Improving oat crop for stress resistance through multidisciplinary approaches
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Resistance to biotic and abiotic stresses is one of the most desirable traits for many crops as it is directly related to both yield and yield stability and in extreme cases it can be responsible of the 100% of the losses. Oats are susceptible to many pathogens and environmental stresses some of them world-wide distributed and others restricted to particular regions. Breeding for stress resistance is one of the most effective, economical, and environmentally friendly means to control plant diseases and also reduce yield losses due to abiotic stresses. However, breeding of complex traits such as stress resistance is a difficult task which should take into account the importance of the genetic variability in order to find appropriate sources of resistance, integrate different selection tools based both on phenotype and on molecular (not only genetic) markers, and last but not less important it should be based on a sound understanding of the underlying resistance mechanisms. In addition considerations such as the genotype x environment interaction, or biological knowledge of the more durable resistance mechanisms to pathogens are also crucial in order to get stable cultivars. Taking this into account we will explain different approaches carried out by our group for breeding oats adapted to the agro-climatic and stressful conditions of the Mediterranean area including biotic and abiotic factors.

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