Modelling plant diseases impact with the Belgian Crop Growth Monitoring System

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ESA meeting - Montpellier

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Plan of the presentation

- Introduction
- Objectives
- Materials and methods
- Results
- Integration of a « disease module » into B-CGMS : calibration & validation
- Conclusions

Introduction

• B-CGMS : an integrated in
reliable, timely and objective est

No integration of the effects of

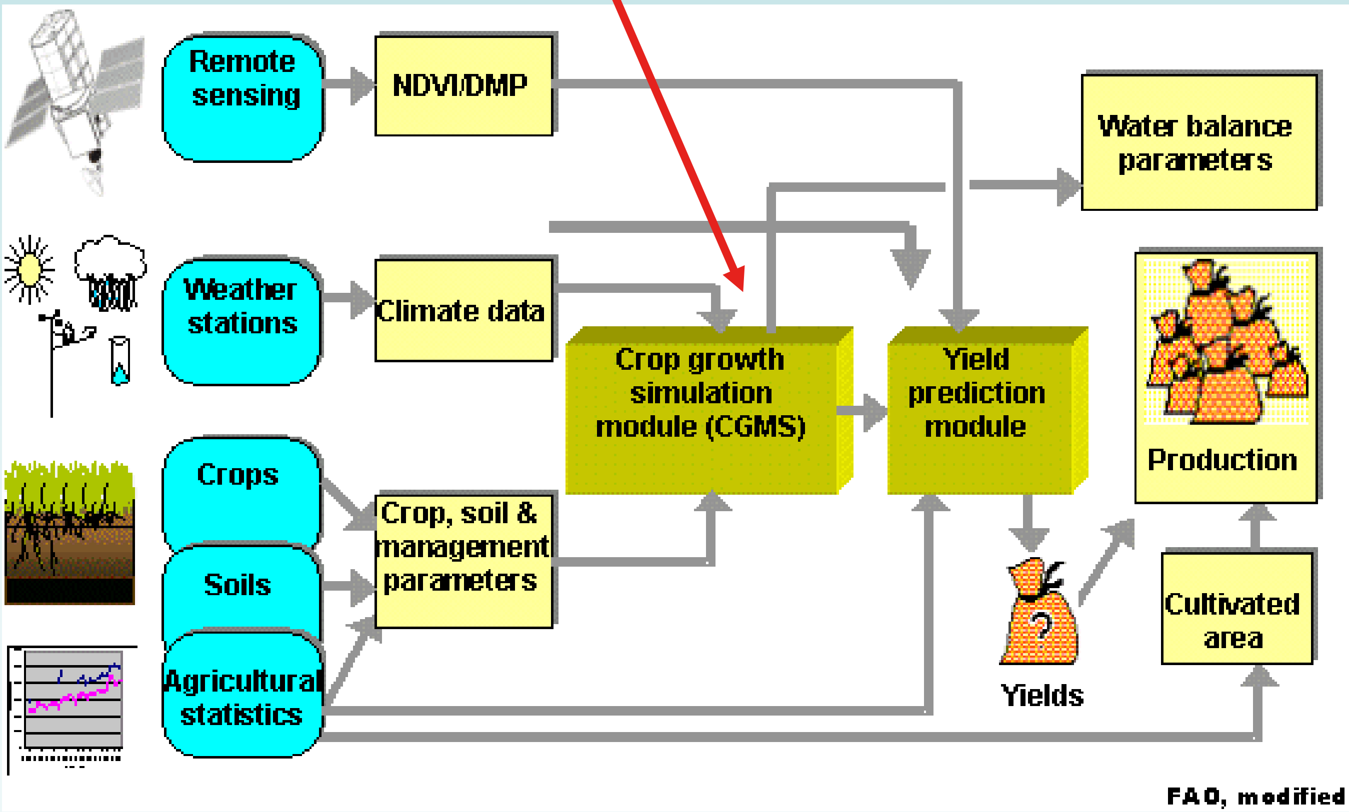
Septoria tritici → major cause of yield los

• Effects of contrasting diseases
be related to effects on **gre**
absorption of photosynthetically
green tissues (Waggoner & Berg

• The yield of wheat is partic
duration between ear emerg
1966)

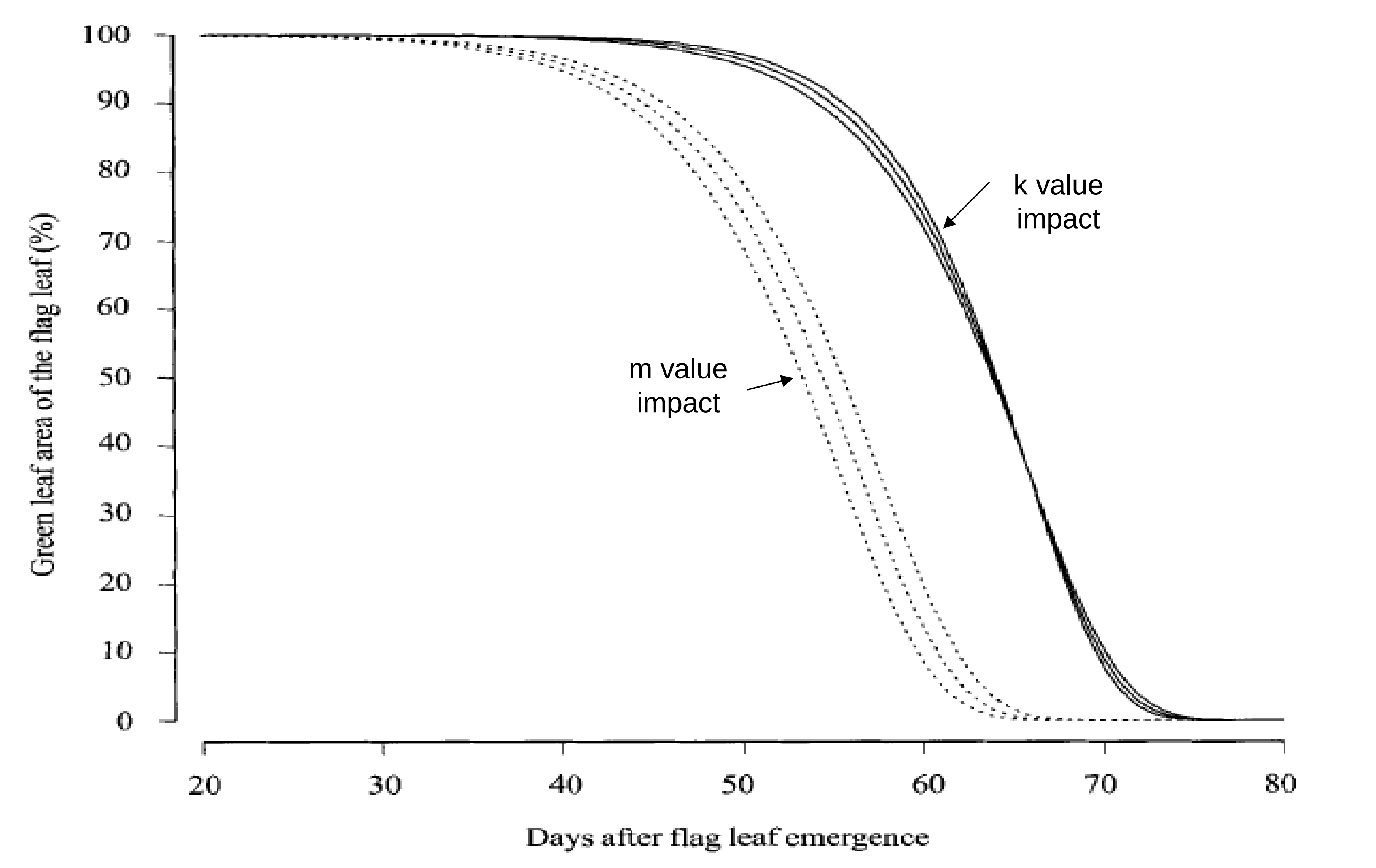
Objectives

to develop and to introduce a « diseases module » into B-CGMS

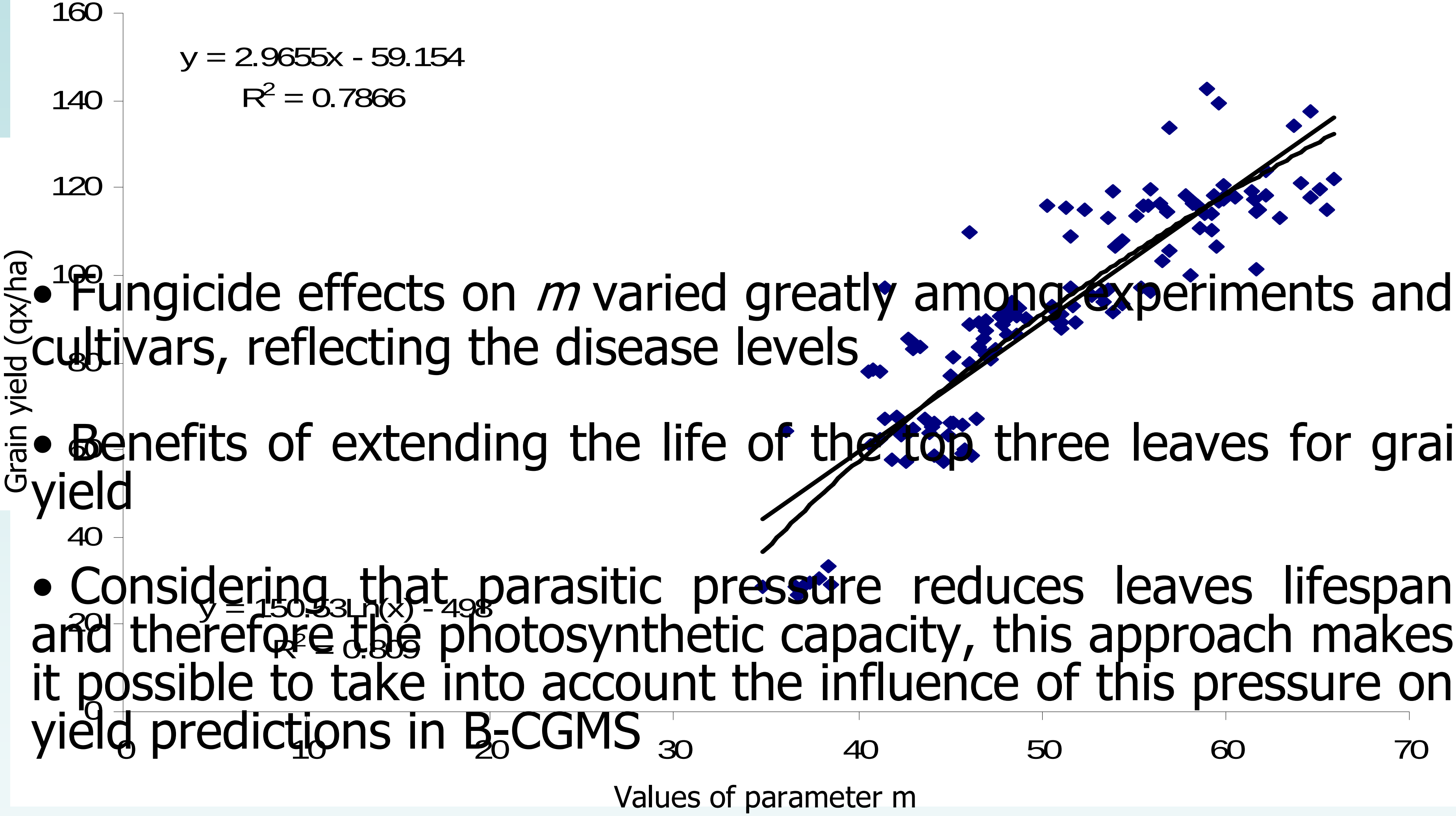


Materials and methods : the data

Material and method : the model



Results

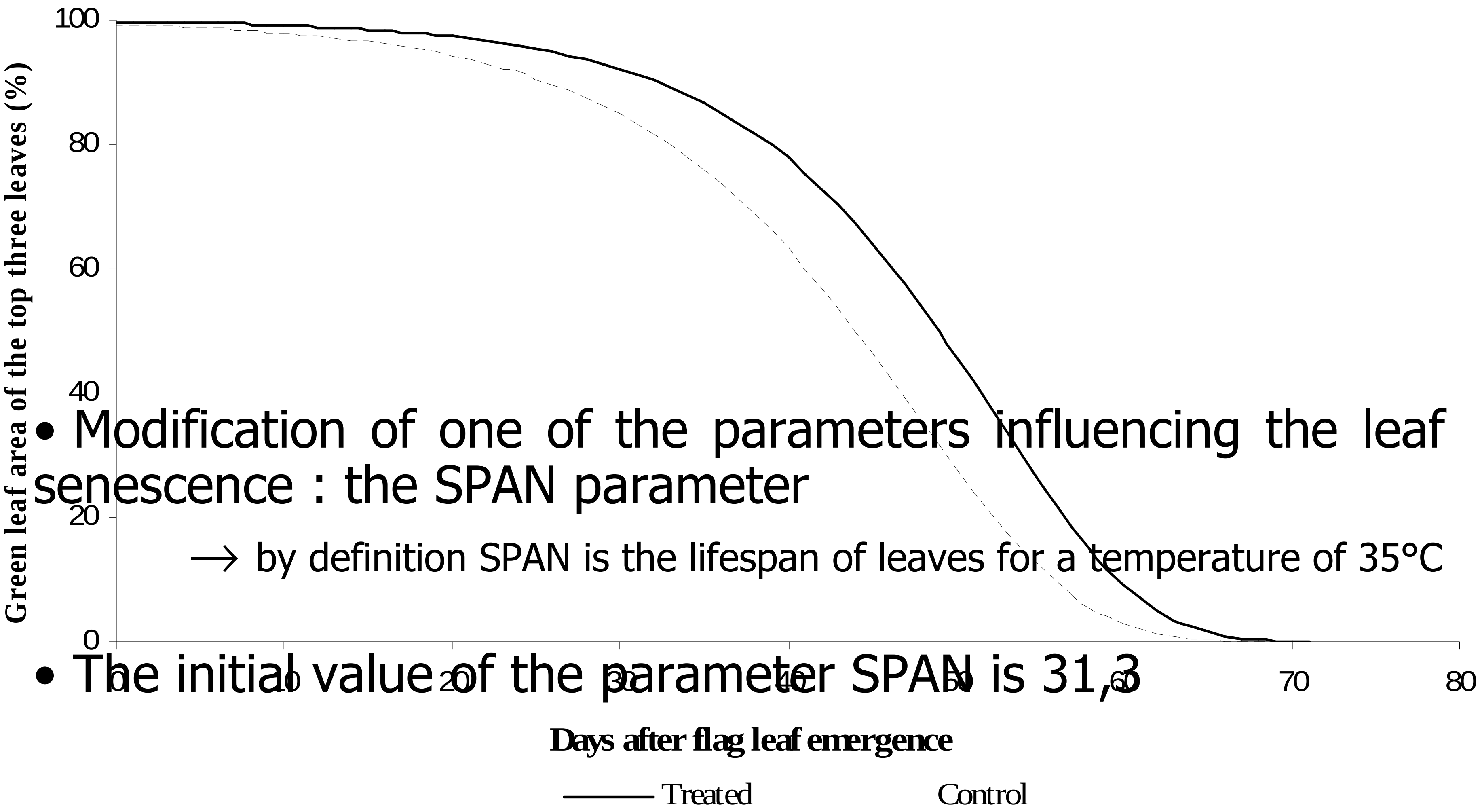


- Fungicide effects on *m* varied greatly among experiments and cultivars, reflecting the disease levels

- Benefits of extending the life of the top three leaves for grain yield

- Considering that parasitic pressure reduces leaves lifespan and therefore the photosynthetic capacity, this approach makes it possible to take into account the influence of this pressure on yield predictions in B-CGMS

Integration of a « diseases module » into B - CGMS : How?

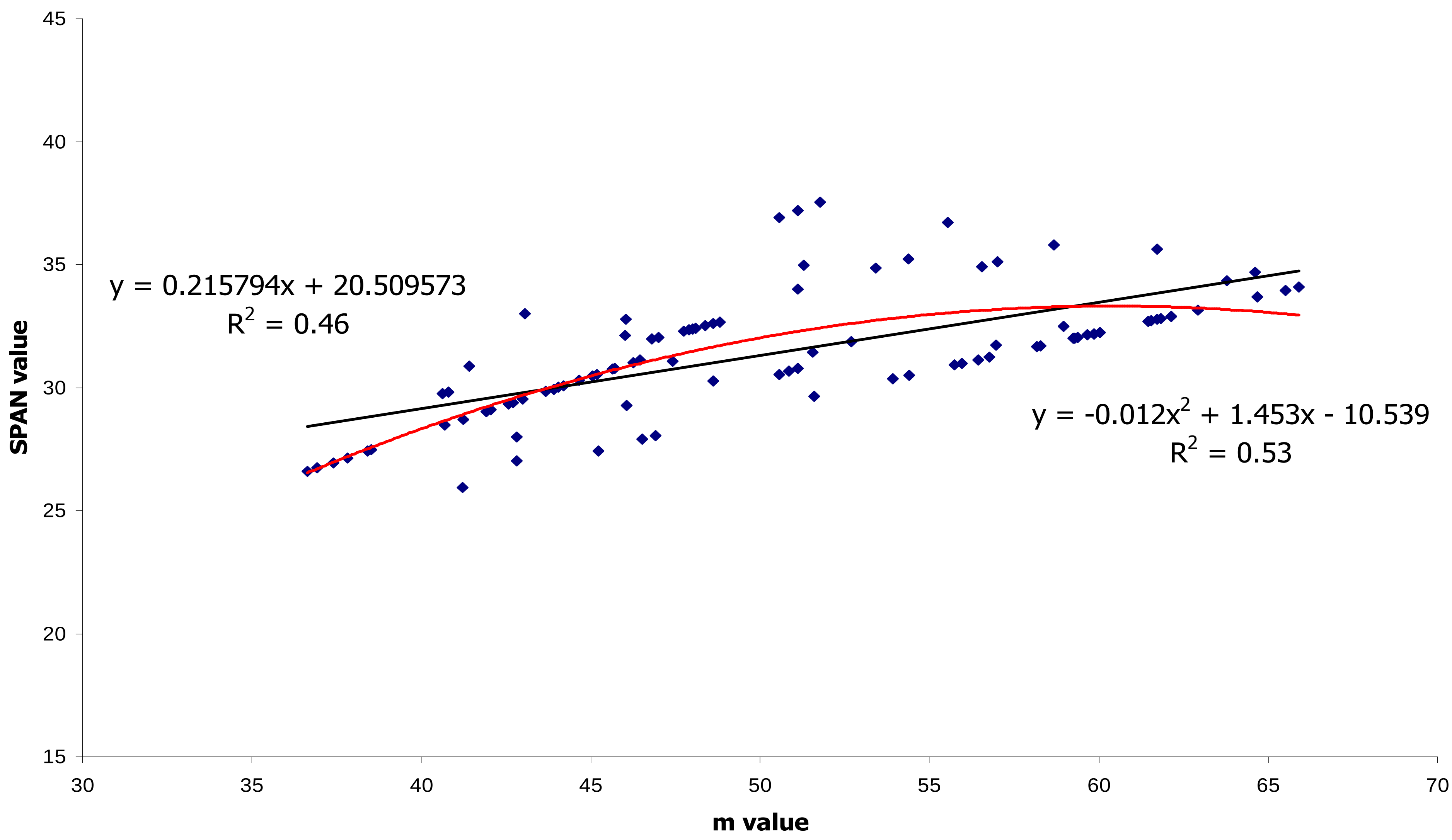


• Modification of one of the parameters influencing the leaf senescence : the SPAN parameter

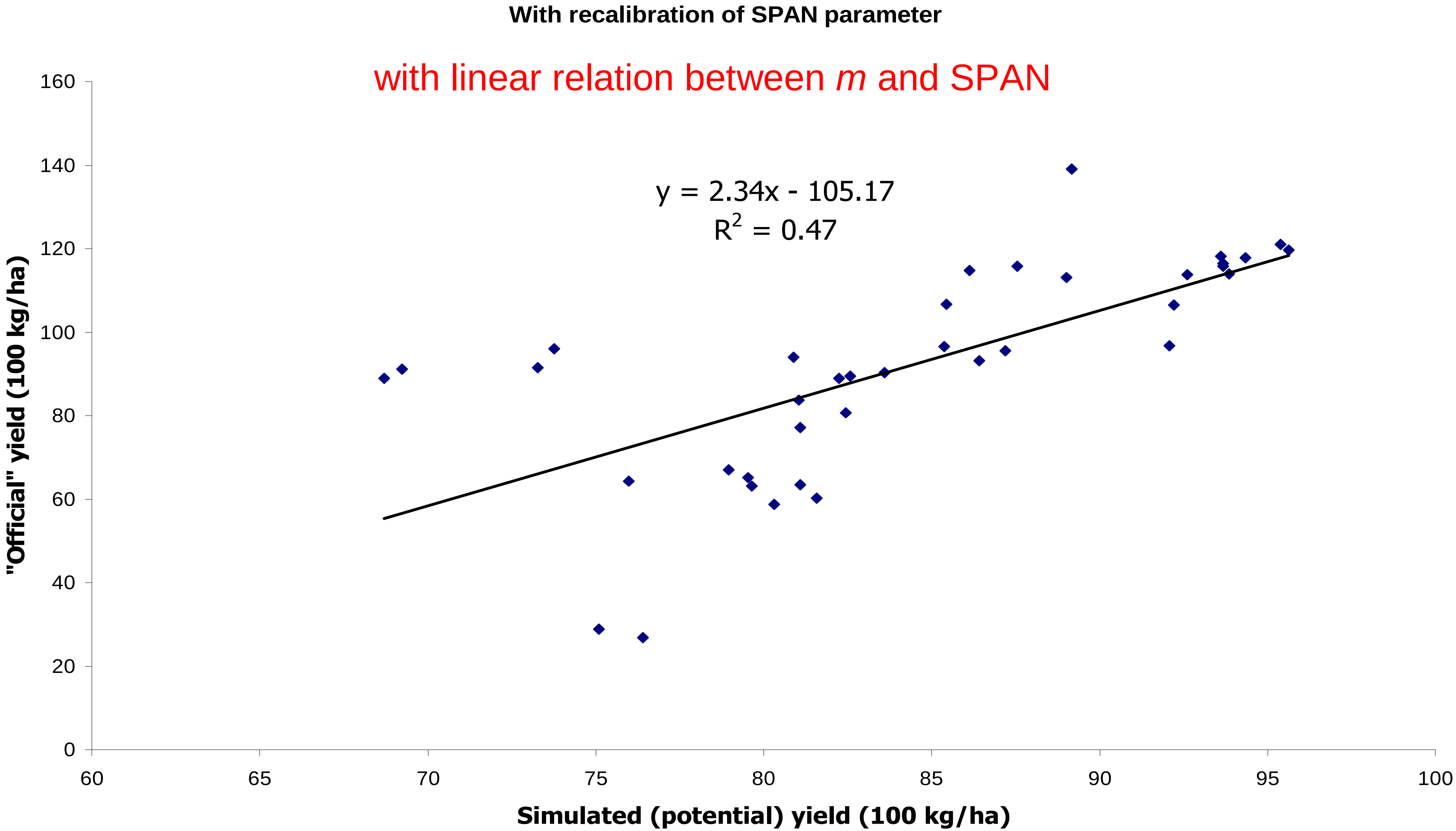
→ by definition SPAN is the lifespan of leaves for a temperature of 35°C

• The initial value of the parameter SPAN is 31,3

Integration of a « disease module » into B - CGMS : calibration



Integration of a « disease module » into B - CGMS : validation

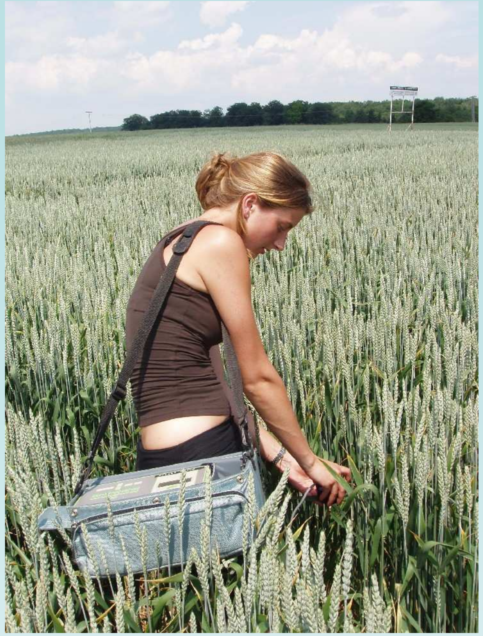


Conclusions

- Substantial improvement of yield assessments : R^2 from 0.11 to 0.57

- These results confirm the benefits of extending the life of the top three leaves for grain yield

- For a pratical use : estimation for each grid or for a group of grids of the parameter *m* based on fields observations (network of observations)



Thank you for your attention

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