



Tropentag, September 11-13, 2024, hybrid conference

“Exploring opportunities ...
for managing natural resources and a better life for all”

The ongoing journey of intercropping modelling: Key insights from the model developers and expert users on fundamental assumptions

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Abstract

Crop modelling and simulation have become increasingly important tools in predicting the future climate change on crop production and exploring new agronomic management strategies/cropping systems to enhance resilience to climate change. However, the reliability of these models critically depends on how well the fundamental assumptions and concepts of the model are represented. The significant variability in model results observed in previous multi-model comparisons of monoculture systems is mostly due to a strong mismatch between models in terms of their assumptions. This leads to discrepancies in model outputs, even when they are run under the same conditions of climate, soil, and management practices.

Additionally, the complexities of intercropping systems regarding light, water, and nutrient sharing concepts cannot be compared to monoculture systems. Since models have varying levels of accuracy in the representation of fundamental processes for resource sharing concepts, and intercropping is a very complex system, we aim to examine how the existing models represent intercropping systems in their entirety, including their assumptions, concepts, equations, and parameters. Most of these assumptions are rarely explicitly

described in scientific publications, and sometimes they are not immediately apparent in the model documentation from model developers and experts users perspective.

This poster will provide detailed description of intercropping models routines, scale of application in time and space and unbiased insight into the key strengths and weaknesses of the existing models in terms of intercropping capabilities. In addition, the poster will highlight areas that may need further improvement regarding intercropping modelling for above-ground and below-ground resource sharing.

Keywords: Comparing models assumptions, intercropping routines, model structures