WINTER WHEAT AND SUMMER SHADE

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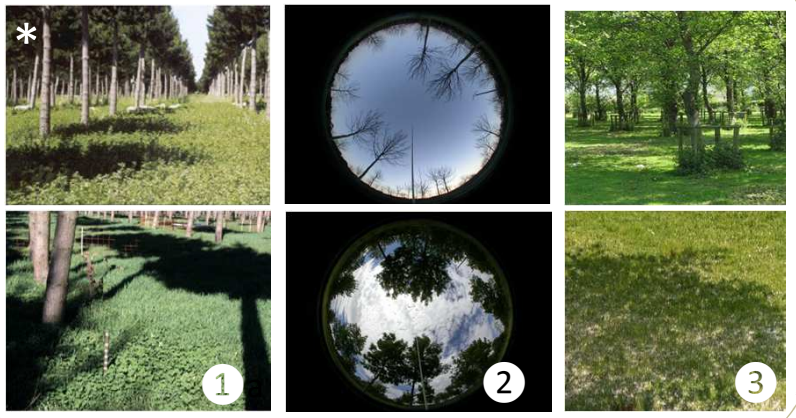
AGROFORESTRY IN BELGIUM SOIL AND CLIMAT CONTEXT

Hypothesis Light is the principal competed resource between tree/crop in agroforestry
Constraint Only young agroforestry plot (1-7 years old)
Objective Evaluate the effect of light reduction on winter wheat growth and productivity

LIGHT ENVIRONMENT UNDER TREES

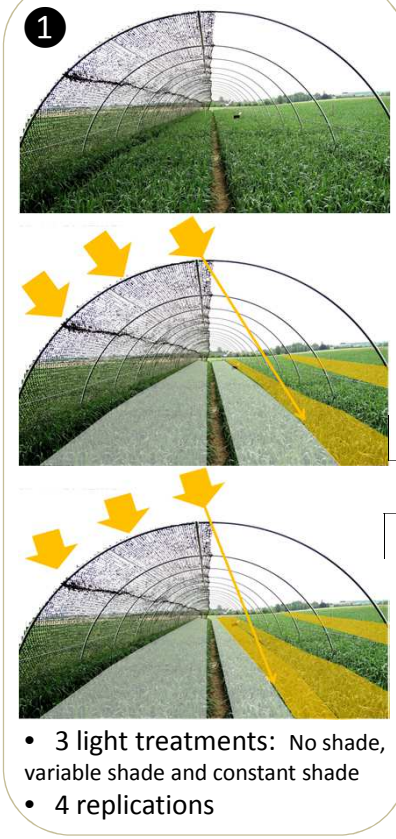


HOW TO SIMULATE AGROFORESTRY SHADE ?

1. Spatial variability
2. Temporal variability and shade intensification
3. Direct and diffuse light transmission

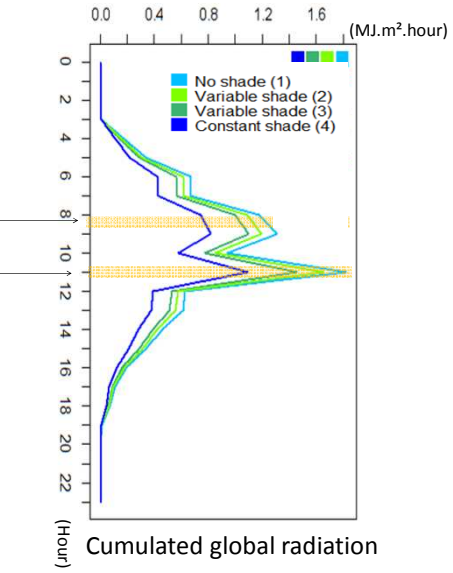
To mimic: winter wheat & hybrid walnut agroforestry

ARTIFICIAL SHADE TREATMENT



- 3 light treatments: No shade, variable shade and constant shade
- 4 replications

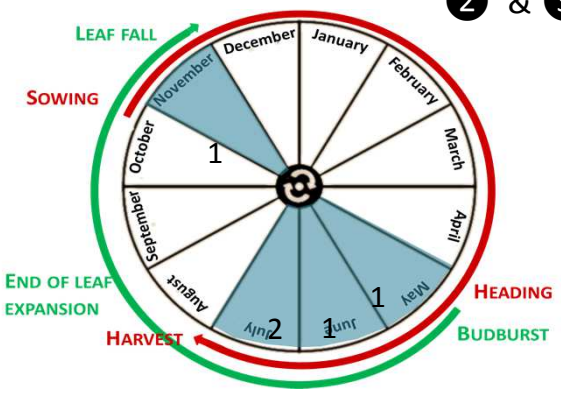
Sensors' position



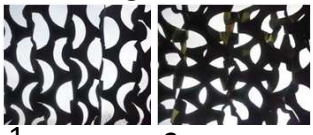
Cumulated global radiation

Installation of shade layers during **wheat** and **walnut** cross-phenological period

2 & 3



Camouflage net



Intensification of shade from budburst to the end of leaf expansion

HOW DOES WINTER-WHEAT GROW UNDER SHADE ?

Measured variables	Period
❖ Biomass	→ 5 times before harvest
❖ LAI (leaf area index)	
❖ Yield components	→ Harvest time
❖ PAR (photosynthetic active radiation)	→ All growing season

Shade impact on
Comparison between treatements

- ❖ Crop yield
- ❖ Grain quality
- ❖ Light use efficiency
- ❖ Partitioning of the dry matter

* Varella et al.,2011. Do light and alfalfa responses to cloth and slatted shade represent those measured under an agroforestry systems.