IDENTIFICATION OF GENETIC SELECTION FOOTPRINTS IN BARLEY LANDRACES IN RELATION TO AGROCLIMATIC INDICES

INTRODUCTION
Landraces are populations of crop plants adapted to a particular environment. Extant landraces are surviving genetic archives, filing invaluable information of the selection processes they have undergone until settling in their current niches. Barley landraces were abundant in Spain, and were properly collected in germplasm banks over the last century. This study intends to establish relationships between genetic diversity of the Spanish landraces and the climate of their collection sites.

BARLEY LANDRACES
Spanish Barley Core Collection. Representative subset of 140 inbred lines derived from local Spanish landraces geo-referenced to their collection sites. They are constituted by 5 different germplasm groups, tracing back to different arrivals to the Iberian Peninsula and differential adaptation to the diversity of climates in the area.

GENETIC MARKERS
Genotyping with 10,000 SNPs for the barley landraces was carried out with an Illumina Infinium assay with 9k SNPs, and by DAR'Tseq®, Triticate. In total, close to 10,000 SNPs, were placed in the barley reference genome using the Barleymap® tool.

RESULTS
Results for selected SNPs and agroclimatic variables. Figures depict three associations found, shown as examples. In each case, TOP: Manhattan plots showing associations of genetic markers with specific agroclimatic variables.

CLIMATE
30 years of climate data. A set of maps were computed from more than 2,000 temperature stations and 7,000 precipitation stations over peninsular Spain, to assess the relationship between genetic markers and the climate variability of the territory. From the initial 120 variables a reduced set of 19 variables theoretically related to agricultural performance of winter cereals were extracted by cluster analysis and expert judgment. Basic geographic data (longitude, latitude and altitude) were also included in the dataset.

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