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COMMON BEAN INTELLIGENT COLLECTION EVALUATION AND IDENTIFICATION OF CLIMATE-RESILIENT CULTIVARS FOR EUROPEAN AGROFOOD SYSTEMS

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Common bean (*Phaseolus vulgaris* L.) is the most important legume for human consumption and the second most cultivated pulse crop worldwide (33 million ha, FAOSTAT 2020). Beans are a traditional food crop grown widely over Europe for grain (dry bean: 202,182 ha in 2017) and as a vegetable (green bean: 96,230 ha in 2017). In fact, 18 European traditional high quality dry bean production chains are protected by PGI and PDO. However, despite our substantial research base in Europe, the growing market for beans for sustainable healthy diets will be met from low cost imports unless the European crop is revived.

In this study, two field experiments were conducted in Sarconi (Basilicata, Southern Italy; 40° 16' 20.352" N 15° 54' 37.905" E) in 2021 and 2022. An Intelligent Collection consisting of 450 common bean accessions (landraces, cultivars and breeding lines) from 36 different countries and genebanks around the world, was grown in small plots according to a randomized block design with three replicates per genotype and evaluated according to a standardized set of vegetative and reproductive descriptors for common bean. Morpho-agronomic and phenological traits related to adaptation were assessed and significant differences between genotypes, years and genotype

x year were detected by ANOVAs. Principal Component Analysis (PCA) in the first two components explained about 80 % of the total variance allowing to identify stable and high-yielding genotypes suitable in changing environments. The obtained results can provide the genetic foundation for a revival of common bean in European agrofood systems.