Future challenges in early blight control

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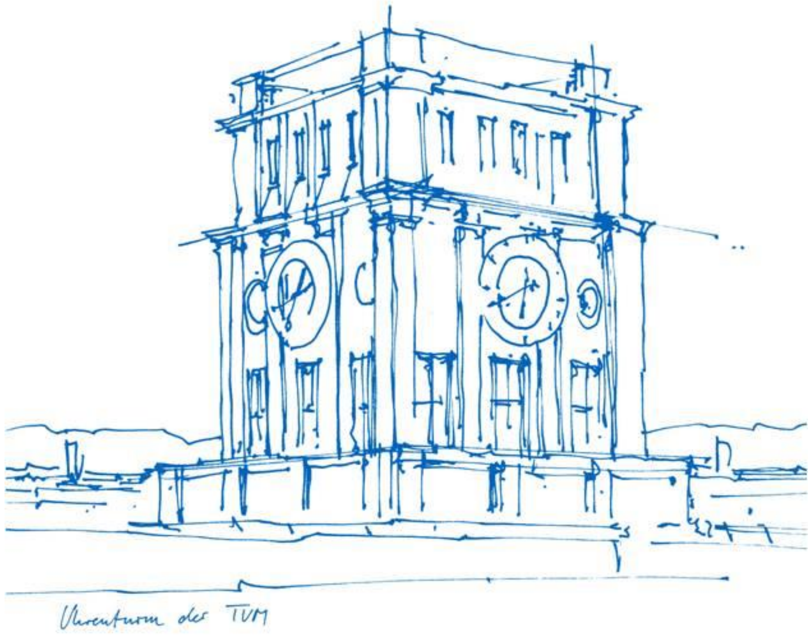
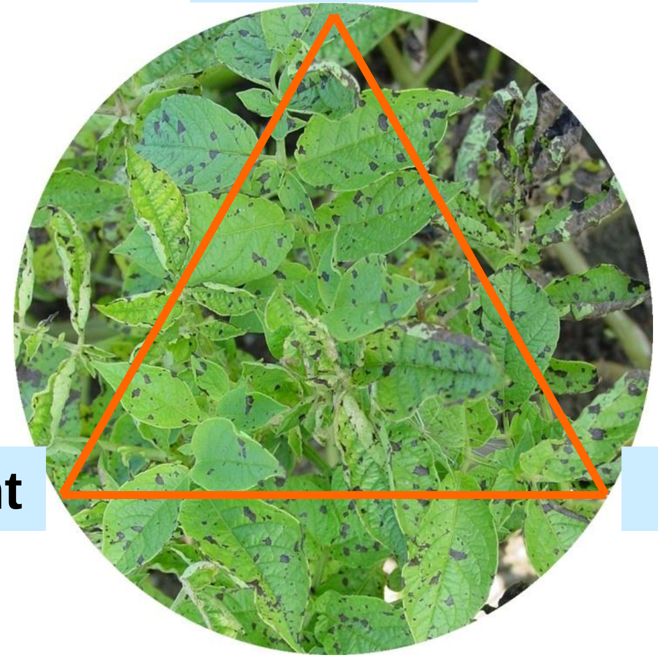


Future challenges in early blight control

Chemical control

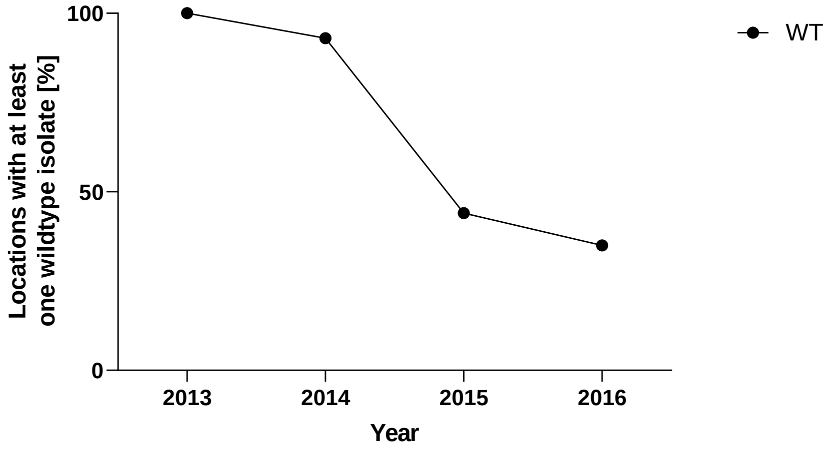


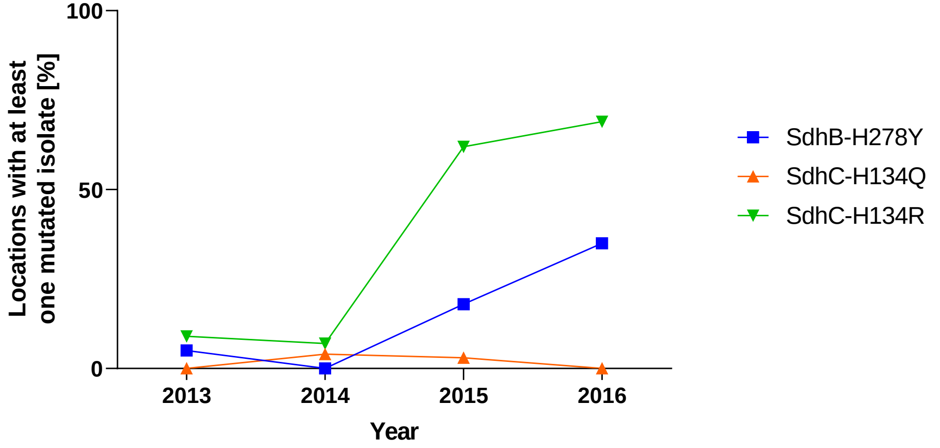
Chemical control

- QoI-fungicides – mutations already widespread (F129L)
- SdhI-fungicides – number of mutated isolates is increasing (*Sdh*B-, *Sdh*C-, and *Sdh*D-subunits)
- DMI-fungicides – no mutations in *A.s*. so far (but in other pathosystems)

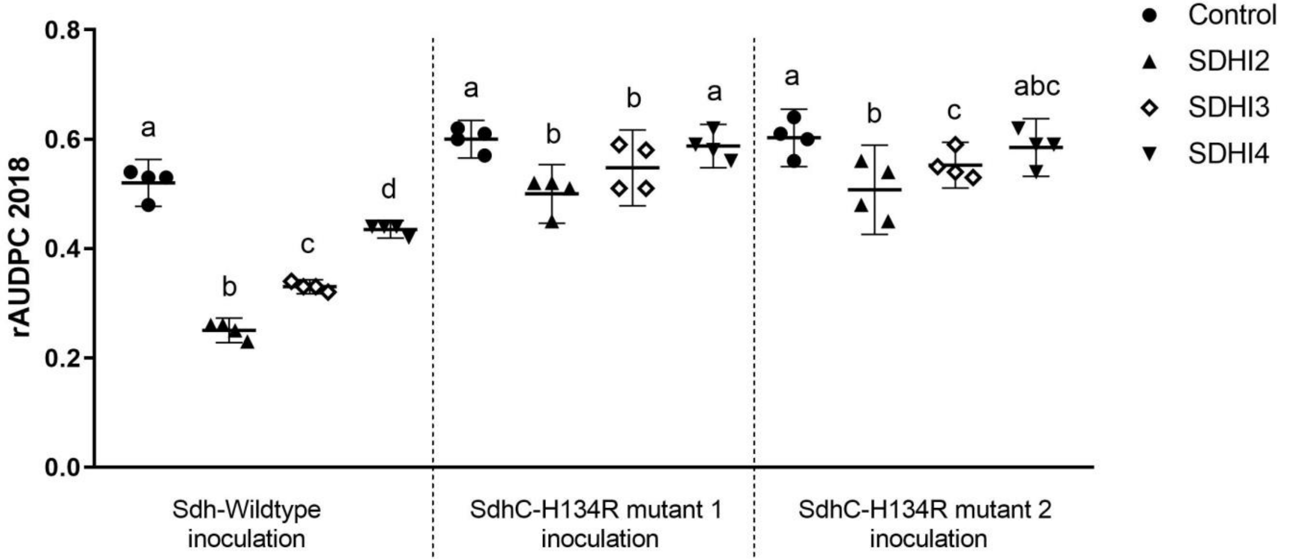
Chemical control (SDHIs)

Monitoring in Germany (Metz et al. 2019)





Field trials with artificial inoculation in Germany



Anova Tamhane T2 test, α=5%

Chemical control

- QoI-fungicides – mutations already widespread (F129L)
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Mancozeb will no longer be available in the EU

↓

Farmers need to apply specialists more often to control early blight

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Selection pressure will increase

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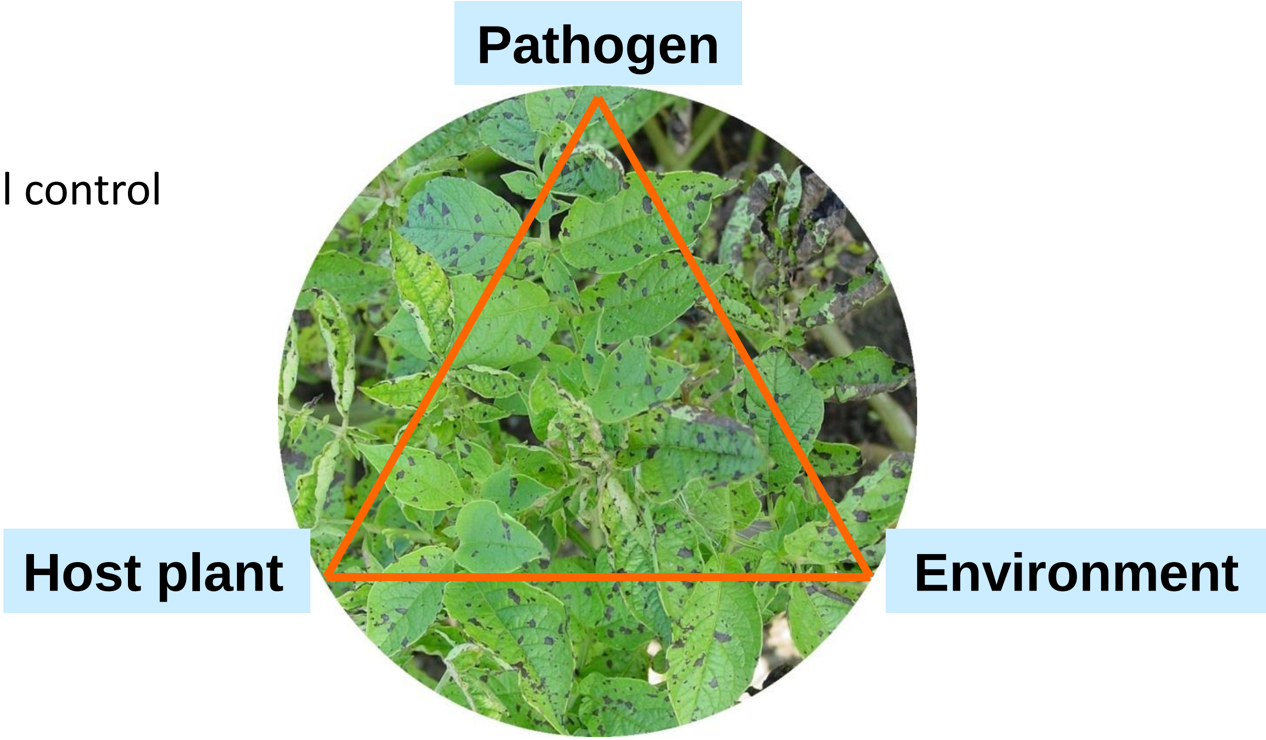
Number of mutated isolates will increase

Future challenges in early blight control

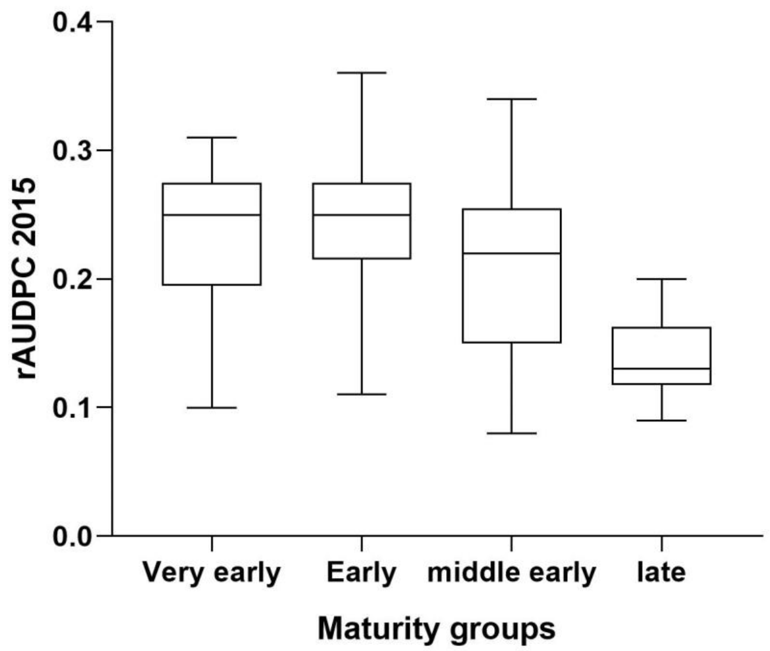
Chemical control

Biological control

Cultivar



Cultivar (only one trial in Germany)



High variation within each maturity group

→ Breeding potential!

Alternaria-resistance/tolerance is often not included in potato cultivar lists

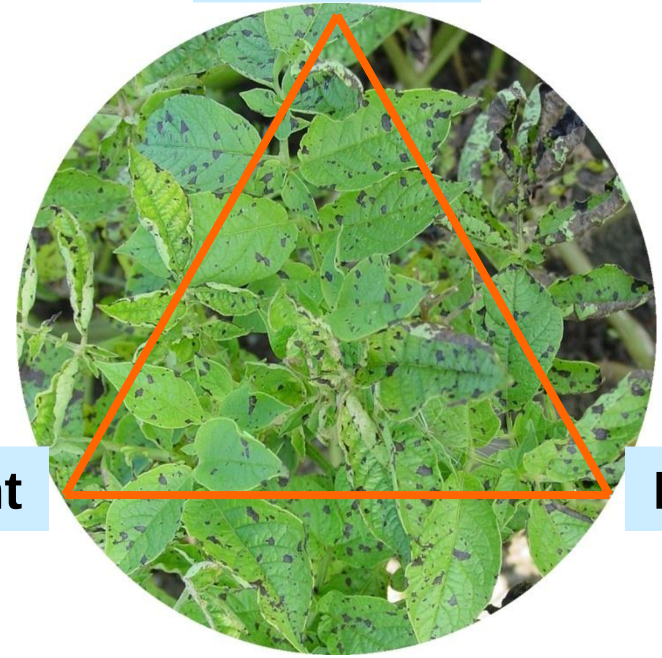
→ Could be included in future

Future challenges in early blight control

Chemical control

Pathogen

Biological control



Fertilization

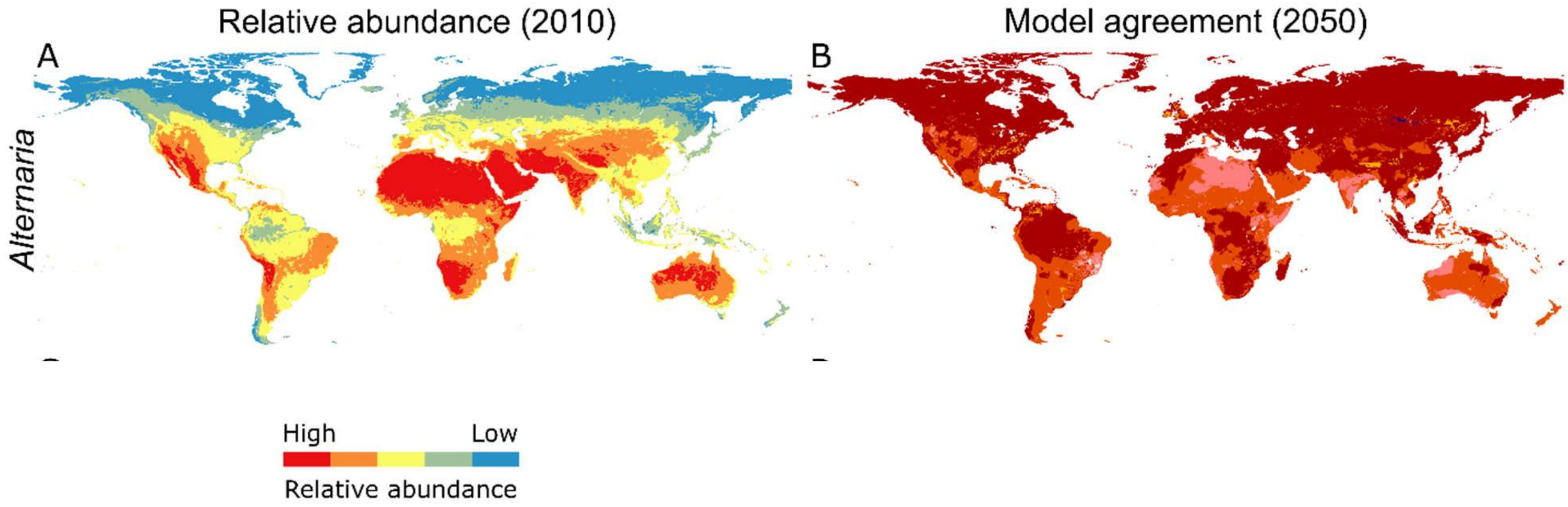
Cultivar

Host plant

Environment

Climatic changes

Climatic changes



➡ Soil-borne inoculum of *Alternaria* will increase

➡ Disease pressure in the field will increase

Delgado-Baquerizo et al. 2020; nature climate change

Climatic changes

Influence of rising temperatures: Greenhouse trials

- 3 different temperature conditions (18, 22, 26°C)
- 5 A. solani isolates
- First 24h in infection tent at 22°C and nearly 100% RH
- Afterwards in climate chambers with different temperatures
- Rating of disease severity after 5 days

➡ Clear increase in disease severity at higher temperatures

Climatic changes

Leaf wetness duration: Greenhouse trials

- Leaf wetness duration from 6 to 24h post inoculation
- 3 A. solani isolates
- Rating of disease severity after 5 days

➡ 8h of leaf wetness are sufficient for successful infection

➡ Even with less rain events in the future, we would have enough LW in the field caused by dew and irrigation

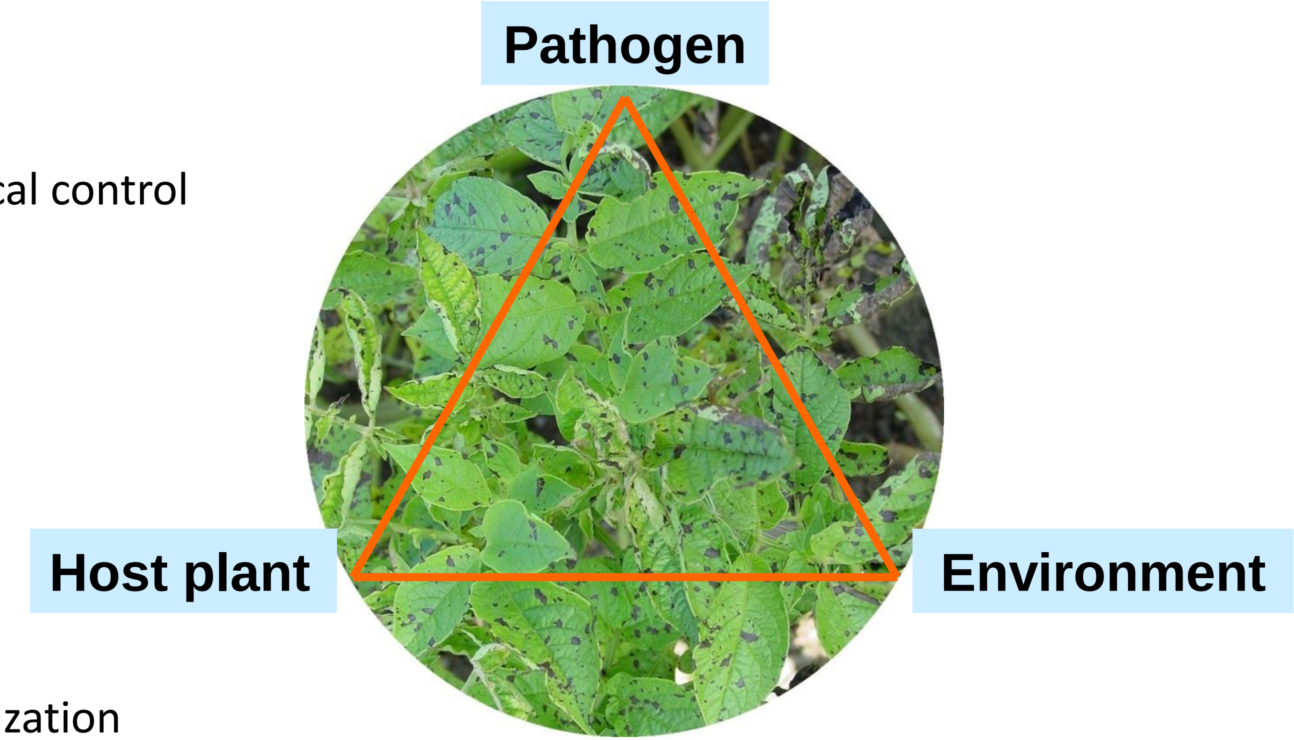
Vloutoglou and Kalogerakis, 2000:
-> influence of tomato cultivar on minimum leaf wetness duration

Probably potato cultivar also plays an important role here

Future challenges in early blight control

Chemical control

Biological control



Cultivar

Fertilization

Climatic changes

EuroBlight

A potato late blight network for Europe

Thank you for your attention

- <u>Special thanks to:</u>
- Hans Hausladen
- Ralph Hückelhoven