The effect of catch crops on the yield of subsequent main crops

Robin Kümmerer, Bernhard Bauer
Institute for Biomass Research
University of Applied Sciences Weihenstephan-Triesdorf
Markgrafenstraße 16, 91746 Weidenbach
in collaboration with the CATCHY consortium

Possible yield factors influenced by catch crops

Nutrient balance
Nutrient pool
N-fixation
P-mobilisation
Humus balance

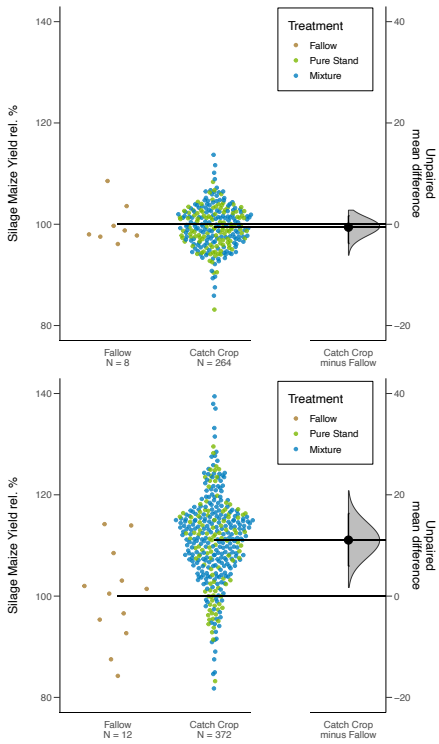
Phytopathogenic Potential
Fungi
Insect pests
Nematodes
Viruses

Soil structure
Rooting
Aggregate stability
Pore Volume
Bulk density
Air and water balance

Biochemical Processes
Allelopathy
Root exudates
Soil microbiome

Water balance
Transpiration
Evaporation
Water storage capacity

Catch crops improve the yield of following crops under dry growing conditions



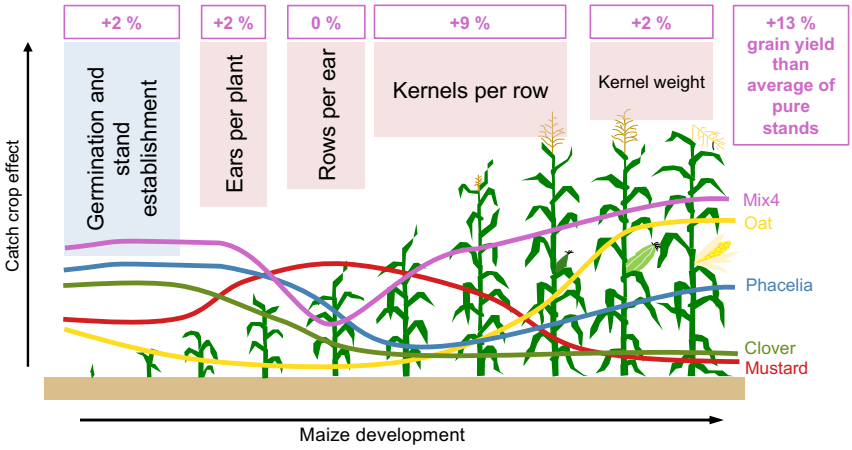
Water sufficient conditions
2017 & 2021; Triesdorf
Ø 423 mm precipitation Apr-Sep

No yield effect

Water limiting conditions
2018,2019,2020; Triesdorf
Ø 281 mm precipitation Apr-Sep

+ 11 % yield increase

Temporal pattern of catch crops effects on the yield formation of maize and their positive combination in a catch crop mixture



Conclusion

- Catch crops can increase the yield of subsequent main crops
- Yield losses due to inappropriate species or mixtures are also possible
- Especially in unfavorable growing conditions, catch crops can improve the yield of the main crops (drought)
- Plant species used as catch crops have individual, temporally variable effects on subsequent crops
- Catch crop mixtures can combine the positive yield effects of integrated species and increase yields compared to pure stands

→ The effect of intercropping on yield also depends on the species chosen and how they are combined in mixtures.

Project partners:
- Institute of Soil Science, Leibniz University Hannover, Hannover
- Molecular Plant Nutrition, Leibniz Institute of Plant Genetics and Crop Plant Research, Gatersleben
- Dept. Microbe-Plant Interactions, University of Bremen, Bremen
- Crop Production and Protection / Market Theory, University of Applied Science Weihenstephan-Triesdorf, Triesdorf
- Deutsche Saatveredelung AG, Lippstadt (DSV) – Breeding Station Hof Steimke

BONARES

GEFÖRDERT VOM Bundesministerium für Bildung und Forschung