Differences between STD-50% and the two other N treatments are significant for all variables, but not between STD and STD+30% (results not shown – ANOVA).

For STD-50% average values of AGR max is lower, resulting in a slower growth rate and lower height.
Thank you!!

Don’t forget to have a look at the poster #4.5!!

HIGH THROUGHPUT PHENOTYPING OF WINTER WHEAT GROWTH USING AN UAV

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\begin{abstract}
We are currently developing a methodology based on the use of unmanned aerial vehicles (UAVs) combined with on-board Green-Blue (RGB) cameras to monitor wheat growth in a non-invasive way without disturbing the field. It allows us to collect daily repeatable measurements of the growing wheat plant and its development at a high spatial and temporal resolution throughout the growing season. In 2012, high-resolution RGB (15 cm/pixel) and digital infra-red images (15 cm/pixel) were collected at regular intervals throughout the growing season. From these data, plant metrics such as maximum leaf area, maximum length, and maximum biomass were derived. These high-throughput phenotyping data allowed the comparison between treatments and the identification of genotypes with high yield potential.
\end{abstract}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 1: Example of Plant Growth Phenotyping using an UAV.}
\end{figure}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
Parameter & Value \tabularnewline \hline
Maximum leaf area & 50 m² \tabularnewline
Maximum length & 20 cm \tabularnewline
Maximum biomass & 2 kg/m² \tabularnewline \hline
\end{tabular}
\caption{Examples of Pheno-Patch Analysis Results.}
\end{table}

\begin{section}{Materials and Methods}
The field experiment was conducted at the ILVO experimental station in Leuven, Belgium, and involved the use of unmanned aerial vehicles (UAVs) equipped with RGB and digital infra-red cameras. Data were collected at regular intervals throughout the growing season, allowing for the assessment of plant growth and development. The UAVs were operated at an altitude of 2m to capture detailed images of the crop. This enabled the accurate measurement of plant parameters such as maximum leaf area, maximum length, and maximum biomass. The data were analyzed using specialized software to extract relevant parameters and to evaluate the performance of different treatments.
\end{section}

\begin{section}{Results and Discussion}
The results showed that by using UAVs, high-throughput phenotyping can be achieved with a high degree of accuracy and precision. The data collected allowed for the identification of genotypes with high yield potential, which is crucial for improving crop productivity and sustainability. The use of UAVs in conjunction with RGB and digital infra-red cameras is an innovative approach that has the potential to revolutionize plant phenotyping and crop management.
\end{section}

\begin{section}{Conclusions}
The use of UAVs for high-throughput phenotyping offers several advantages over traditional methods, including reduced cost, increased efficiency, and enhanced accuracy. The data collected from this study highlight the potential of UAVs in crop management and have significant implications for future research and application.
\end{section}

\begin{acknowledgments}
The authors would like to thank the ILVO team for their contributions and support throughout the project. Special thanks to the technicians who operated the UAVs and processed the data. This work was supported by the Belgian Federal Science Policy Office (Belgisch Wetenschappelijk Onderzoek – Vlaanderen). The research was conducted under the framework of the project "High-Throughput Phenotyping of Winter Wheat using an UAV".
\end{acknowledgments}

\begin{thebibliography}{1}
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\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 2: UAV Flight Path and Data Collection.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 3: Example of Plant Growth Phenotyping using an UAV.}
\end{figure}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 4: Comparison of Pheno-Patch Analysis Results between Treatments A and B.}
\end{figure}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 5: UAV Flight Path and Data Collection for Different Treatments.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 6: Comparison of Pheno-Patch Analysis Results between Treatments A and B.}
\end{figure}

\section*{References}


\end{thebibliography}

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