

CROP DIVERSIFICATION AND ENVIRONMENTAL PROBLEMS IN THE DANUBE-TISZA INTERFLUVE REGION



DIVERFARMING

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Introduction

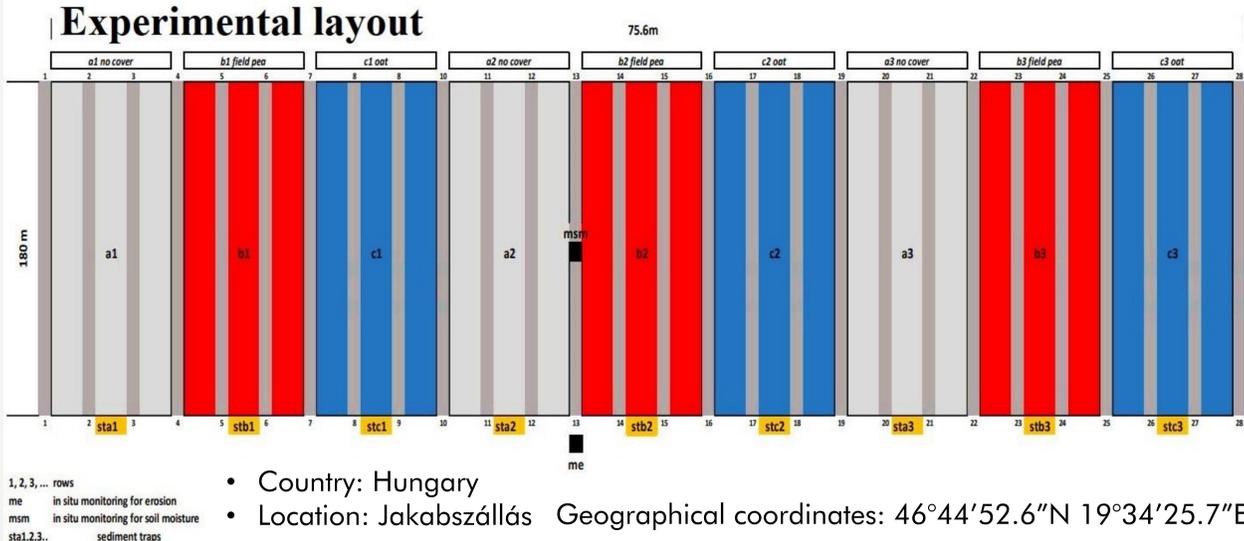
• The research focuses on environmental problems and low input practices in sandy and loess-covered areas of the Pannonian pedoclimatic region within the framework of the H2020 Diverfarming project. This poster presents the investigations of asparagus crop at Jakabszállás, Hungary, with wind erosion and drought hazard. The experimental plot of 1.3 ha with 28 rows of asparagus is located at Jakabszállás – Danube -Tisza Interfluve (Hungary). Currently 7–10 years of monocropping system is used for food production. Among the managing practices there is the foil coverage, the crop rotation, the mineral fertilizer and the integrated pest management. The main environmental problems which occur in this plot are the loss of biodiversity, the wind erosion, the lack of ground cover, the poor soil quality, the low soil organic matter content and the water scarcity.

Methods

• Plant control and sampling are performed for every harvest and crop. Crop (asparagus) samples from the central row will be sampled in each plot. Erosion measurements are made by in situ photogrammetric (event based) monitoring and sediment traps for wind deposited material at each inter row, mapping erosion features, using UAV.

Results

Experimental layout



• In sandy soil areas - against the deflation - geotextiles protect the crops, resulting in significant costs.

Greenhouse gas emission measures:

- CO₂ and N₂O, 25 measurement campaigns per year in the plots focusing on the growing season, in the harvest, the rotation and the manuring (April-July) period.
- In periods when rapid changes occur: using dynamic chambers.



Soil sampling:

- Time and frequency: every June during three crop cycles
- Soil depth: ploughed layer (0-10 and 10-30 cm) and one soil pit excavation at the beginning of the field experiment
- Number of samples: three composite samples per plot (nine samples per treatment)



Conclusion

- For diversification: we propose two alternatives:
 - D1: interrows cropped with field pea (for improving nitrogen balance);
 - D2: interrows cropped with oat for organic material enhancement and/or marketable produce.
- The results of the research and the series of the experiments are expected to reduce the additional costs of the erosion damage, the chemical use and the excess water use. The successes also contribute to the reduction of some environmental indicators.