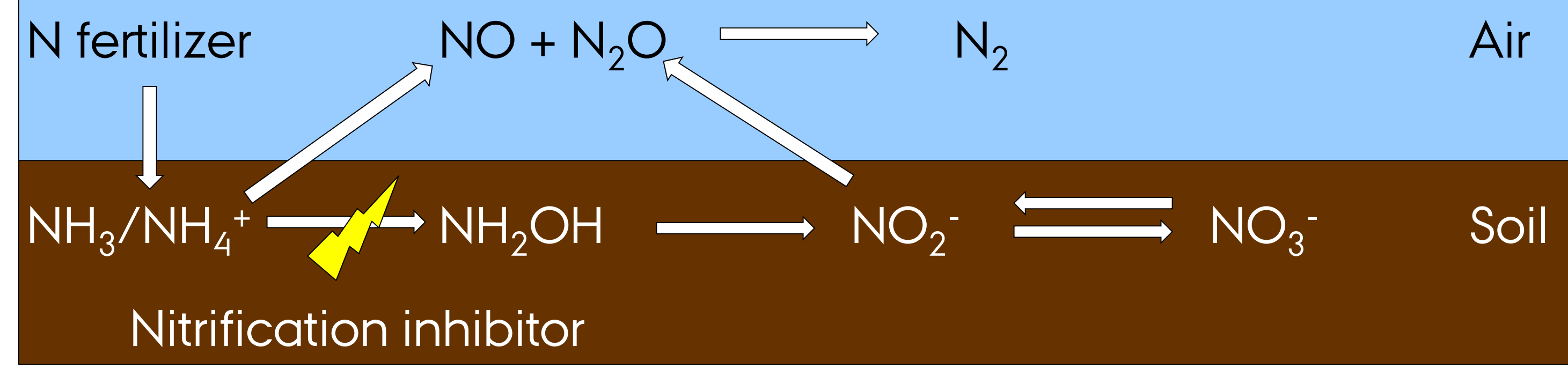


# Effects of nitrification inhibitors on Danish soil organisms

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**Objective:** Assess non-target effects of nitrification inhibitors on soil organisms at Danish agricultural conditions.

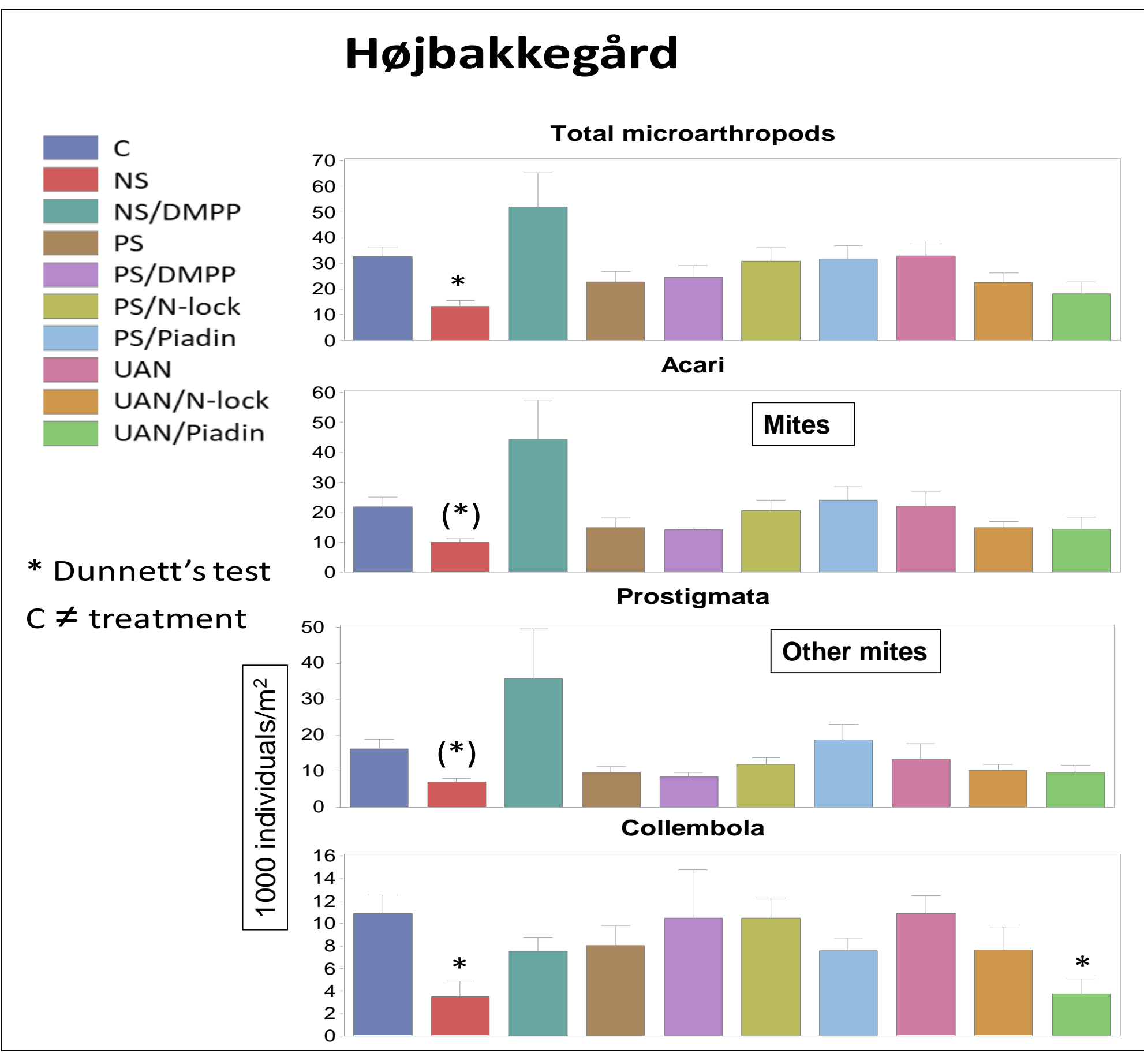
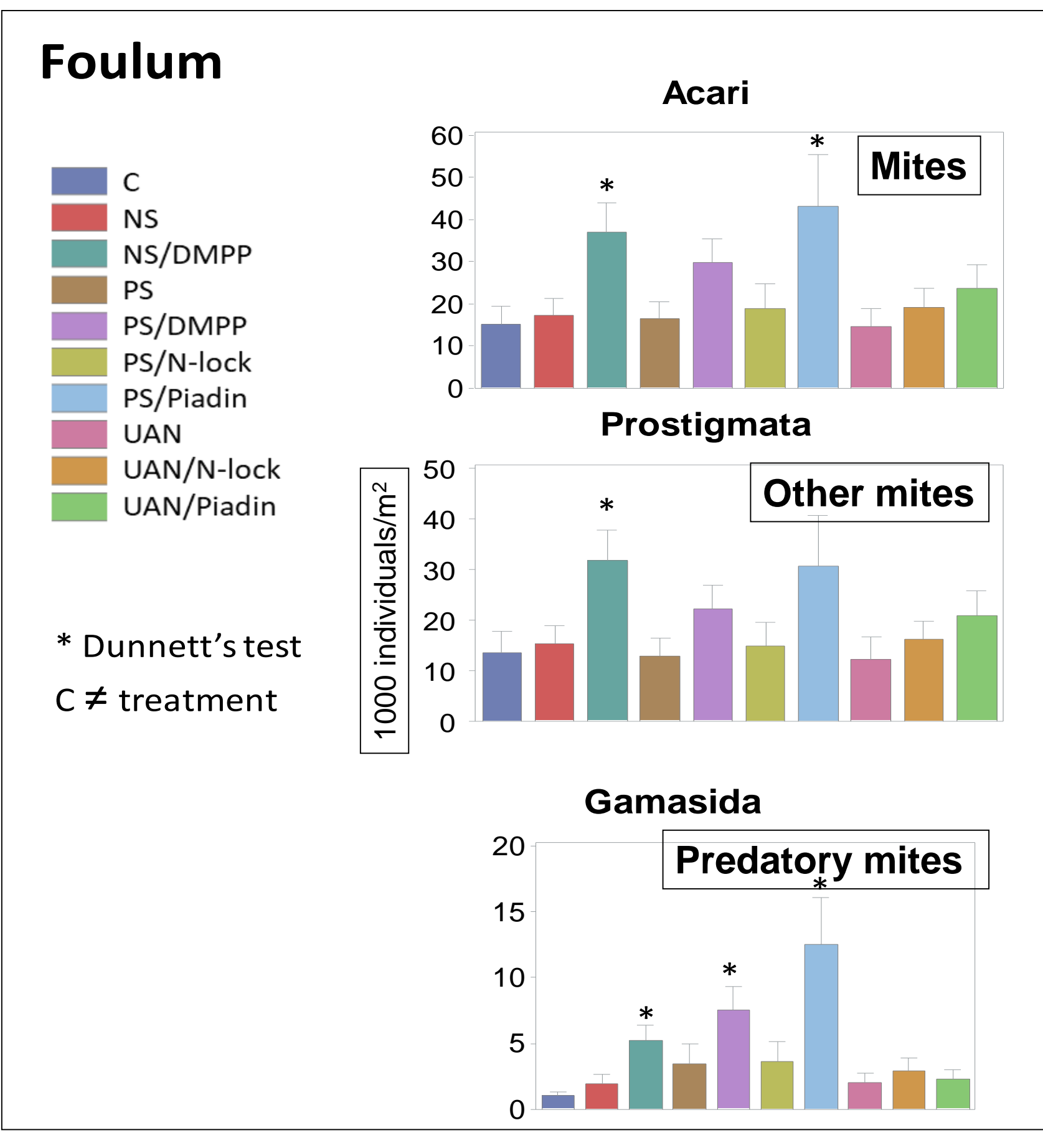
Nitrogen fertilization can lead to release of nitrous oxide (N<sub>2</sub>O). Nitrification inhibitors (NI) inhibit the first step of nitrification and are suggested as a remedy to achieve zero emission agriculture. Before widespread use of NI in Danish agriculture, there is a need for determining non-target effects of NI on the indigenous soil organisms.



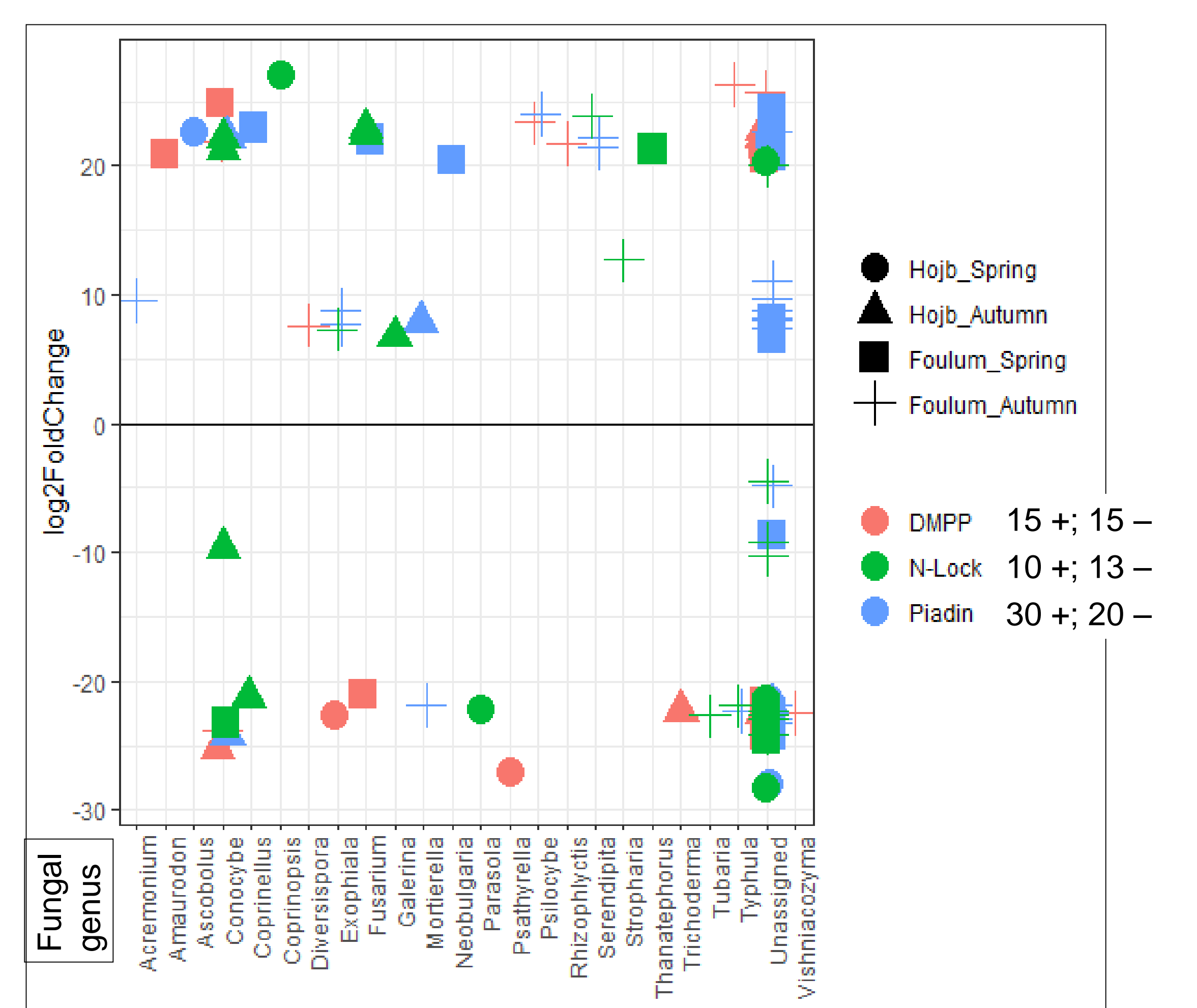
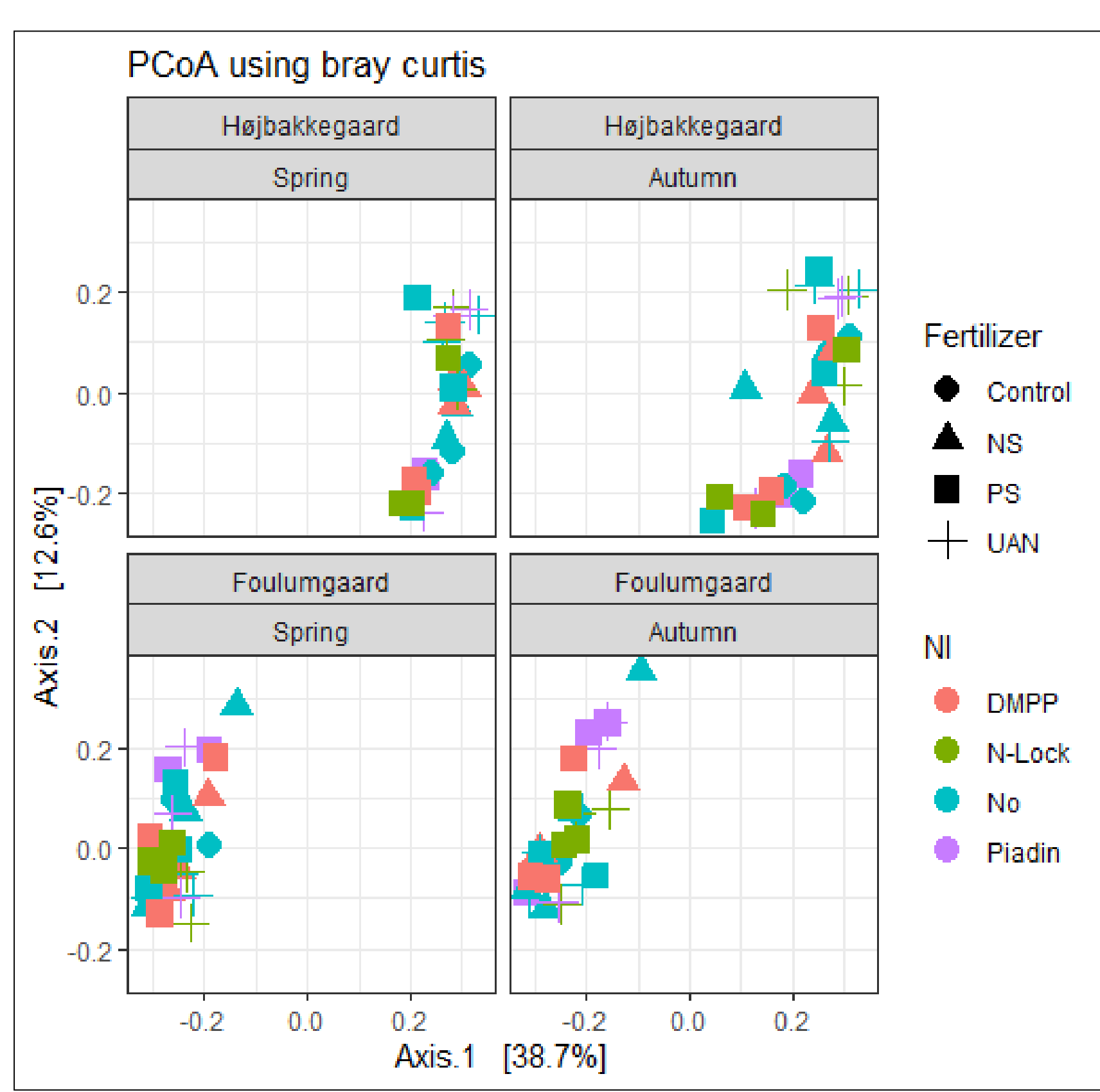
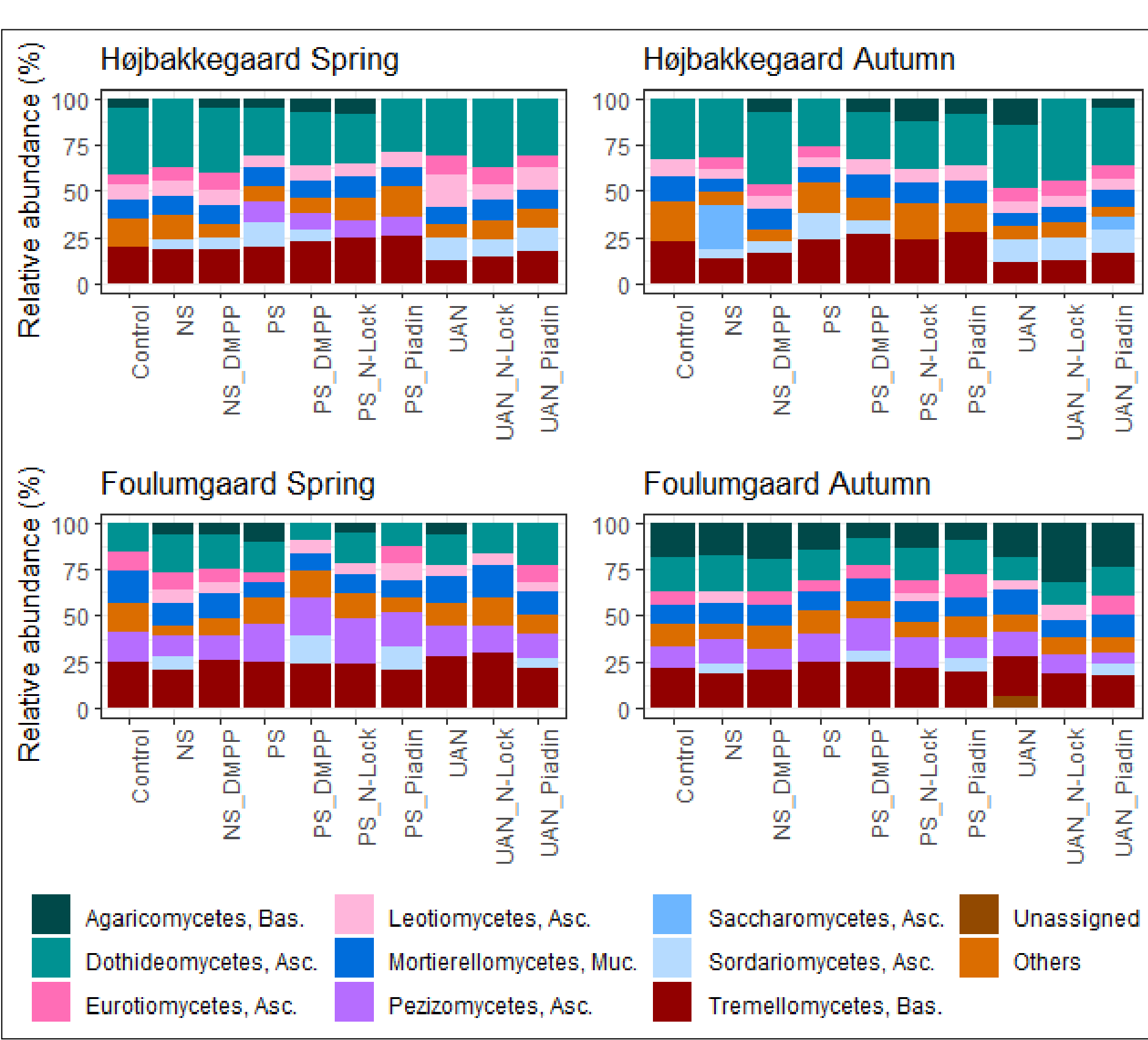
## Results: Non-target effects of NI in spring barley soil

- No significant effect on earthworm biomass and diversity
- Significant effects on microarthropod abundance
- No significant effect on soil fungal diversity though NI, esp. Piadin, affects fungal genus
- No significant effect on bacterial diversity and abundance though Piadin affects some bacteria
- In spring barley 2020 (warm and dry spring) overall limited effects of NI compared to Danish agricultural practices

Treatment
○ No nitrogen
<b>NS</b> Chemical fertilizer (BASF)
<b>NS with DMPP</b>
<b>UAN</b> Urea Ammonium Nitrate (liquid fertilizer)
<b>UAN with N-lock</b>
<b>UAN with Piadin</b>
<b>PS</b> Pig slurry
<b>PS with DMPP</b>
<b>PS with N-lock</b>
<b>PS with Piadin</b>



Effects on abundance of microarthropods showing effects of NI  
 Foulum: stimulating effect of DMPP and Piadin  
 Højbakkegaard: negative effect of NS and UAN/Piadin



Soil fungal diversity (sequencing of ITS DNA) showing significant effects of site (37%) fertilizer (5%) and time (3%) but not NI



Effects of NI on abundance of fungal genus.  
 +: more abundant; -: less abundant

Nitrification Inhibitor	Active chemical
DMPP / Vizura	3,4-dimethyl pyrazol phosphat
N-lock/N-serve	2-chlor-6-trichlormetyl pyridin (Nitrapyrin)
Piadin	1,2,4-triazol and 3-metyl pyrazol