Poster

S7 Ecology and environment

P29 Characterization of *Brachypodium* varieties as tree cover crops in Mediterranean conditions.

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Accelerated water erosion is a major environmental problem in tree crops under Mediterranean conditions, which threatens their long term sustainability (Gómez, 2017). Despite of the practical use of cover crops under these conditions, there is limited information on the prediction of the flowering and maturity dates of *Brachypodium* species for different tree growing areas within the Mediterranean. Different areas within this region, despite sharing the same climate type, present significant differences in their temperature regimes. This communication presents the preliminary results of the first year of a study aimed to calibrate a temperature-based phenology model for *Brachypodium* in Southern Spain. The four varieties currently registered in the EU: two *B. hybridum* (Ibros and Iskyri) and two *B. distachyon* (Zulema, and Kypello) were used for the study.

In two different locations in Southern Spain with contrasting temperature regimes, Córdoba (warmer with 17.8 °C average annual temperature) and Lanjarón (colder with 14.5 °C average annual temperature) a controlled experiment was carried out during the agricultural year 2018-19. At each site 8 pots (15 l in volume each) were seeded in late October with two replications of each of the four varieties. Each pod was seeded at a seed density of 1gr m^{-2} and they were irrigated regularly to prevent water stress according to the rainfall distribution of the season. The air temperature and the plants height was recorded automatically at a 30 minutes interval.

The phenological evolution of the plants was assessed regularly during the growing seasons according to Meier (2001). A phenology model based on growing degree days, GDD Eq. 1, was developed using the Richard equation following the procedure described by Gómez and Soriano (2019). Basically the models were calibrated using the experimental data of the season 2016-17 minimizing the root mean square error between predicted and observed days since sowing for each of the registered phenological stages using the solver function of Excel ®. The developed models were validated using the experimental data of season 2017-2018.

This communication presents the preliminary results of the differences in phenology among these four varieties, the calibration of the phenology model and the implications of these differences for their use as cover crops different areas among the region.

References

Gómez, J.A. 2017. Hungarian Geographical Bulletin 66: 13.

Meier, U. 2001. Estadios de las plantas mono-y dicotyledóneas BBCH Monografia. Centro Federal de Investigaciones Biológicas para Agricultura y Silvicultura.

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