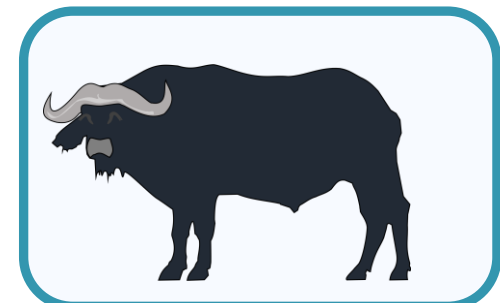
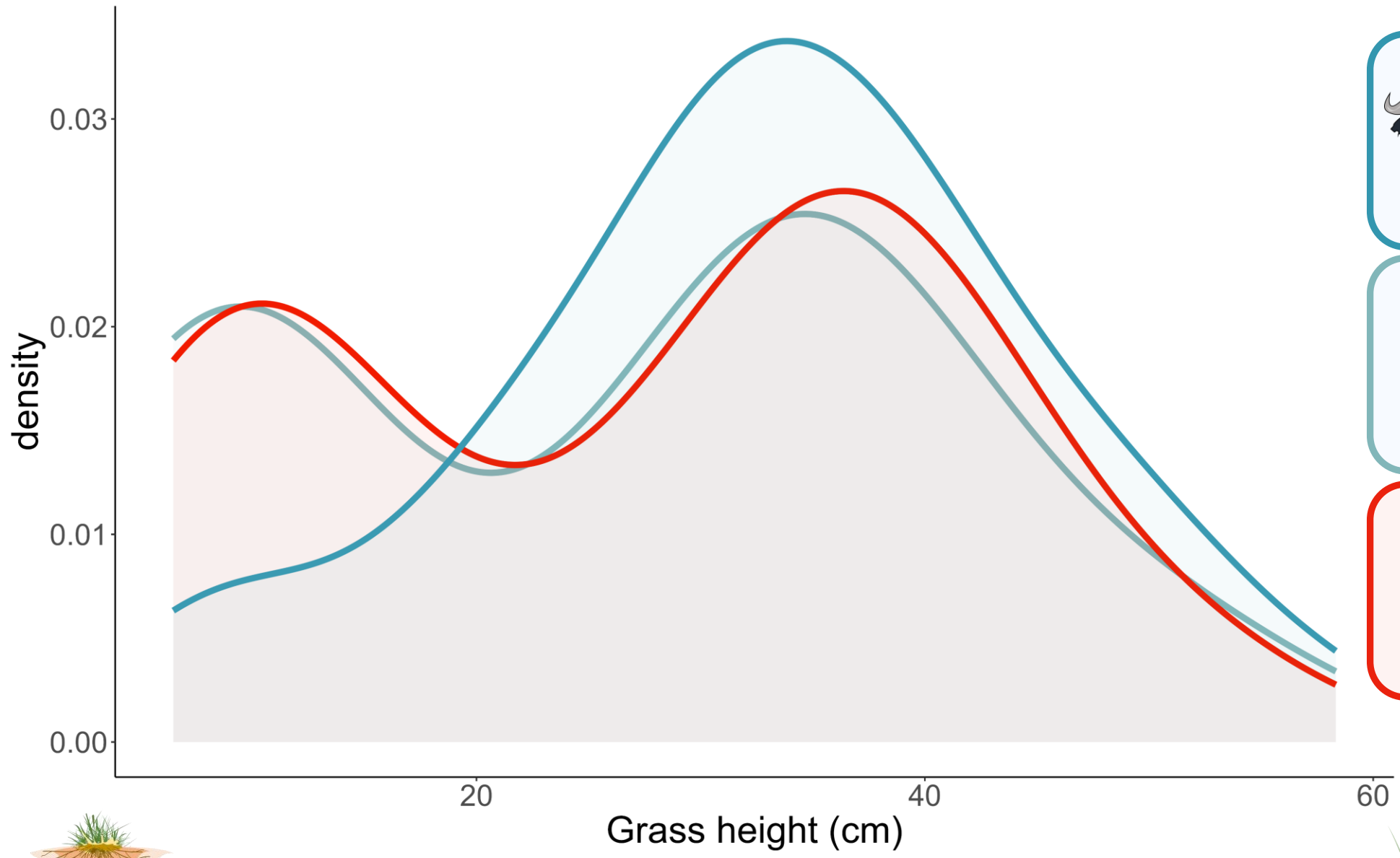


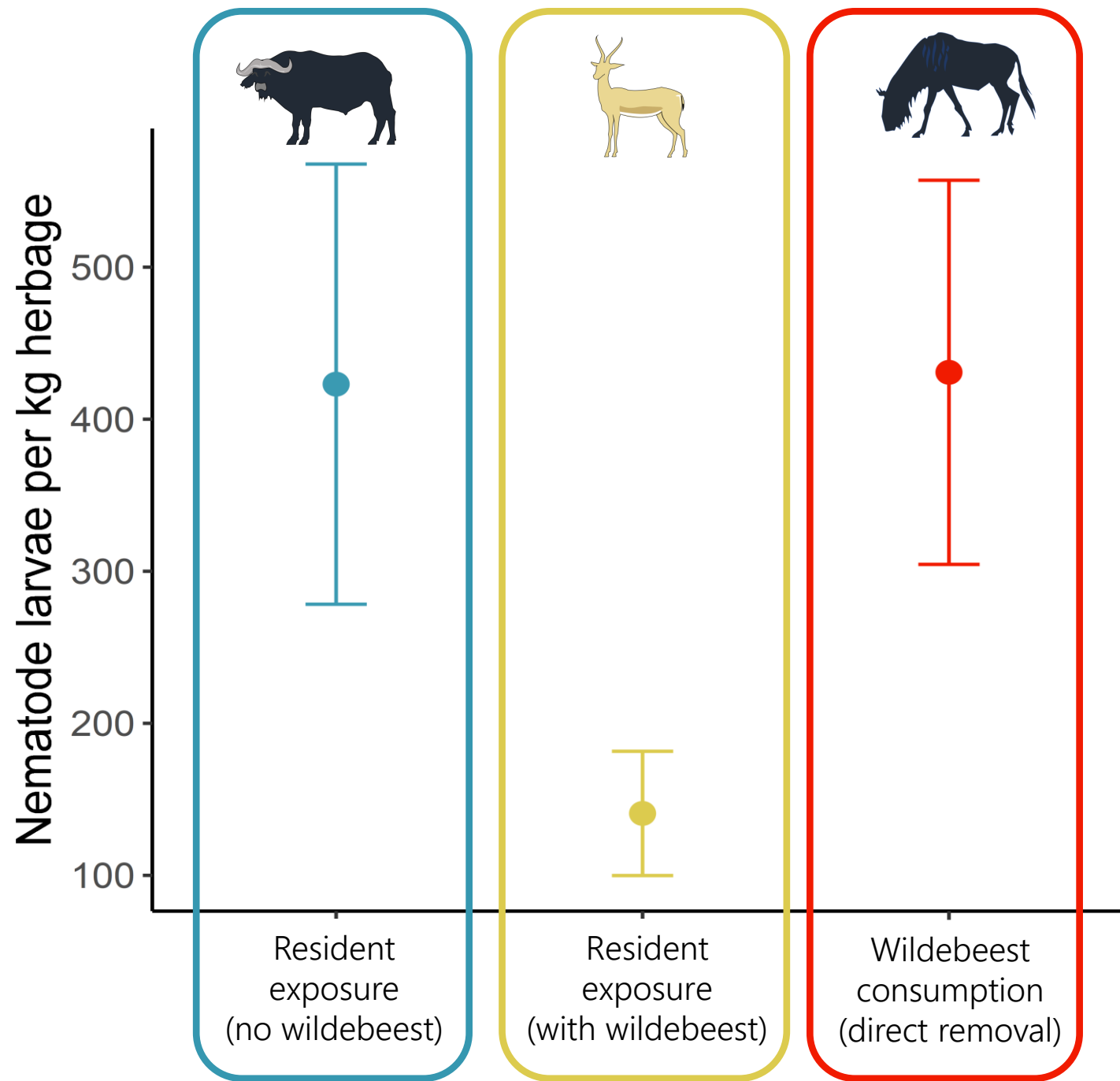
- long-dry
- short-rain
- short-dry
- long-rain





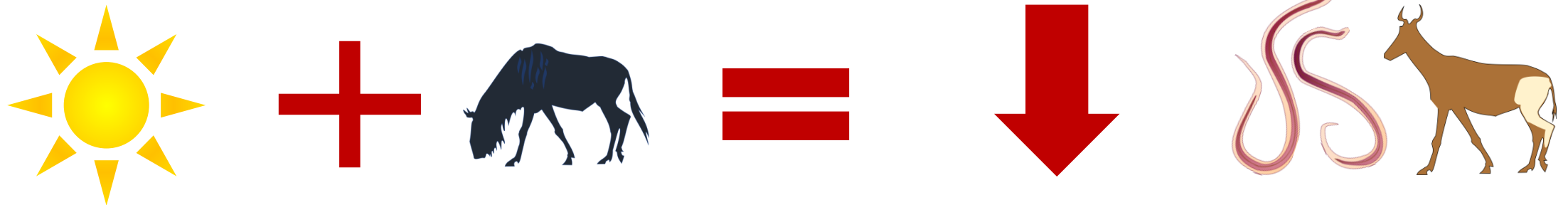






3. What are the outcomes for GIN infections in non-migratory hosts?

Seasonal conditions can switch the impact of migrants from a net **increase** to a net **reduction** of infection in residents.





Thank you



National Institute of Food and Agriculture  
U.S. DEPARTMENT OF AGRICULTURE



Biotechnology and  
Biological Sciences  
Research Council