

EGU22-12389

<https://doi.org/10.5194/egusphere-egu22-12389>

EGU General Assembly 2022

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Seasonal forecasts of cereal crop yields in Iberia

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Climate change is likely to impact the balance of worldwide food exchange networks and food security. Hence, the use of seasonal forecasts of precipitation and temperature may be regarded as essential for stakeholders to perform timely choices concerning the strategies required to maximize the expected cereal yield outcomes in the harvest period. The availability and ease-of-use of the seasonal forecasts from the European Centre for Medium-Range Weather Forecasts (ECMWF) system 5 (SEAS5) may be an important asset to help implement these strategies by decision makers. Nevertheless, uncertainties and reduced skill may hinder the use of such forecasts for numerous applications. Thus, this work intends to analyse the added value of using dynamical forecasts when compared to using persistent anomalies of climate conditions, with the aim of predicting the production of wheat and barley yields in Iberia. First, empirical models involving annual wheat and barley yields in Spain and monthly values of precipitation and temperature are developed with ECMWF ERA5 reanalysis. Then, dynamical and persistence forecasts are issued at different lead times, and the skill of the forecasted yield is verified through different metrics. Results presented here show that wheat and barley yield anomaly forecasts (dynamical and persistent) start to gain skill later in the season (e.g., April) and show that the added value of using the SEAS5 forecast as an alternative to persistence varies between 6 and 16 %, with better results in the southern Spain regions.

The authors would like to acknowledge the financial support FCT through project UIDB/50019/2020 – Instituto Dom Luiz.