

Variability of Leaf Surface Temperatures on a Sunny Day in August 2008 in the Model Ecosystem Experiment “Querco”

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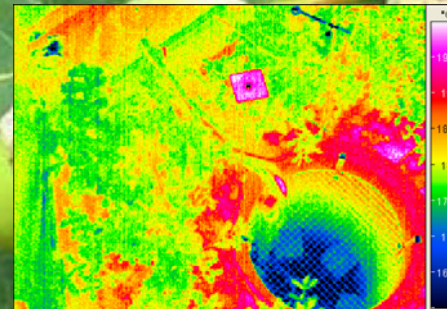
Outline



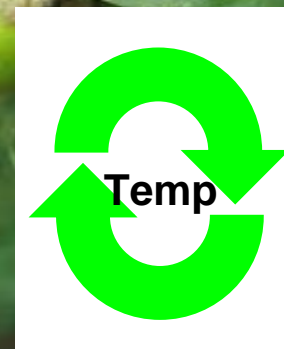
Method



Results



Conclusions



Method: Measurement System



Infrared Thermography



VarioCAM



Lenses

Lens	Focal distance (mm)	min. focus (m)	FOV (°)
Wide angle lens	12.5	0.2	(64 x 50)
Standard lens	25	0.5	(32 x 25)
Telephoto lens	50	2.0	(16 x 12)

Spectral range 4.....14 μm
 Temp. resolution 0.08 K
 Accuracy 2 K

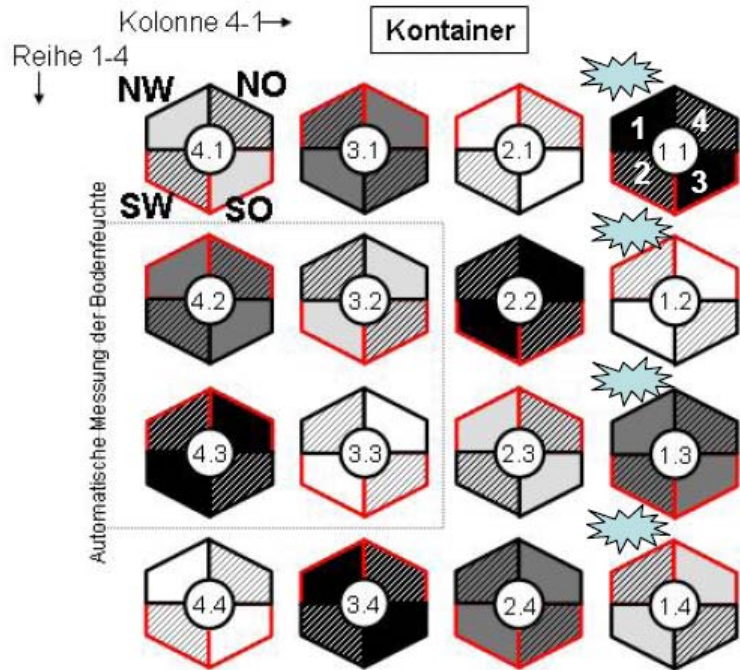
Method: Parameter



Surface Temperature



Querco: Design Modellökosysteme



Beginn der Aufnahmen bei Kammer 1.1.;
Ende bei Kammer 4.1.

Reihenfolge der Aufnahmen 1-4



Aufnahmestandort

- Kontrolle
- Trockenheit
- Lufterwärmung
- Kombination

opportunistischer Pathogen



kalkhaltiger (pH 7.5)
Waldboden, Fluvisol,
Brugg

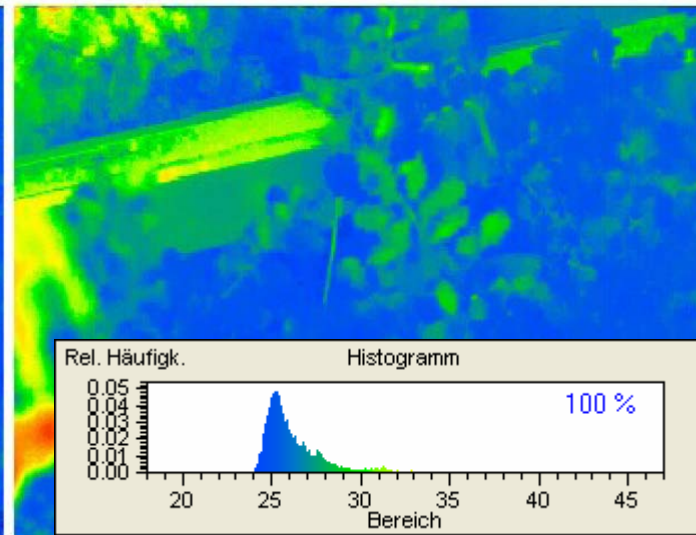
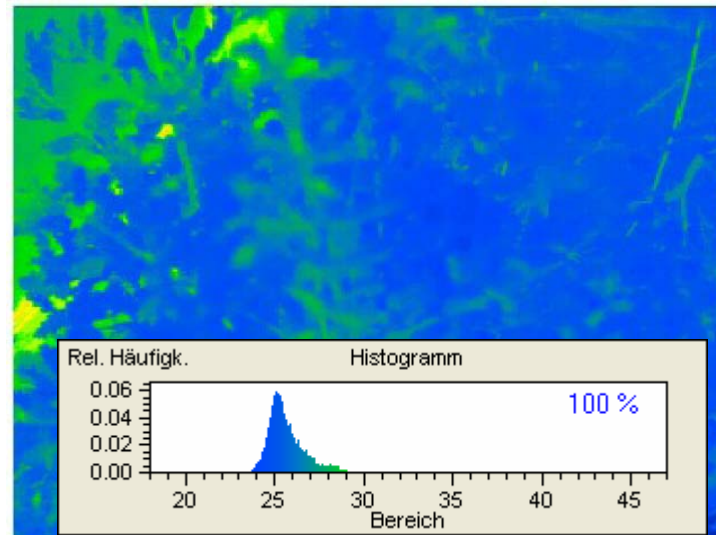
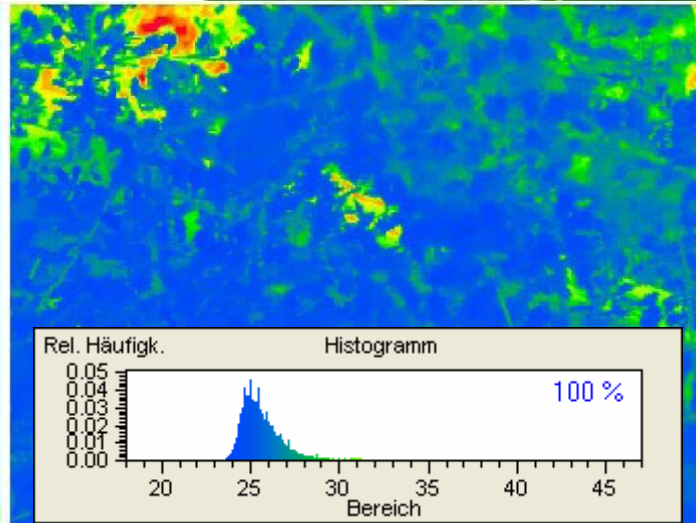
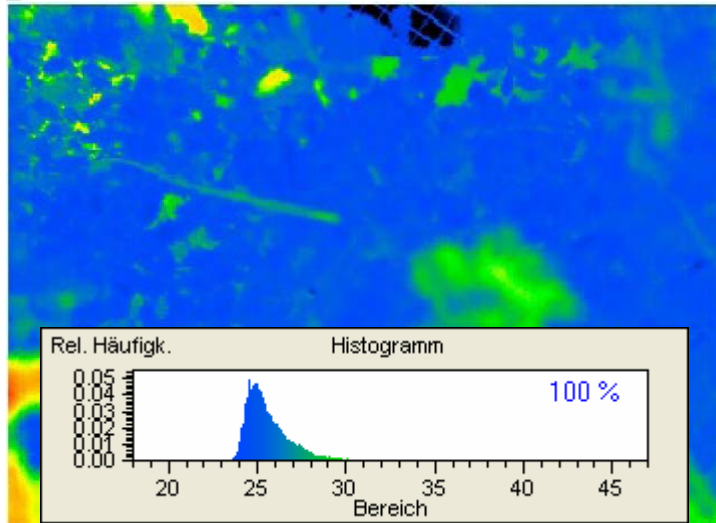
saurer (pH 4.5)
Waldboden, Alisol,
Eiken



Leaf Surface Temperatures August 06, 2008; 15:00 CEST



Chamber 1.2: Control

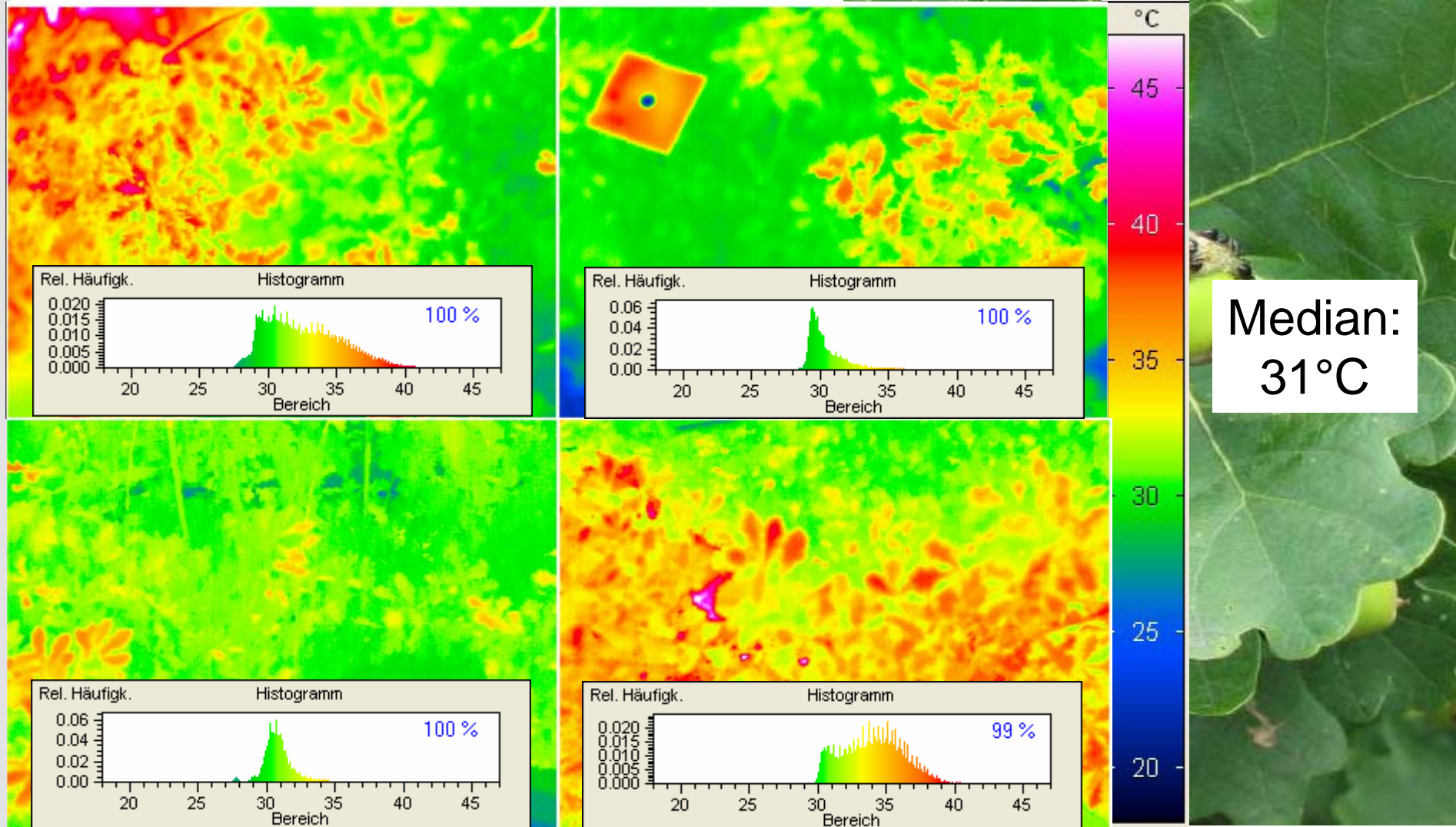


Median:
25°C

Leaf Surface Temperatures August 06, 2008; 15:35 CEST



Chamber 4.1: Combination



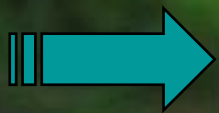
Results: Summary

Leaf surface temperatures and its variability in the control and treatment plots (n=4) of the *Quercus* experiment on August 6, 2008, 15:00 to 15:35 CEST. The analysis was performed using 20 sun leaves and shadow leaves, respectively, in each chamber.

Treatment	,Combination'	,Control'	,Warming'	,Drought'
Temperature/°C	34,0 + 2,68	27,3 + 1,90	28,0 + 1,99	32,3 + 2,54

Conclusions

- Highly resolution thermography elucidates high variability of leaf surface temperature even within one chamber with a maximum span of 12 °C.
- On sunny days in summer leaf temperature may amount to a mean value in the comb. Temp./soil drought plot to 34 °C.
- At the same time leaf temperatures in the control chamber are near the outside air temperature of 27 °C.
- At that day soil drought is the most important factor leading to high leaf surface temperatures accounting for a about 5 °C increase in leaf temperature as compared to the control.



further detailed data evaluation will likely elucidate also impacts of soil type and pathogene treatment on leaf temperatures

Thank You!!

for your kind support
and for giving us the
opportunity being part of
this great integrated and
interdisciplinary project

