UNIVERSITÀ DI PAVIA
DIPARTIMENTO DI SCIENZE DELLA TERRA E DELL'AMBIENTE
DOTTORATO DI RICERCA IN SCIENZE DELLA TERRA E DELL'AMBIENTE

FORM PER PROGETTI BANDO DOTTORATO

1. Project title

Impacts of climate change on landraces, seed production and genetic resource conservation: a case study of onion (*Allium cepa* L.)

2. Proposer

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4. Key words
(Max. 5 – at least 2)

Climate change, *Allium cepa* L., landraces, seed longevity, genetic biodiversity

5. Abstract
(Max.1.500 characters with spaces)

Climate change is increasingly affecting onion production, with significant impacts on yield stability and bulb quality. These challenges are aggravated by the progressive reduction of available plant protection products, limiting effective crop management and increasing vulnerability to biotic and abiotic stresses. These constraints not only threaten field productivity but also compromise seed production, particularly for local landraces, whose reproductive efficiency and seed viability are highly sensitive to environmental fluctuations. The conservation of onion genetic resources in germplasm banks represents a critical strategy for safeguarding biodiversity, however, seed longevity remains a limiting factor, as it declines over relatively short storage periods. This issue is particularly relevant for landraces, which are often linked to traditional agricultural systems and quality labels, and thus holding both cultural and economic value. Moreover, onion seeds are relatively rich in lipids, which contributes to a storage lifespan often shorter than 10 years, mainly due to lipid oxidation processes that accelerate seed deterioration and viability loss. In this context, it is essential to investigate the effects of climate change on onion cultivation as well as to assess the dynamics of seed viability during storage. Furthermore, exploring sustainable strategies to enhance seed performance, such as priming techniques and the use of natural biostimulants, is crucial.