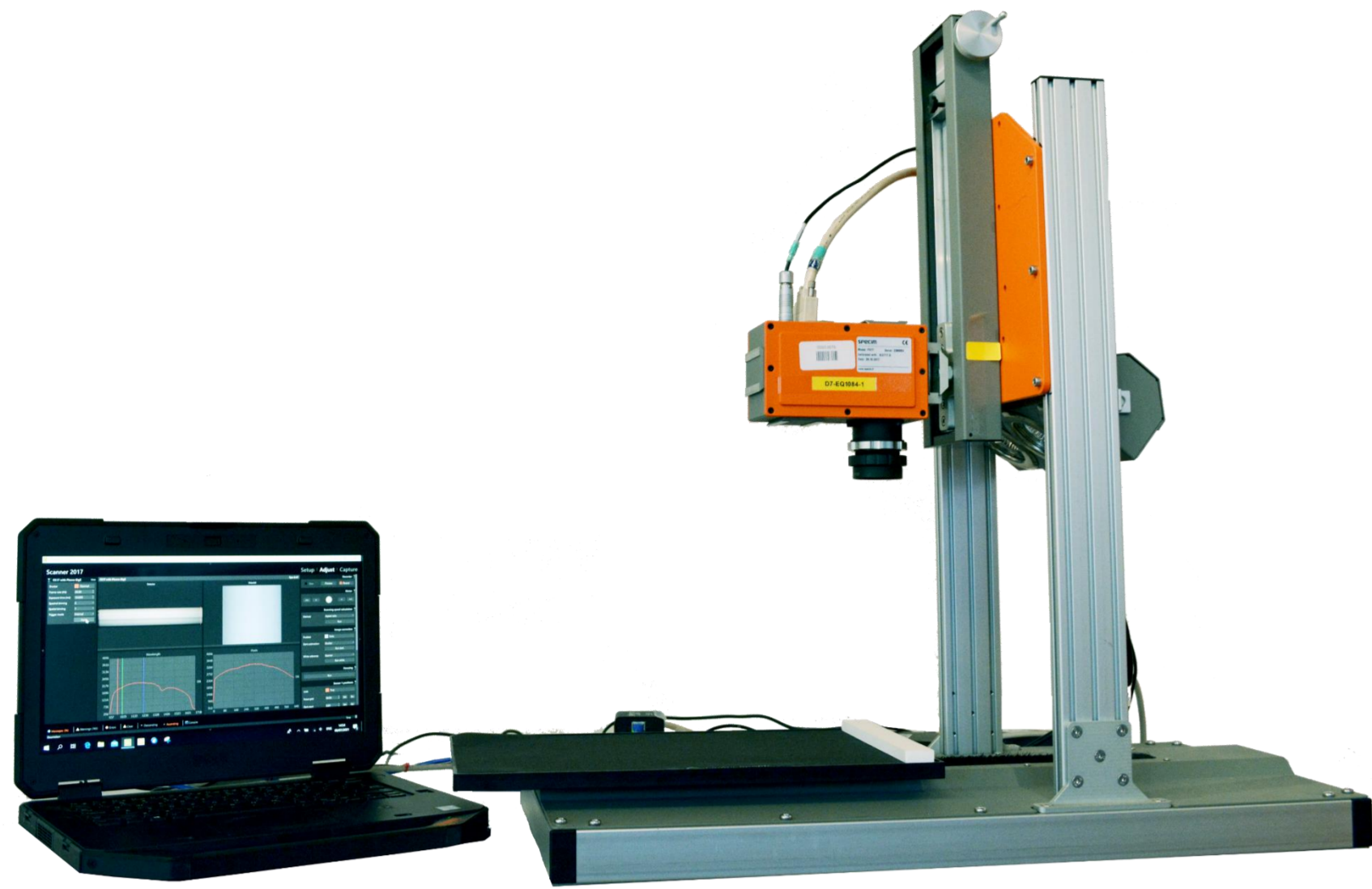


# Near infrared imaging for the health status of cereals

Damien Vincke, Corentin Demoitié, Damien Eylenbosch, Guillaume Jacquemin, Nicaise Kayoka Mukendi, Lisa Plasman, Benoît Scaut, Athina Rega, Damien Malice, Benoît Mercatoris (ULiège), Vincent Baeten, Philippe Vermeulen

Contact: [d.vincke@cra.wallonie.be](mailto:d.vincke@cra.wallonie.be)

## From the laboratory to the field



Analyses at the laboratory ...



... in experimental plots ...



... and in the field

## Disease detection

Evaluation of a fungal disease: Fusarium Head Blight (FHB)



Varietal trial at CRA-W



Sample collection



Laboratory analyses & Data treatment

“Machine Learning” Algorithms

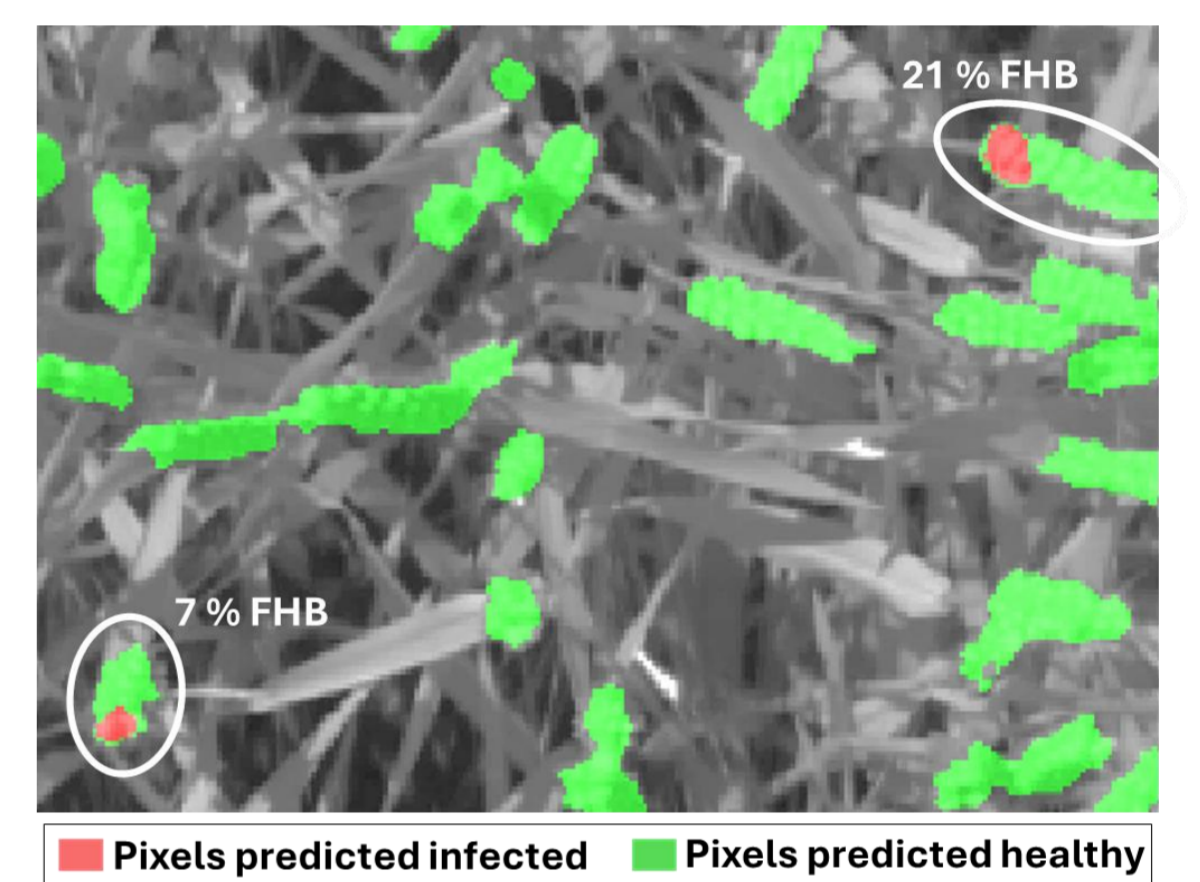


Analysis results



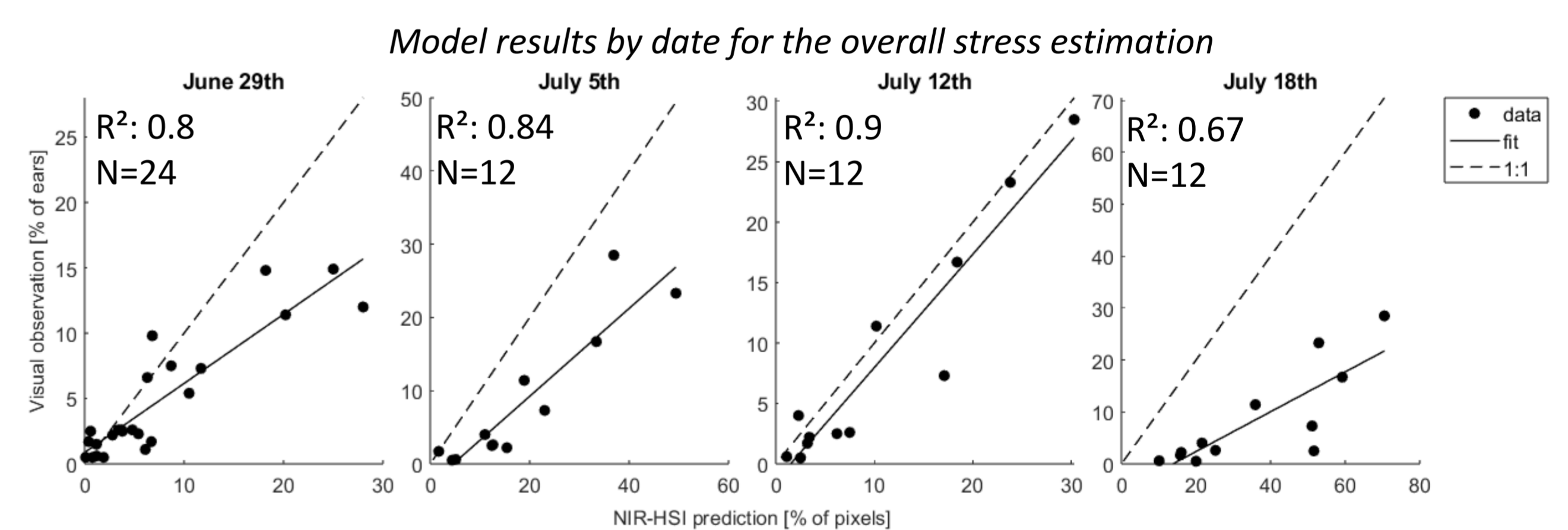
Healthy Infected

Deployment in the field



Pixels predicted infected Pixels predicted healthy

Measure date	Model date	FHB		Take-all		Overall stress	
		RMSE	R <sup>2</sup>	RMSE	R <sup>2</sup>	RMSE	R <sup>2</sup>
June 29 <sup>th</sup>	June 28 <sup>th</sup>	0.7	0.10	3.7	0.43	2.1	0.80
July 5 <sup>th</sup>	July 4 <sup>th</sup>	0.5	0.24	6.2	0.61	4.0	0.84
July 12 <sup>th</sup>	July 14 <sup>th</sup>	0.5	0.35	7.4	0.46	3.1	0.90
July 18 <sup>th</sup>	July 14 <sup>th</sup>	0.4	0.51	7.3	0.48	5.8	0.67



The method allows estimating the general health status of the ears in experimental plots. However, it does not allow differentiating FHB from take-all (*Gaeumannomyces graminis tritici*). The current method remains a research tool and is not yet transferable for varietal evaluation in routine experiments. Improvements are required to speed-up data acquisition and processing as well as coping with variations in environmental conditions (light, wind, humidity).

## Related projects:

	<b>PhenWheat</b>	<b>PHENWHEAT 2018-2024</b>	Caractérisation de la dynamique de croissance de variétés de froment d'hiver résistantes à différents stress biotiques et abiotiques au moyen d'une plateforme de phénotypage par proxidétecton
		<b>INVITE 2019-2024</b>	INnovations in plant Variety Testing in Europe
		<b>PHENET 2023-2027</b>	Tools and methods for extended plant PHENotyping and EnviroTyping services of European Research Infrastructures