

**Session Biosphere: April 12th 11.30 hrs**

**1s3 The contribution of biodiversity to productivity in circular agriculture**

## **PLANT DIVERSITY OF STRIP CROPPING SYSTEMS ENHANCES AERIAL ARTHROPOD DIVERSITY**

CUPERUS F 1,2), OZINGA W 3), BIANCHI F 1), ROSSING W 1), CROIJMANS L 4),  
APELDOORN van D 1,2)

1) Farming Systems Ecology, Wageningen University & Research, P.O. Box 430, 6700 AK Wageningen, The Netherlands,

2) Wageningen Plant Research, Wageningen University & Research, Edelhertweg 10, 8200 AK Lelystad, The Netherlands,

3) Wageningen Environmental Research, Wageningen University & Research, P.O. Box 430, 6700 AK Wageningen, The Netherlands,

4) Department of Entomology, Wageningen University & Research, P.O. Box 430, 6700 AK Wageningen, The Netherlands

---

A long-pursued strategy to support biodiversity in agricultural landscapes is the conservation and increase of semi-natural habitat at farm and landscape level. Additional measures directed at the managed crop habitat within agricultural fields might be a valuable supplementary strategy to support farmland biodiversity.

There is mounting scientific evidence that spatial crop heterogeneity can support and restore biodiversity in agricultural landscapes (Siramí et al., 2019). A form of practically implementing crop heterogeneity is strip (inter)cropping. Strip cropping refers to the practice in which crops are grown in multi-row strips in an alternating pattern of at least two crops (Ditzler et al., 2021). Strip widths may be based on available machinery to establish a diverse crop mosaic on a small scale. Implementing strip cropping is expected to create continuity of habitat in time and space with an enhanced diversity of food, nesting sites, shelter and dispersal routes. For many species this may offer better conditions to find feed, food and shelter, potentially resulting in higher reproduction levels and lower mortality rates after disturbances in neighbouring strips.

We measured effects of strip cropping on aerial arthropod communities in an organic strip cropping experiment in Lelystad, the Netherlands. The experiment consisted of two strip cropping configurations and large scale references of each crop. The strip cropping configurations comprised alternating 3m wide strips with multiple rows of a single cultivar of a) wheat and cabbage, and b) wheat and cabbage as in a) but with wheat intersown with faba bean in an additive design. Aerial arthropods and plant communities were sampled using sweep netting and transect walks in two rounds.

Our findings suggest that strip cropping resulted in an increase in aerial arthropod species diversity. Cabbage strips, alternated with wheat strips, supported greater arthropod species diversity than found in cabbage grown in large scale monocultural fields. Furthermore, we found that intercropping wheat with faba bean led to additional arthropod species diversity compared to strip cropped wheat. When properly designed and managed, simple measures such as strip cropping cabbage with wheat and intercropping legumes in cereals can contribute to supporting arthropod communities in agricultural landscapes.

Ditzler et al. 2021. Eur. J. Agron. 122, 126197

Sirami et al. 2019. PNAS 116, 16442-16447

---

*Keywords: Arthropods, intercropping, strip cropping, crop heterogeneity*