LETIZIA OTTAVIANI

KEY-WORDS:
CRISPR-CAS9 - *FUSARIUM VERTICILLIOIDES* - *ZEA MAYS*

PROFILE

I am a first-year PhD student in Plant Science, specialized in Plant Biotechnology.

AFFILIATION

Department of Sustainable Crop Production (DI.PRO.VE.S.), section of Agronomy and Plant Biotechnology,
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LANGUAGES

Mother language

Level B2

HOW TO REACH ME

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PROJECT TITLE

Application of genome editing to face climate change challenges in cereal crops

Steps of the research

- Identification of candidate genes of *Zea mays* on the basis of bibliographic data, involved in the control of defense pathways in response to the attack by fungi producing mycotoxins, as *Fusarium verticillioides*.
- Over-expression and editing of candidate genes using the CRISPR-CAS9 system to obtain more resistant maize plants.
- Phenotyping of edited and transgenic maize plants through *in vivo* seedling inoculation assays, characterization of the mycotoxin content, lipidomic analysis, as well as gene expression analysis on the best performing plant lines.

Main Results

Improve the characteristics of maize to mitigate fungal pathogen attack and drought stress.

Research Contribution

Genome editing technology will allow to accelerate plant breeding by performing precise and predictable modifications directly on alleles in elite backgrounds, enhancing tolerance to dry environmental conditions and introducing resistance to fungal pathogens, in order to face climate change and avoid the use of pesticides.

Collaborations

Prof. Peter Rogowsky, Ecole Normale Supérieure de Lyon (ENSL)

Why should you care?

F. verticillioides is a major cereal pathogen causing stalk rot and ear rot in maize, negatively affecting crop productivity, and compromising food safety by producing the secondary metabolites fumonisins. This implies large use of pesticides. The increasing demand for sustainable agricultural production and less environmental impact, has led to the development of new technologies, like CRISPR-CAS9.