

INTERACTION STUDIES BETWEEN WINTER WHEAT AND WINTER PEA IN INTERCROPPING

Marianna Vályi-Nagy^{1*}, István Kristó², Melinda Tar³, Attila Rácz⁴, Lajos Szentpéteri¹, Katalin Irmes¹, Márta Ladányi⁵

¹Doctoral School of Plant Science, Department of Agronomy, Institute of Agronomy, Hungarian University of Agriculture and Life Sciences, Gödöllő, HUNGARY

²Cereal Research Non-Profit Ltd. Szeged, HUNGARY

³Faculty of Agriculture, Institute of Plant Sciences and Environmental Protection, University of Szeged, HUNGARY

⁴Doctoral School of Environmental Sciences, Department of Agronomy, Institute of Agronomy, Hungarian University of Agriculture and Life Sciences, Gödöllő, HUNGARY

⁵Department of Applied Statistics, Institute of Mathematics and Basic Science, Hungarian University of Agriculture and Life Sciences, Budapest, HUNGARY

*corresponding author: Valyi-Nagy.Marianna@uni-mate.hu

Intensive agriculture enables the use of high-yielding varieties with a short growing season in a large area. Fluctuating market demands, extreme weather events and increasing environmental awareness lead us to open up to novel cultivation methods. Intercropping is a special type of plant association, that can be used to mitigate these negative effects. Our investigation was carried out for three growing seasons (2020/2021, 2021/2022, 2022/2023) with a seed mixture of three winter wheat varieties (GK Szilárd, Cellule, GK Csillag) and a winter pea variety (Aviron) in three sowing densities. In effective intercropping, the companion plants avoid competition, due to the complementary use of the available resources. Competition indices, such as land equivalent ratio (LER), aggressivity (A), competitive ratio CR), actual yield loss (AYL), monetary advantage index (MAI), and intercropping advantage (IA) can refer to the interaction between winter wheat and pea. In the case of A, CR and AYL, the partial values indicate that wheat is more dominant than pea. In terms of MAI, the best profitable combination was the Cellule/Aviron 75:50 in the first two years. Overconcentration of the parcels was more beneficial for wheat yield, while pea avoided many cultivation criteria (weeds, disease, pest, lodging). Our results draw attention to the choice of the appropriate sowing density, which can contribute the success of this cultivation method.