



FORM PER PROGETTI BANDO DOTTORATO XXXIII CICLO

1. Project title

Agroecosystem sustainability between climate change factors and herbicides resistances

2. Proposer

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4. Key words

(Max. 5 – at least 2)

Agroecosystem sustainability, herbicide resistance, climate change, plant stress response

5. Abstract

(Max. 1.500 characters with spaces)

Weed control has become a great problem in recent decades as a consequence of the evolution of herbicide-resistant biotypes. Intense herbicide use but over time even sublethal herbicide doses cause a reduction in herbicide sensitivity at the population level and leads to the appearance of herbicide resistances. It is extremely important to implement management strategies that minimize the risks of pesticide resistance. To program herbicide treatments correctly and improve agroecosystem sustainability it is therefore necessary assessing herbicide resistance mechanisms. It is important to consider genetic and environment interactions to predict and properly monitor the evolution of herbicide resistance distinguishing target-site-resistance (TSR) and non target-site-resistance (NTSR) from epigenetic mechanisms, regulators of plant-environment interactions, mainly associated with stress adaptation. Given that herbicides induce a strong abiotic stress, it is likely that weeds respond by activating stress-signaling networks that reprogram gene expression. We hypothesize that this involves epigenetic regulation of gene function that could contribute to herbicide resistance as implicated in weed adaptation to other stresses. In this context the impact of climate change on weed herbicide susceptibility and its subsequent effects on the development of herbicide-resistant weeds will also be investigated. Herbicide resistances will be monitored in rice field environments.