

Variation in response between inputs focus: transferability of research results

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APPLIED PLANT RESEARCH
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Back grounds for **variation** in response

between inputs

- Climate (year, region, country, latitude, altitude)
- Soil type
- Crop rotation
- Cropping system (no tillage, field burning, cover crop/open land drilling)
- Species, type, variety
- Harvest year (first, second, third.....)
- Availability and rate of pesticides (growth regulator, herbicides)

Mostly combination of many points

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Variation in grass seed field

- between plants (genetic background)
- within plants (age of tillers)



Variation due to climate: comparison between Denmark and the Netherlands

- My first idea (1986/1987): very similar (short distance, same climate)
- Substantial difference in nitrogen fertilization (example)

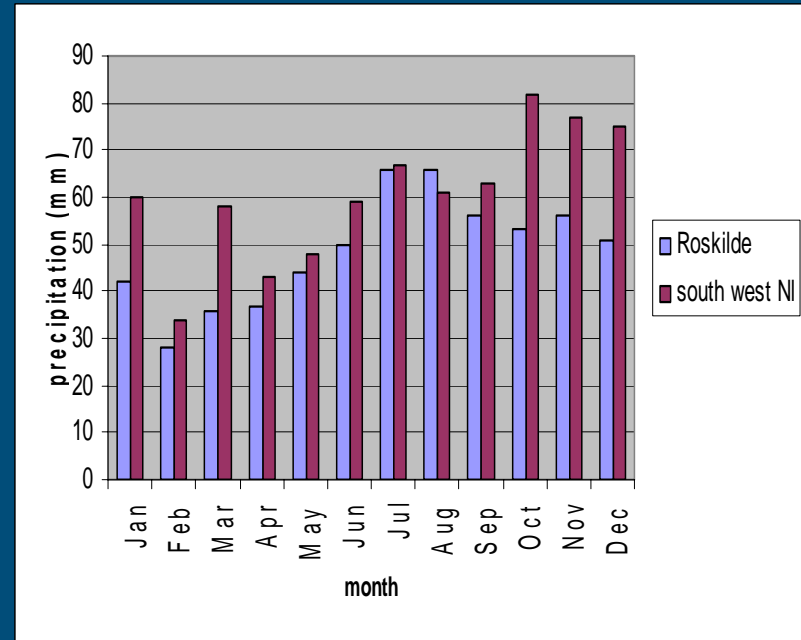
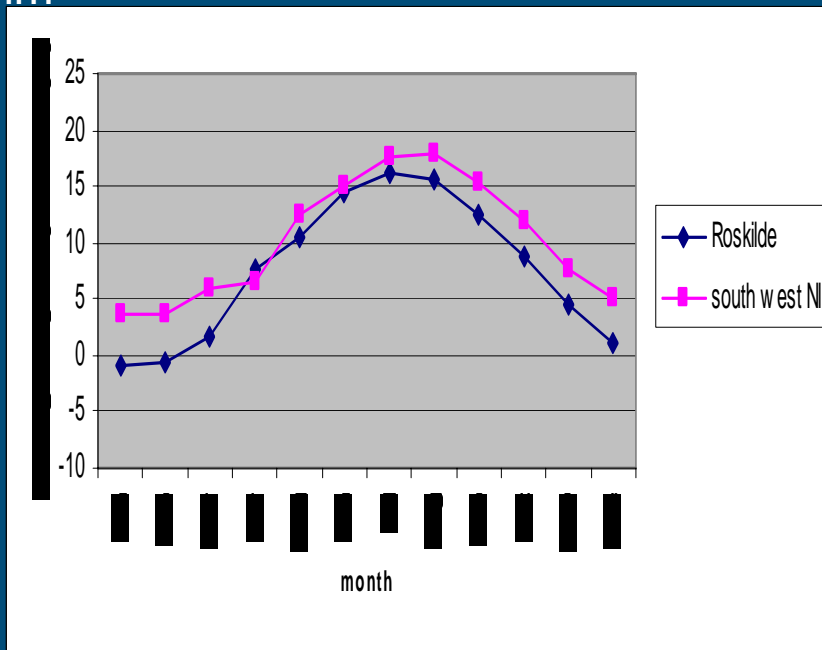
Festuca rubra commutata	first harvest		second harvest	
	autumn	spring	autumn	spring
Denmark (Nordestgaard, 1999)	40-50	60-70	70-80	30-40
the Netherlands	30	85	45	85/115*

* Moddus



Comparison Denmark / the Netherlands

- Latitude: Roskilde (Denmark) 55°39'N, 12°05'E, Lelystad (the Netherlands) 52°32'N, 5°33'E
- Average day temperature Roskilde 7.7 °C, south west of the Netherlands 10.2 °C
- Precipitation per year Roskilde 585 mm, south west of the Netherlands 727 mm



Variation due to crop rotation: comparison of the Netherlands, Denmark, Oregon

- the Netherlands intensive crop rotation (high amount of fertilizer) with sugar beets, potatoes, vegetables. Grass seed crop is minor crop, perennial ryegrass far out dominant, mostly one harvest year
- Denmark: less intensive crop rotation (spring barley, white clover, *Poa pratensis* (several years))
- Oregon: monoculture grass seed crops not rare



Variation due to pesticides: comparison of the Netherlands/Denmark and Oregon

- Herbicides: NW Europe cannot apply diuron, sulfentrazone, pronamide, norfluraxon (Cole et al., 2005: carbon seeding) etc.
- Growth regulation: rate of trinexapac-ethyl in NW Europe is restricted to 0.8 L/ha Moddus (250 EC) = 200 g a.i./ha
In Oregon higher input (until 600 g a.i./ha) (Silberstein et al., 2002) and 400 g a.i. (Chastain et al., 2003) with more impressive results in first, second and third harvest crops of perennial ryegrass



transferability of research results

- Fundamental research (physiology): results mostly less affected by location → good transferability
- Applied research: mostly strongly affected by location → reasonable/low transferability
 - Comparing results across countries (Rowarth et al., 1998/1999: 0, 50, 100, 150, 200 kg N/ha) low value
 - Understanding the backgrounds for the differences useful
 - Transferability more qualitative than quantitative
 - Qualitative transferability (for instance: active ingredients, global approach/methodology)



Thanks for your attention, the floor is to you!

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