

Tetrazolyloximes: New Standard in Oomycetes Control

David Bernier; Pierre-Yves Coqueron; Christophe Dubost; Anne-Sophie Rebstock

*Bayer CropScience, Disease Control Chemistry,
 Centre de Recherche de La Dargoire, 14 impasse Pierre Baizet, 69009 Lyon, France
 e-mail: david.bernier@bayer.com

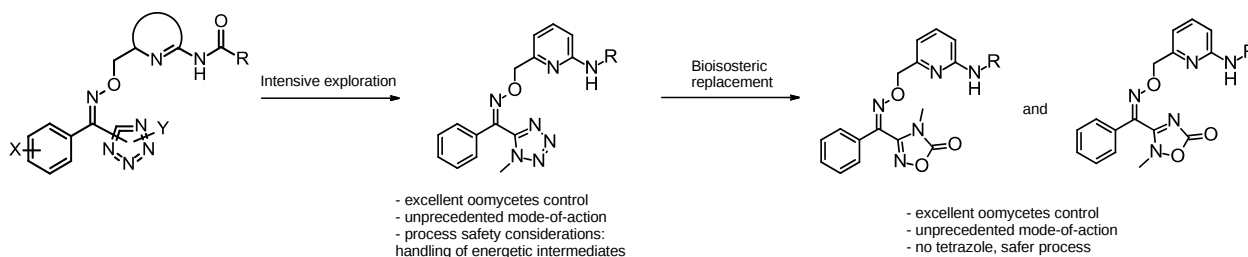
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ABSTRACT

Oomycetes are a class of fungi-like microbes. Many of these microorganisms are aggressive plant pathogens, causing economically-important crop diseases such as *Phytophthora* late blight, *Plasmopara* or *Peronospora* downy mildews as well as *Pythium* damping-off, leading to yearly losses of several billion dollars and threatening worldwide agricultural production.

In this talk, we will first present the oomycetocidal class tetrazolyloximes, as well as the surrounding competitive environment^[1] (with more than 50 patent applications published to date around this family). We will then review the exploration of the chemical landscape around this lead, along with the approaches that led to the identification of new compounds with high potency against a wide range of oomycetes, in greenhouse and in field conditions.^[2] We will comment on safety aspects relevant to the handling of tetrazoles on large scale. Cross-resistance studies and phenotyping data, supporting that these compounds act via an unprecedented mode of action, will be described, as well as the environmental chemistry affecting the stability of these compounds under agronomic conditions.^[3] Finally, we will present how strategic use of bioisosteric replacements led to the discovery of equally potent compounds while bypassing the need of energetic tetrazoles.

GRAPHICAL ABSTRACT



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2. The chemistry presented is covered by basic patent applications WO2009/020191, WO2011/110651, WO2011/161076, WO2012/000918, WO2013/037717, WO2013/098147
3. Fréneau, De Sainte Claire, Hoffmann, Vors, Geist, Euvard, Richard, *RSC Advances* **2016**, 6(7), 5512-5522 ; Fréneau, Hoffmann, Vors, Genix, Richard, De Sainte Claire, *RSC Advances* **2016**, 6(68), 63965-63972