



# Importance of crop protection in sugar beet: research, monitoring and diagnostics

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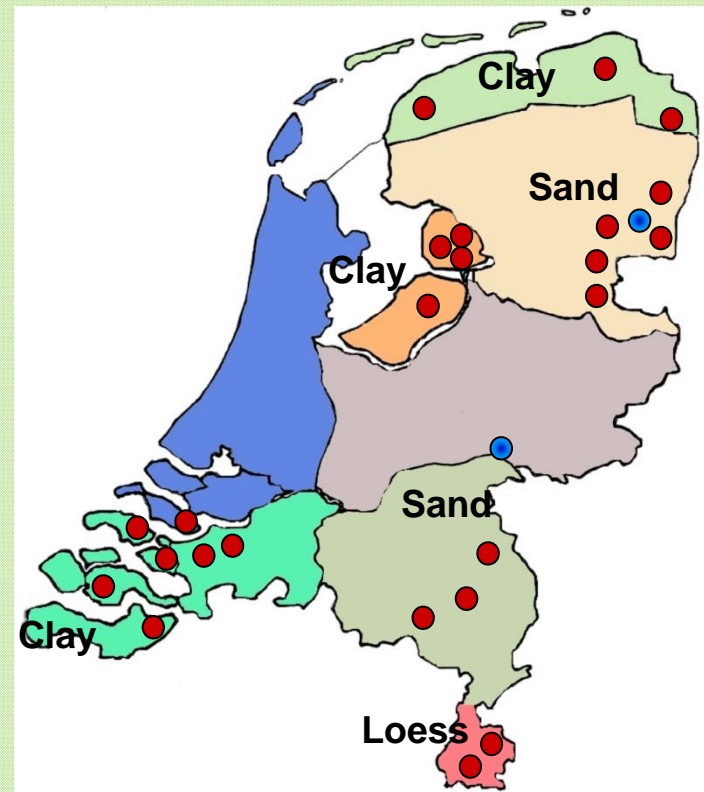
# Contents

- ▶ Research on the importance of crop protection
- ▶ Monitoring
- ▶ Diagnostic service

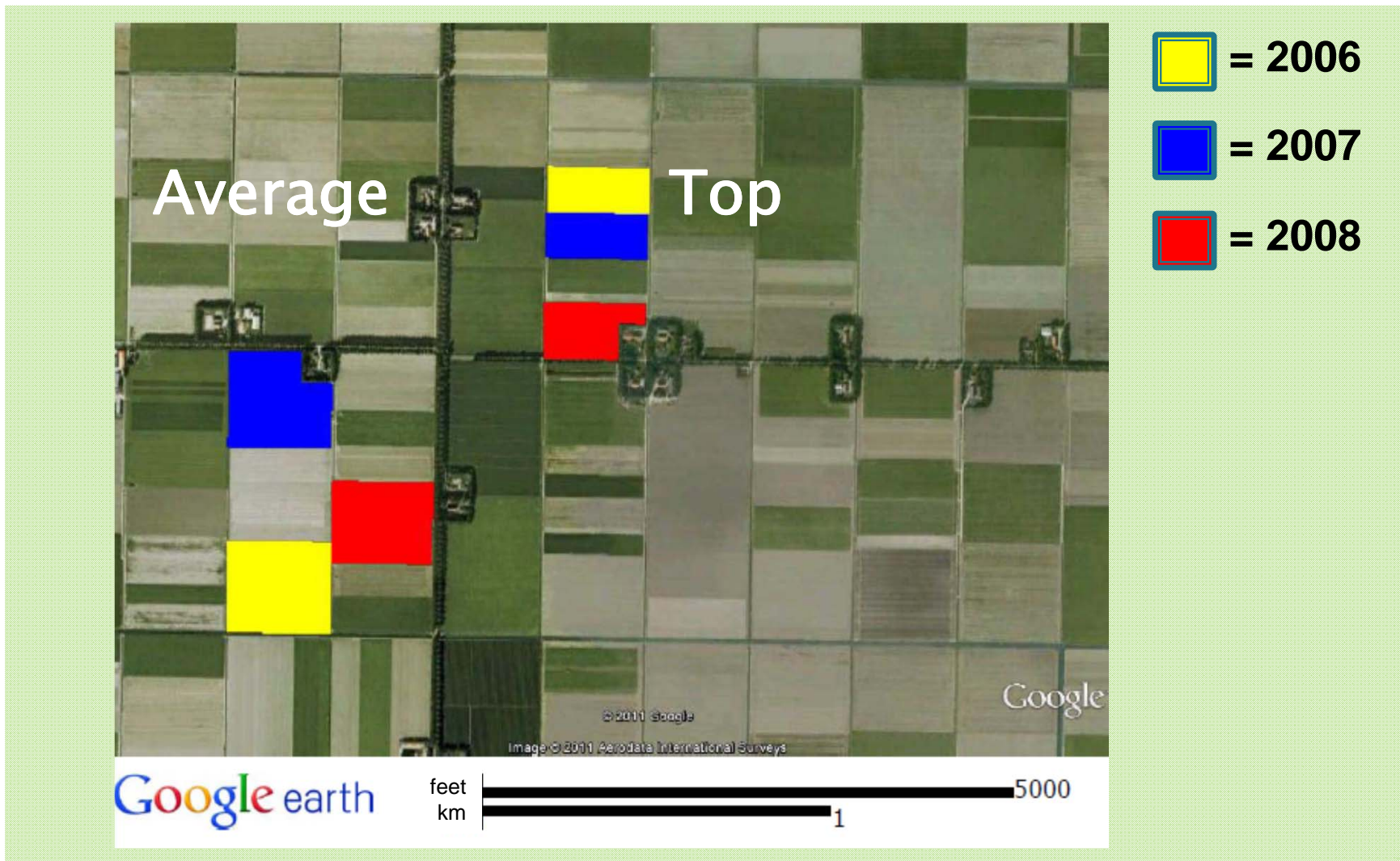
# Importance of crop protection

## Pair study with 26 pairs (SUSY)

- ▶ 2 neighbouring growers
- ▶ 'top' grower
- ▶ 'average' grower
- ▶ at least 1.5 ton/ha difference in sugar yield



B.Hanse, 2011



**Comparable soil and climate within a pair!**



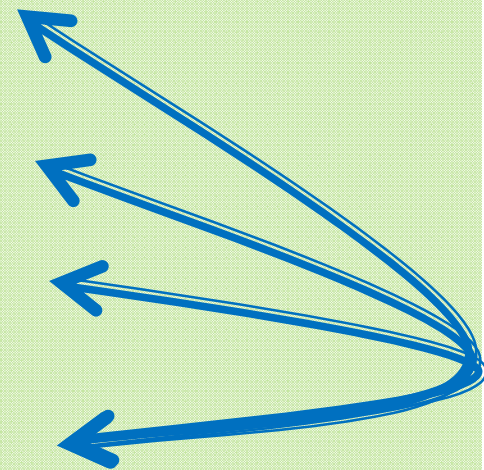
# Result

during the project,  
**TOP** growers had **20%** higher sugar yields



# Differences in sugar yield levels are due to:

- ▶ Management → quality of inputs
  - Soil structure explained 25% of variance in sugar yield
  - Sowing date explained 14% of variance in sugar yield
  - Weed control explained 30% of variance in sugar yield
  - Pests and diseases explained 50% of variance in sugar yield



Hanse, B. et al, 2011

# Top growers' fields lower infestation levels

on clay soils:



**Heterodera schachtii:**  
4.4x lower!



**Rhizomania: 2.7x lower!**

**35%** of variance in sugar yield explained by  
**Rhizomania, *H. schachtii* and sowing date**

Data SUSY 2006-2007

# Top growers' fields lower infestation levels



cercospora: 1.4x lower!

*H. betae*

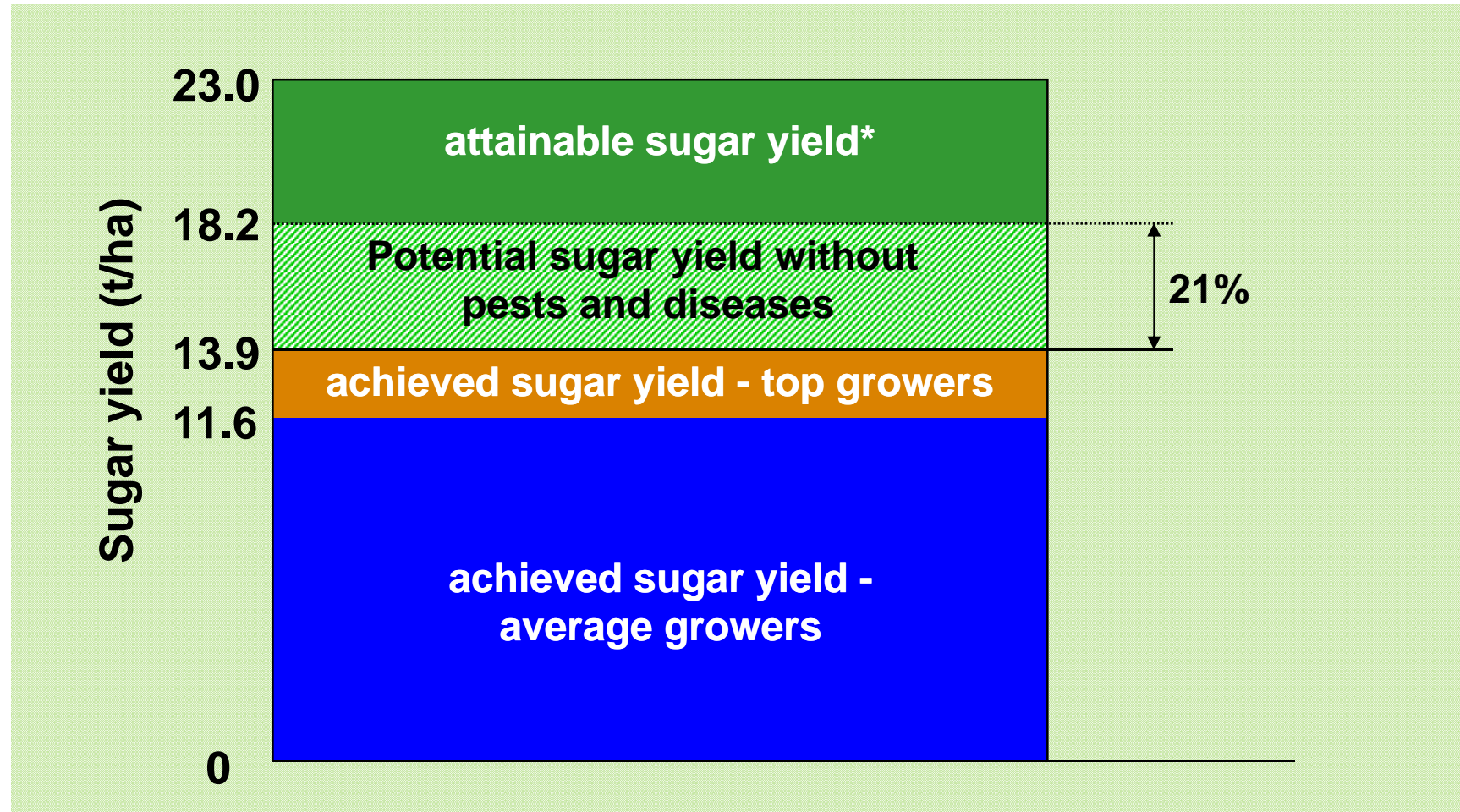
**75%** of variance in sugar yield explained by:  
***H. betae*, fungicide applications, aphanomyces,  
and sowing date**

Data SUSY 2006-2007





# Sugar yield loss due to pests and diseases



\* De Wit, 1953

# Monitoring

- ▶ for the use of damage thresholds monitoring is important
- ▶ sometimes confusing symptoms!

# Diagnostic service IRS

- ▶ free service for all sugar beet growers in NL
- ▶ samples sent in by advisors, agricultural department of the sugar industry, crop specialists
- ▶ 285 samples a year – 3.6% diagnosis ‘unknown’

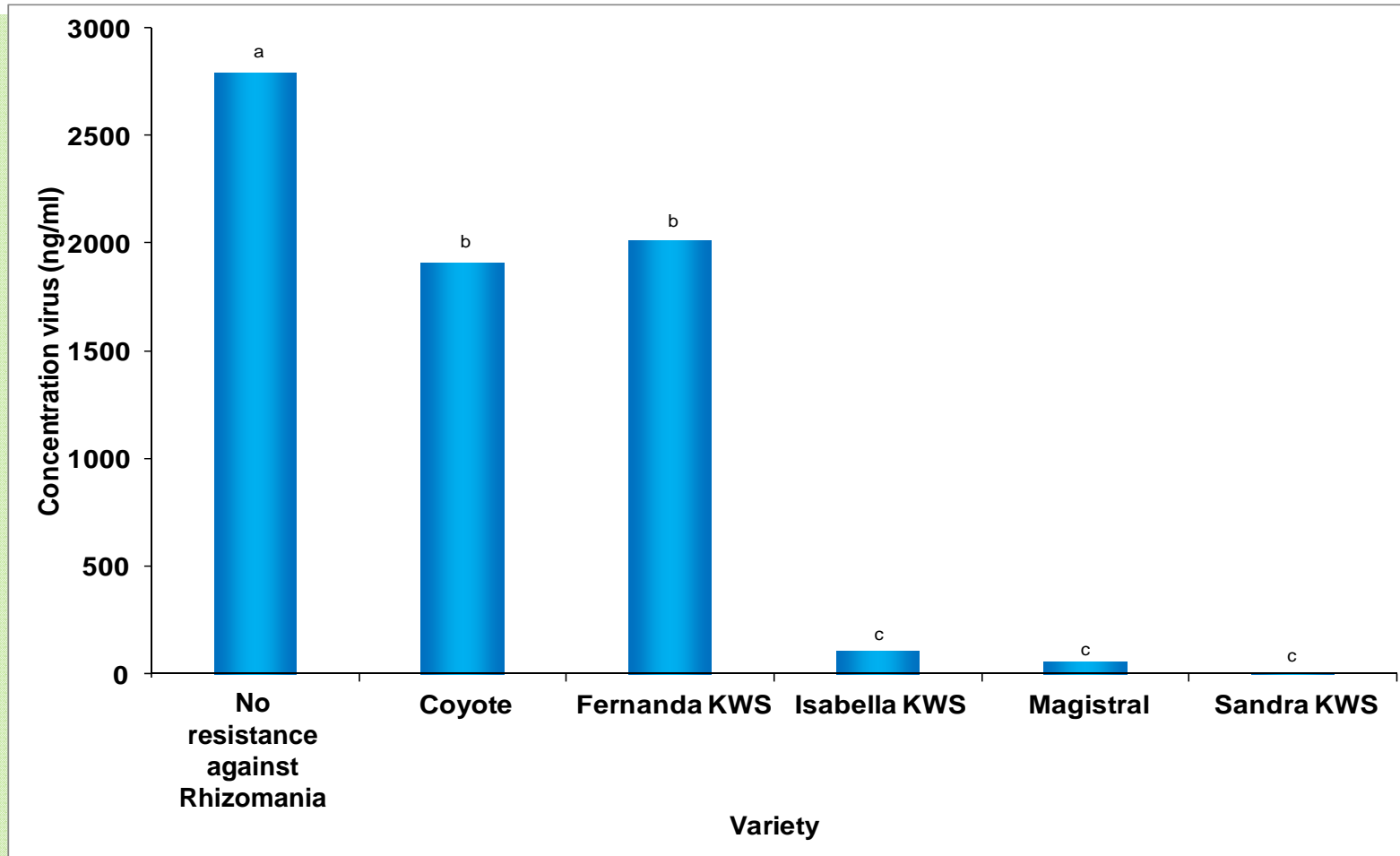


# Advantages of Diagnostic service

- ▶ proper diagnosis
- ▶ spread
- ▶ importance
- ▶ resistance breaking
- ▶ new causes
- ▶ trial field locations



# Resistance breaking



Bornemann *et al*, in press



# New causes

- ▶ Stemphylium cause of yellow leafspot
- ▶ first report in 2007
- ▶ proof of causal agent in 2011



Hanse *et al*, in press



# Conclusions

- ▶ pests and diseases are major cause of sugar yield differences
- ▶ proper diagnosis is important for sustainable crop protection
- ▶ monitoring is important for sustainable crop protection