Test af biostimulanter i landsforsøgene

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Landsforsøgene in numbers

>1000
published field trials every year

~300
Starting trials with biostimulants



135
Eligible field trials

36
products

259
comparisons

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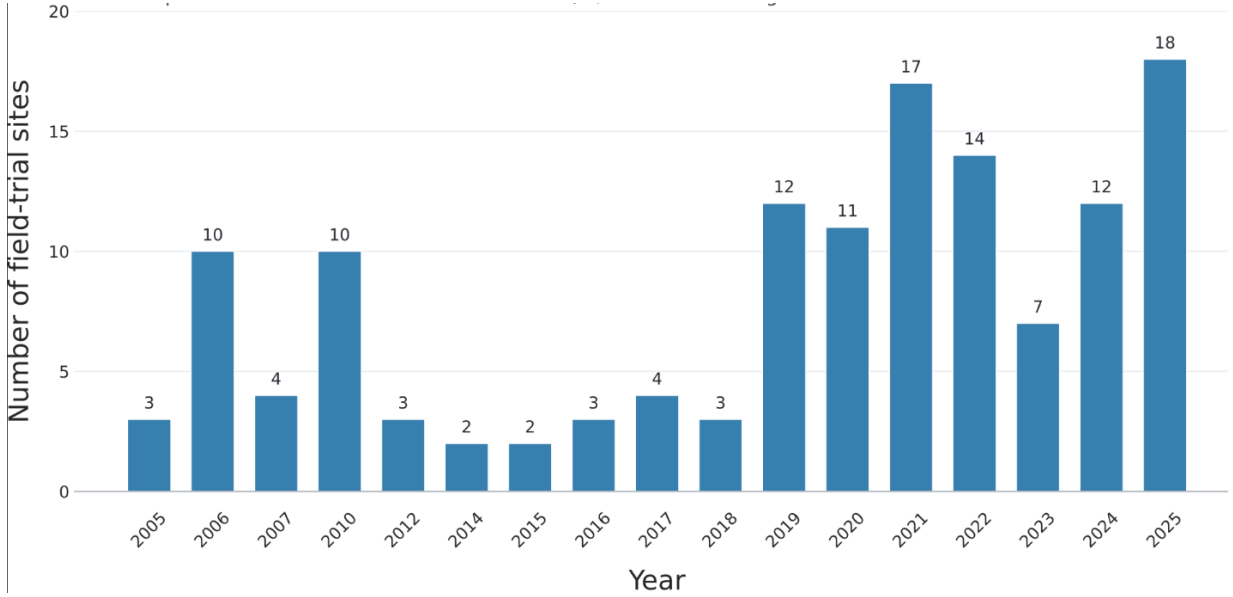
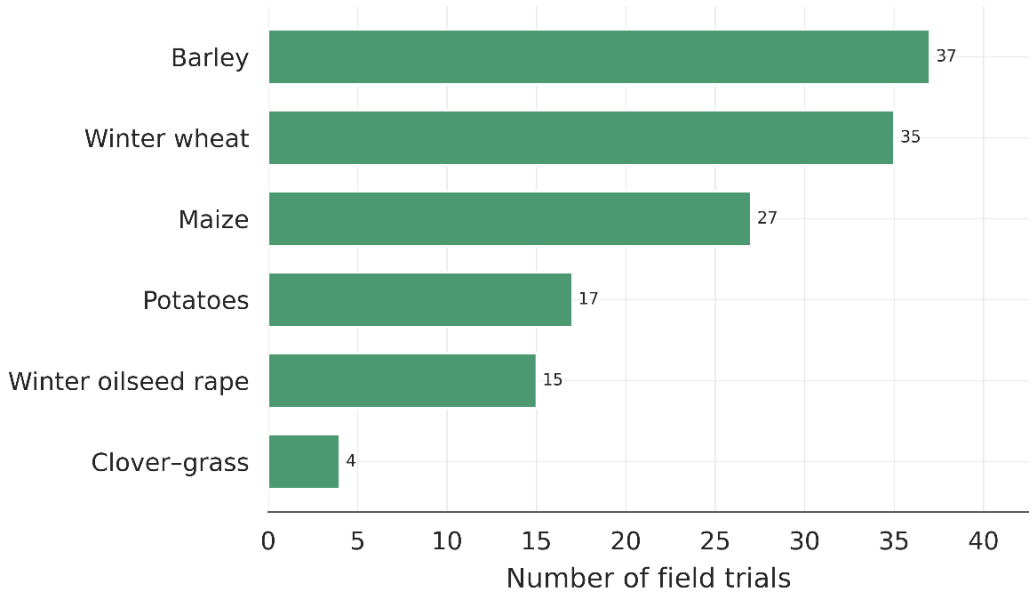
Biostimulant trials by year and crop

Field-trial sites per year



Field trials per crop



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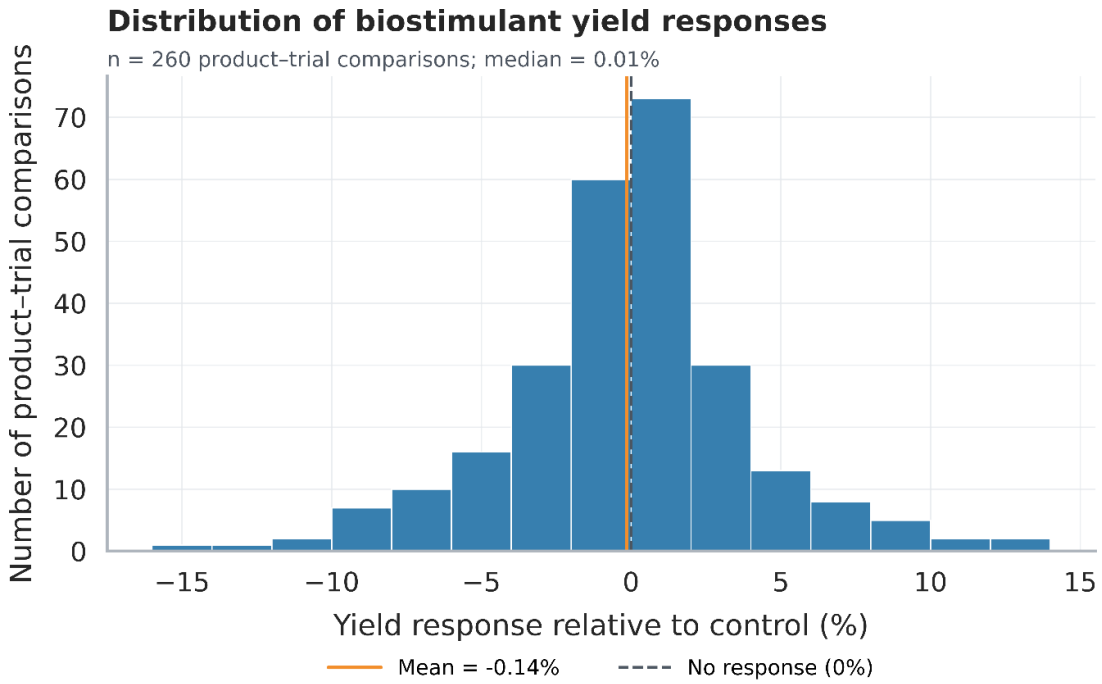
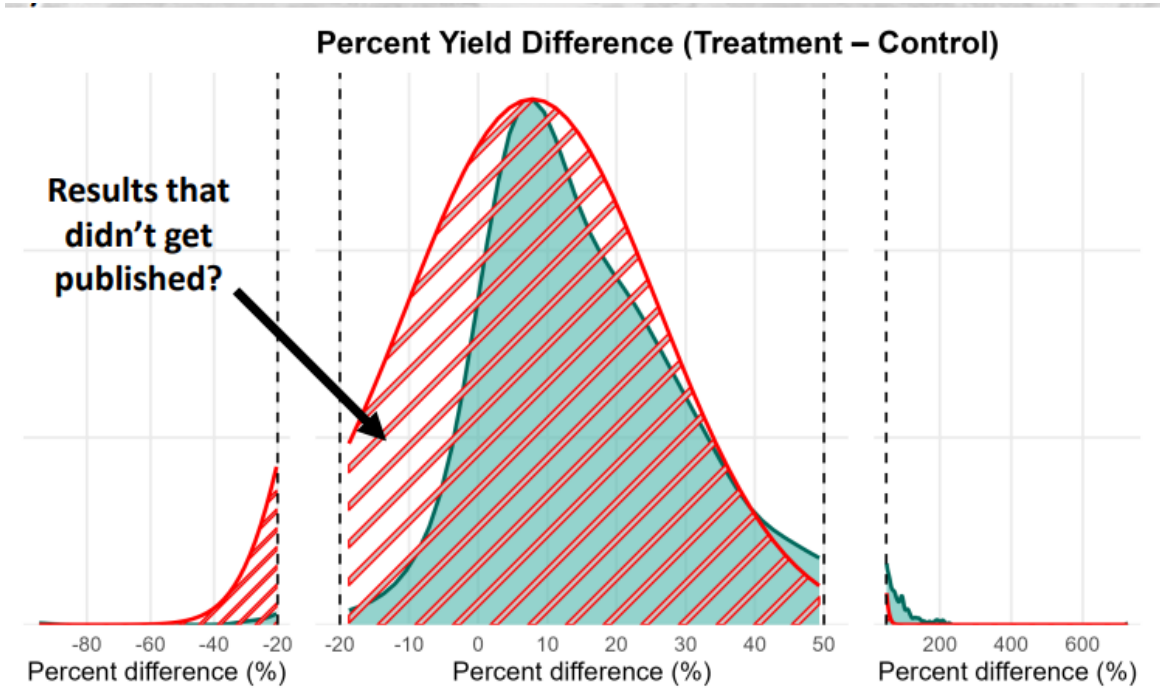
Distribution of yield responses





Source: Li et al., 2022. A Meta-Analysis of Biostimulant Yield Effectiveness in Field Trials

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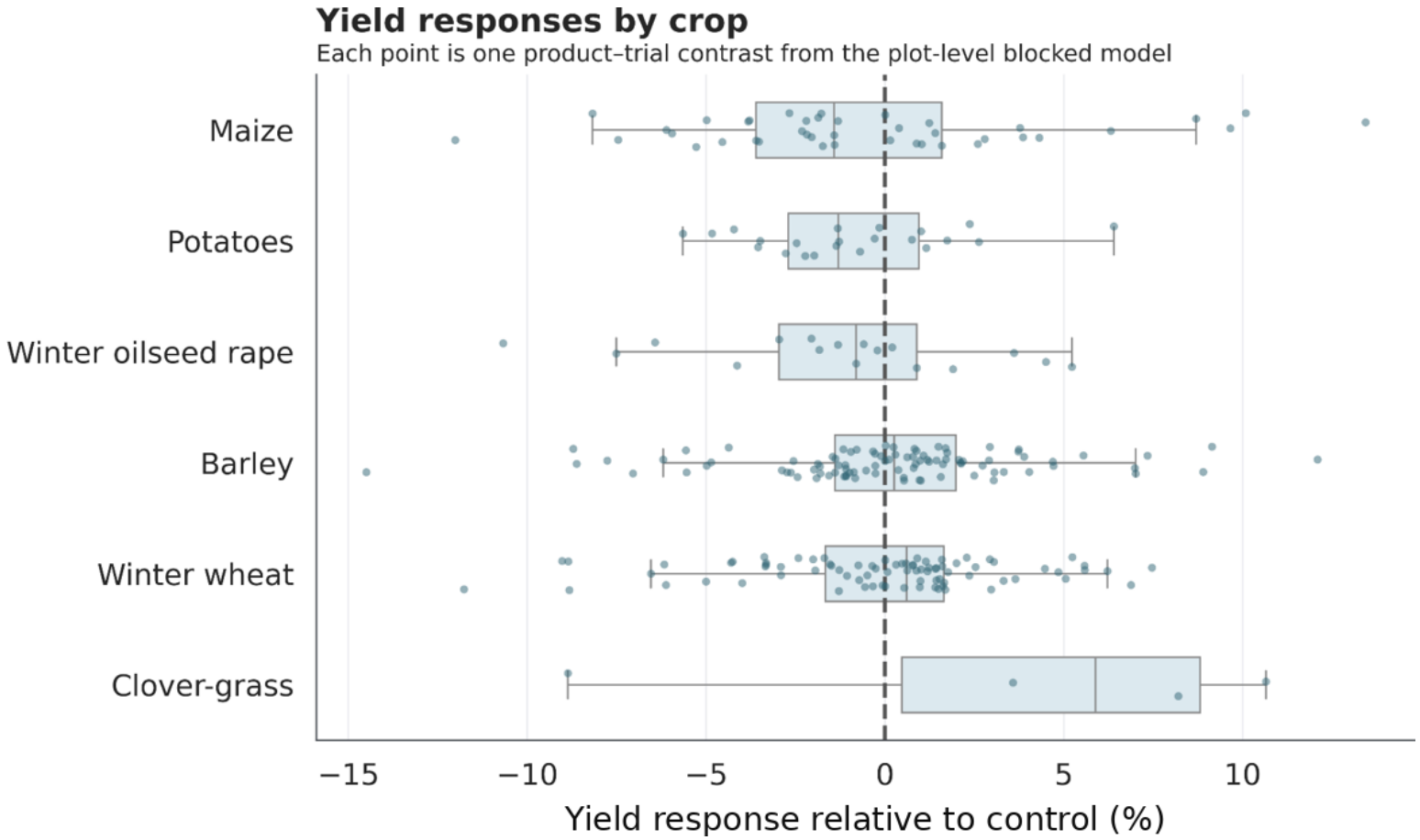
Structure of field trials

- 4 replicates
- 15-30 m²
- Farmer´s field availability
- Appropriate controls
- Updated protocols

We can meet a lot of criteria



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Responses are generally small and highly variable

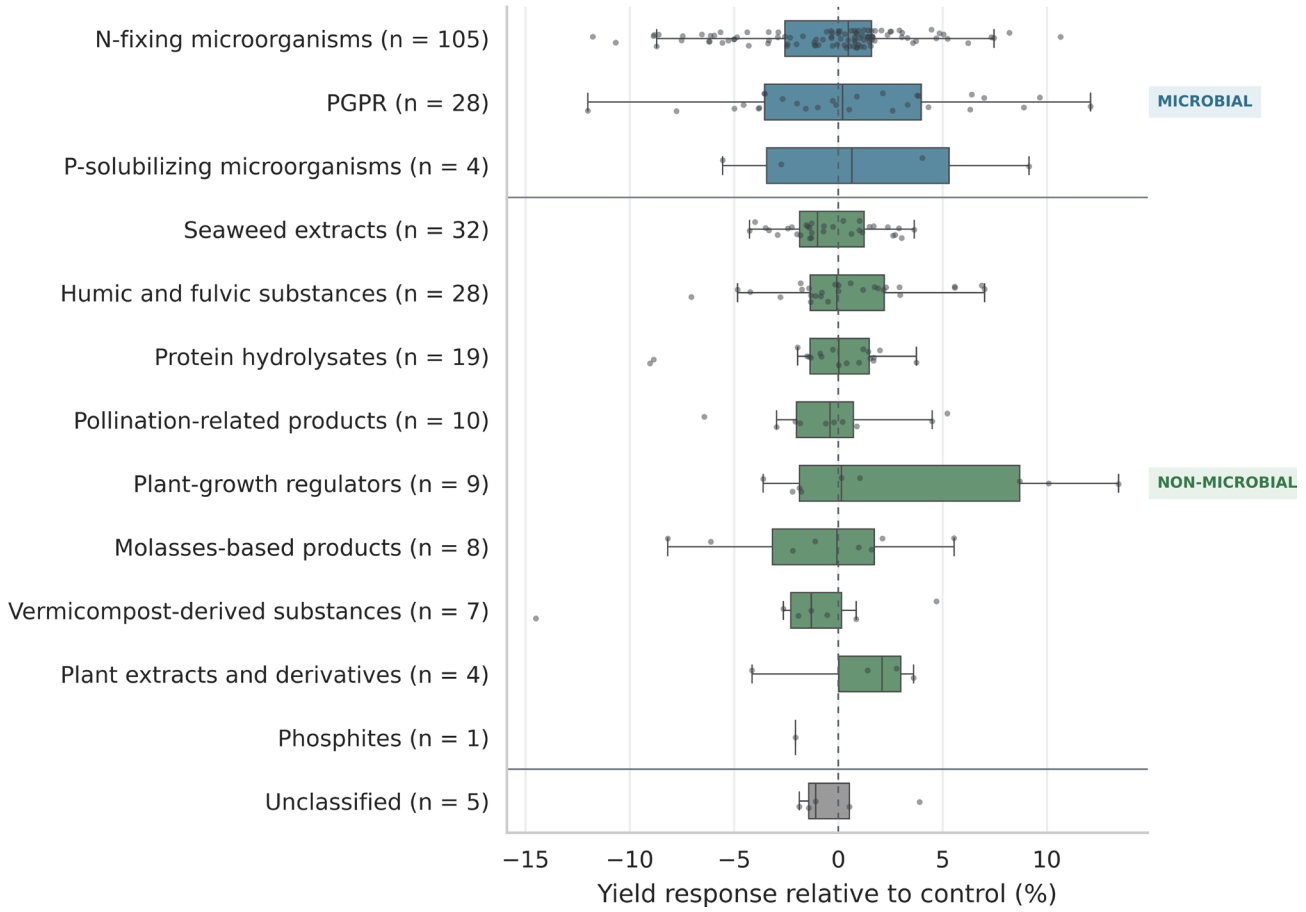
N-fixing microorganisms represented the largest evidence base (n = 105)

Other PGPR products showed more positive responses

Non-microbial categories were represented by fewer observations

10% higher yield than the corresponding control ≠ significantly increases yield by 10%

not significant ≠ no effect



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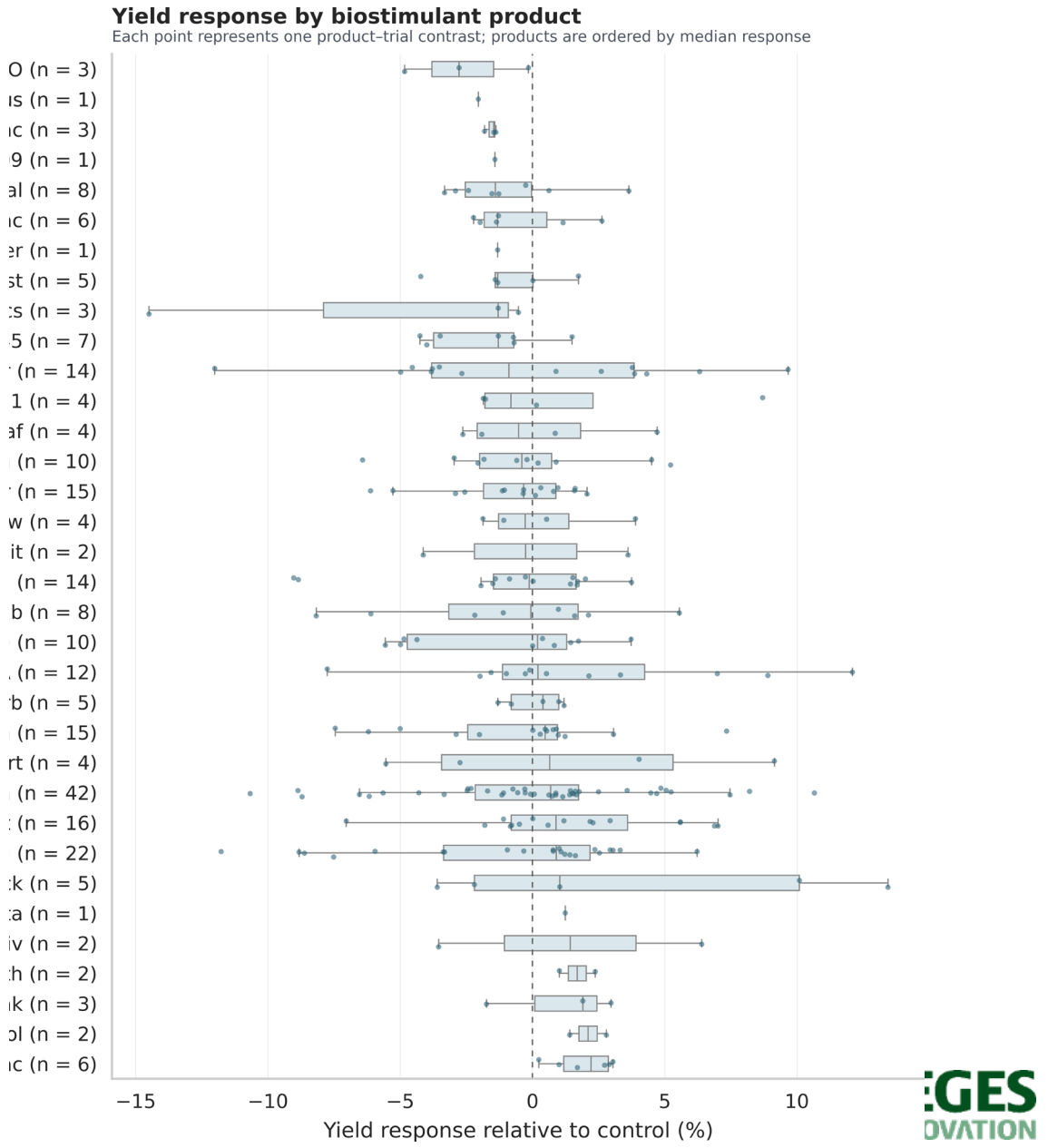
Variation

Within subgroups, individual products also exhibited variance

We need to understand why we can see effects in some trials

But it is as important to understand why we do not see effects in other trials



What can we do better

1
Field trials

2
Technologies

3
Beyond yield

4
Data sharing with companies

5
Site-specific recommandations

6
Reaching farmers



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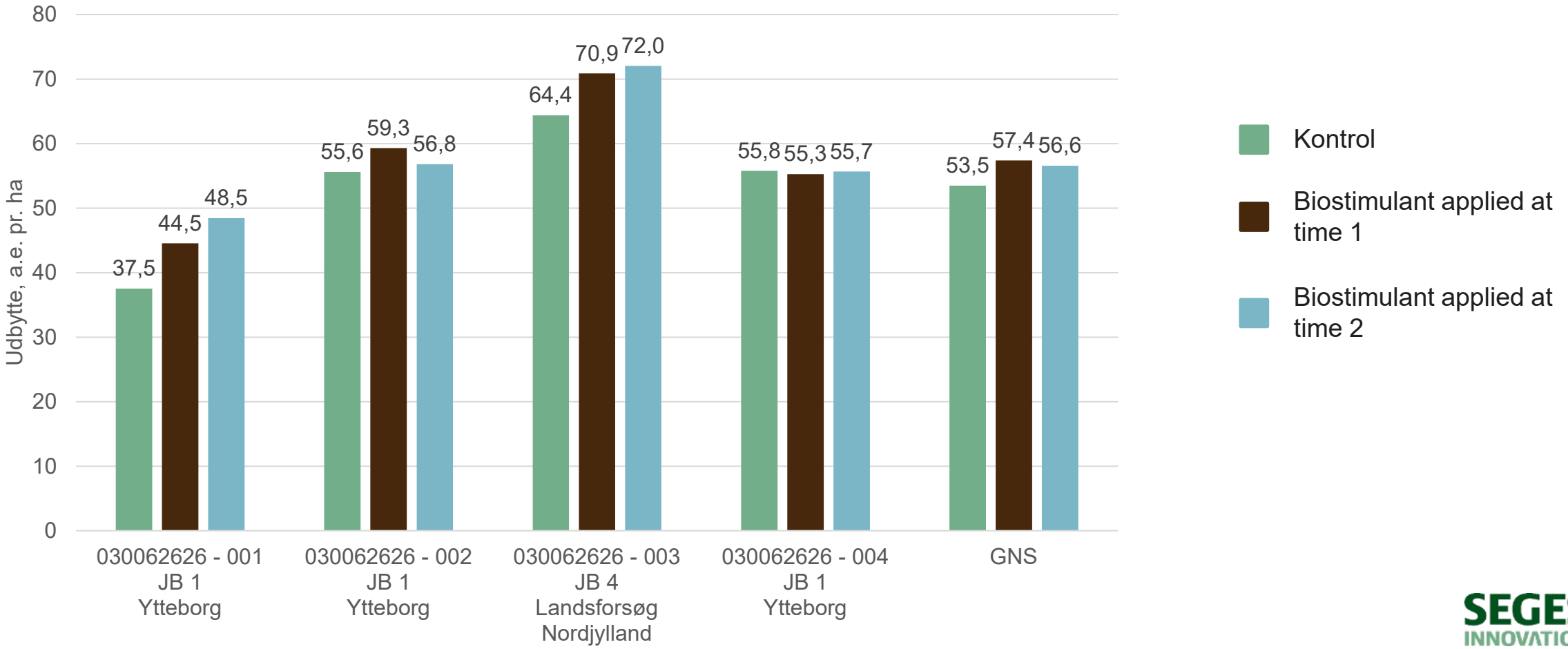

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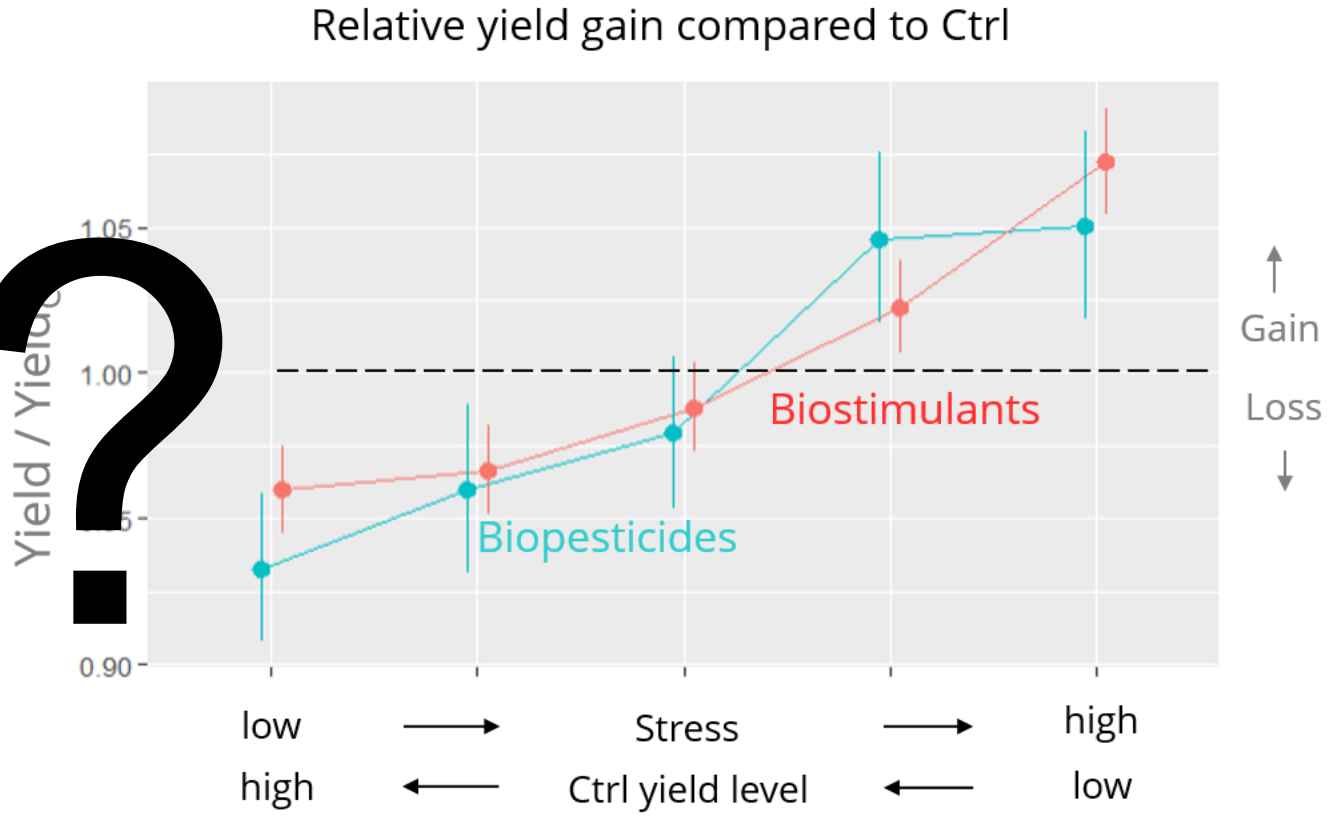
Meta-regression

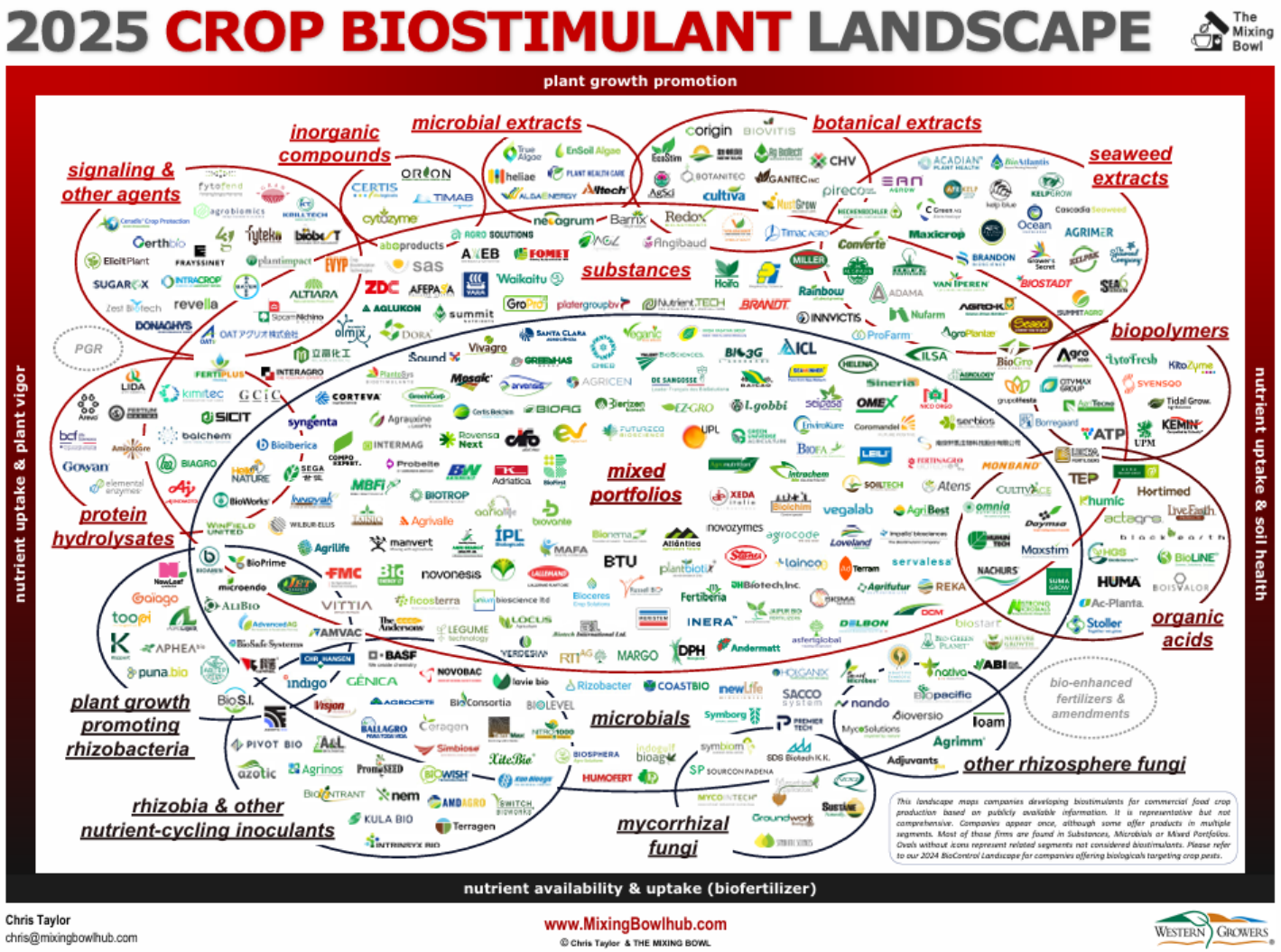
- **Statistical model:**
  - $\log(Yield / Yield_{Ctrl}) = b_0 + b_1 * Product_group + b_2 * \mathbf{Stress}_{Ctrl} + b_3 * Product_group * \mathbf{Stress}_{Ctrl} + random_effects$
    - Where $\mathbf{Stress}_{Ctrl}$ is a **stress-proxy variable** quantified as the quintile-discretized negative crop-specific standardized yield of the control, i.e.
      - $\mathbf{Stress}_0 = (-1)(Yield_{Ctrl} - \mu(Yield_{Ctrl})) / \sigma(Yield_{Ctrl})$
    - The control treatment yield level is assumed to reflect the integrative response to all experienced stress conditions.

	F-value	P-value
Product group	$F_{1,334.08} = 0.36$	0.54
Stress	$F_{4,1256.45} = 39.47$	<0.001***
Product group × Stress	$F_{4,1334.04} = 2.62$	0.034*



- In the meta-regression, a **significiant differential treatment effect was found ($p < 0.001$)** for both product groups.

Products need to deliver the benefits they are marketed for



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