I cambiamenti climatici

e le problematiche legate alla

presenza di micotossine nei foraggi

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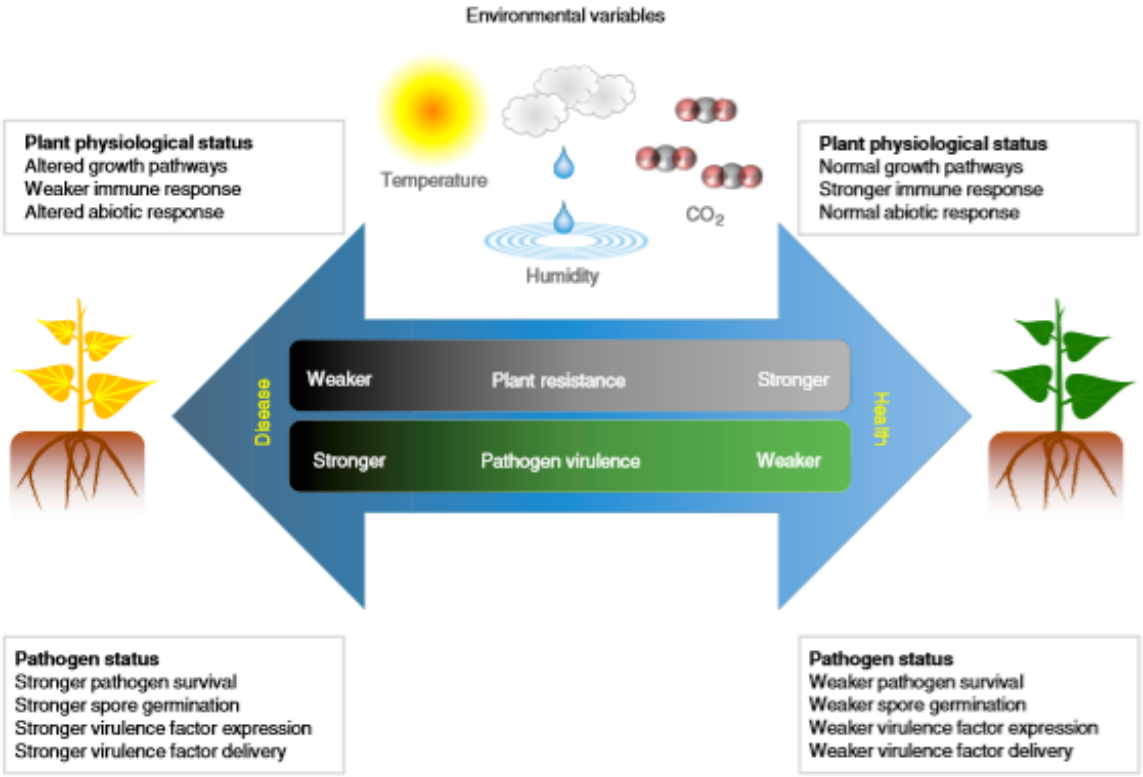
Pisa, 17 maggio 2019

CAMBIAMENTO CLIMATICO - 1

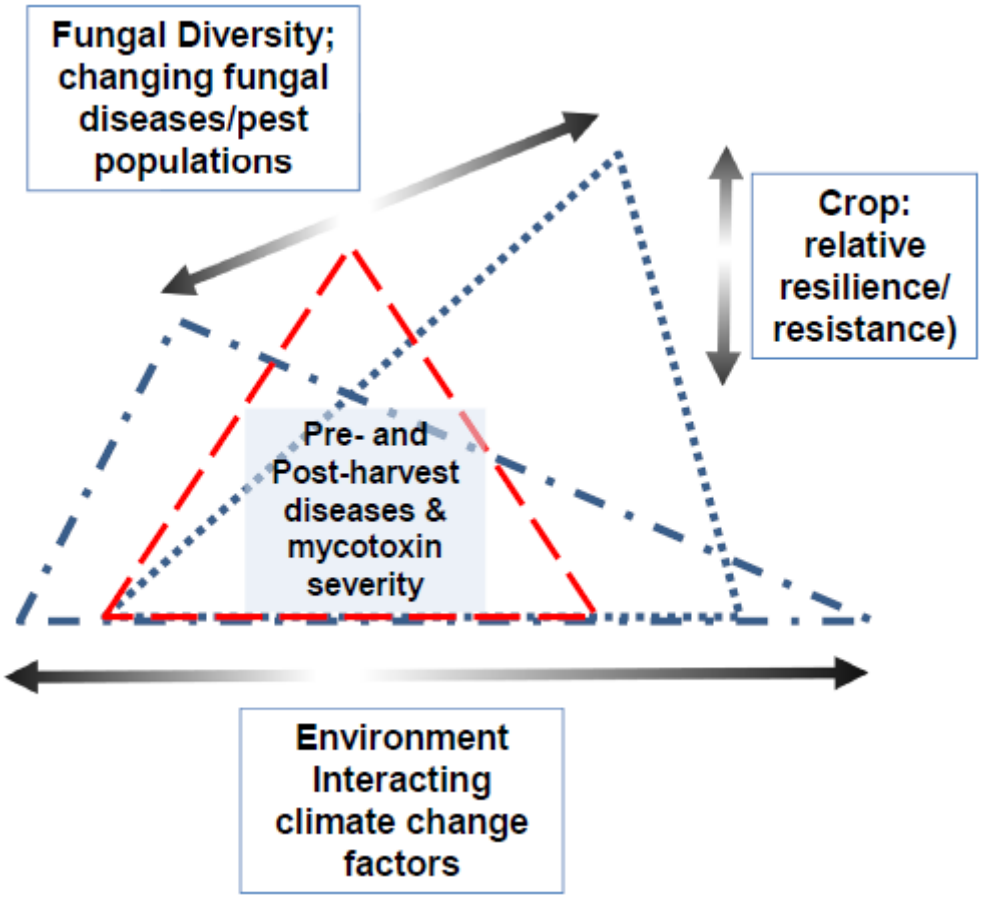
CAMBIAMENTO CLIMATICO - 2

INTERAZIONE PIANTA-PATOGENO



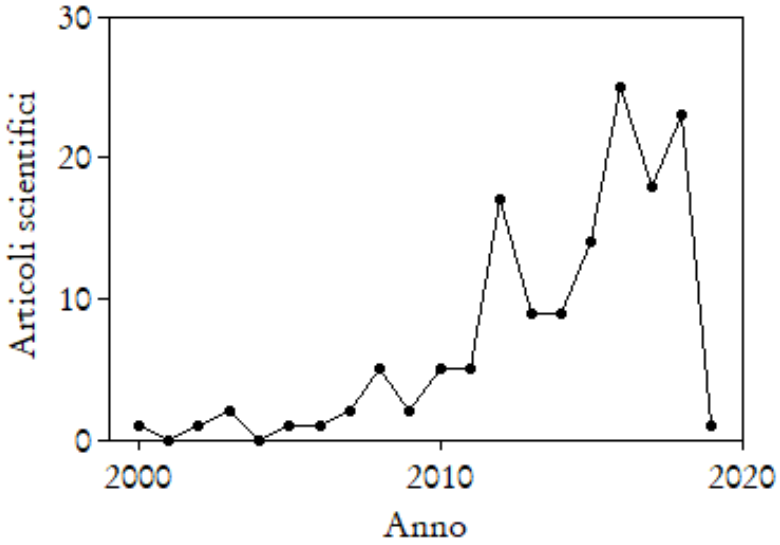
Vélasquez et al., 2018,
Current Biology 28, R619-R634

TRIANGOLO DELLA MALATTIA

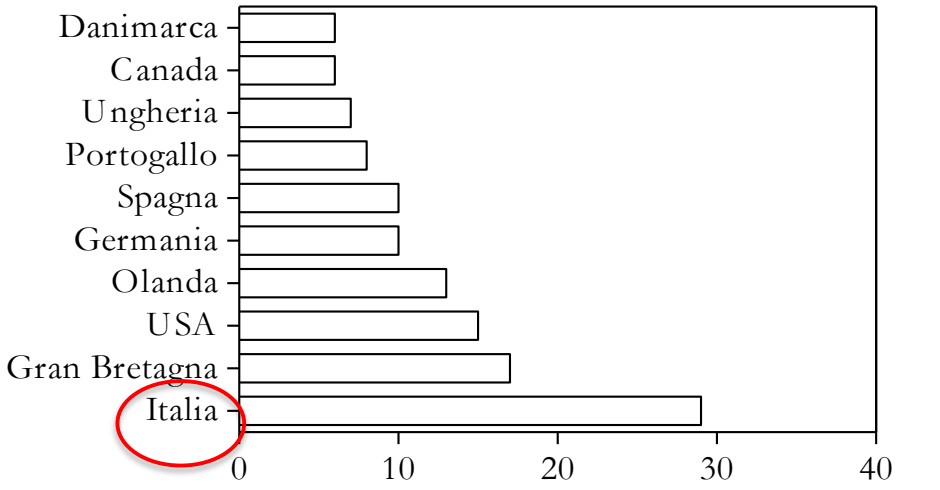


Medina et al., 2017,
Fungal Biology Reviews 31, 143-154

MICOTOSSINE E CAMBIAMENTO CLIMATICO



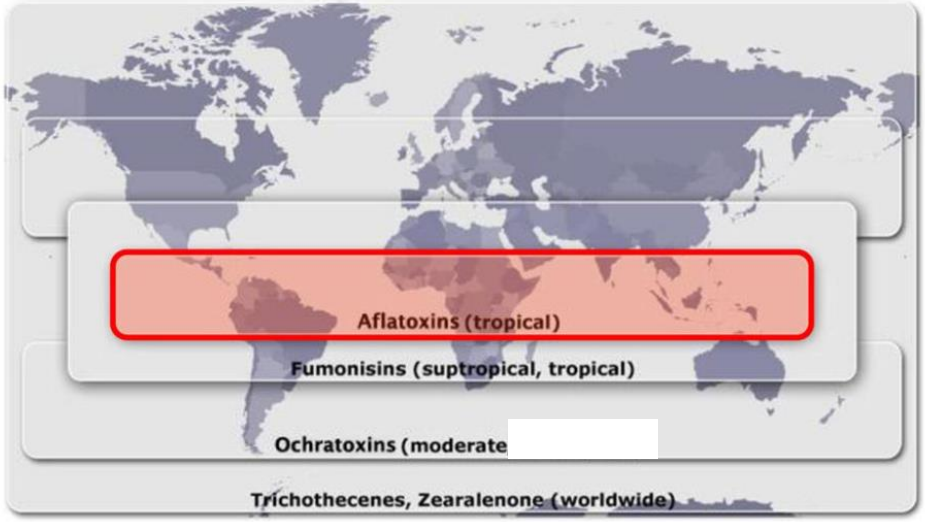
142 DOCUMENTI
PRODOTTI 2000-2019



https://www.scopus.com

PRINCIPALI MICOTOSSINE PRESENTI NEI FORAGGI

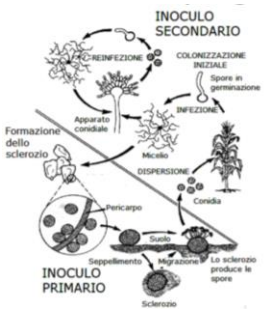
1. **AFLATOSSINE**
2. **FUMONISINE**
3. **TRICOTECENI**
4. **ZEARALENONE**

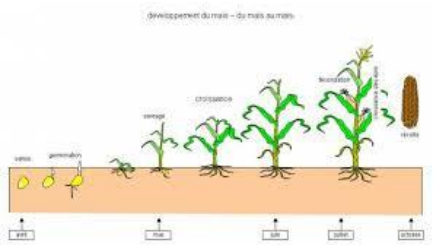


www.mycotoxins.info

FATTORI CHE INFLUENZANO LA CONTAMINAZIONE DA MICOTOSSINE

Biologia del fungo e della pianta





Condizioni ambientali

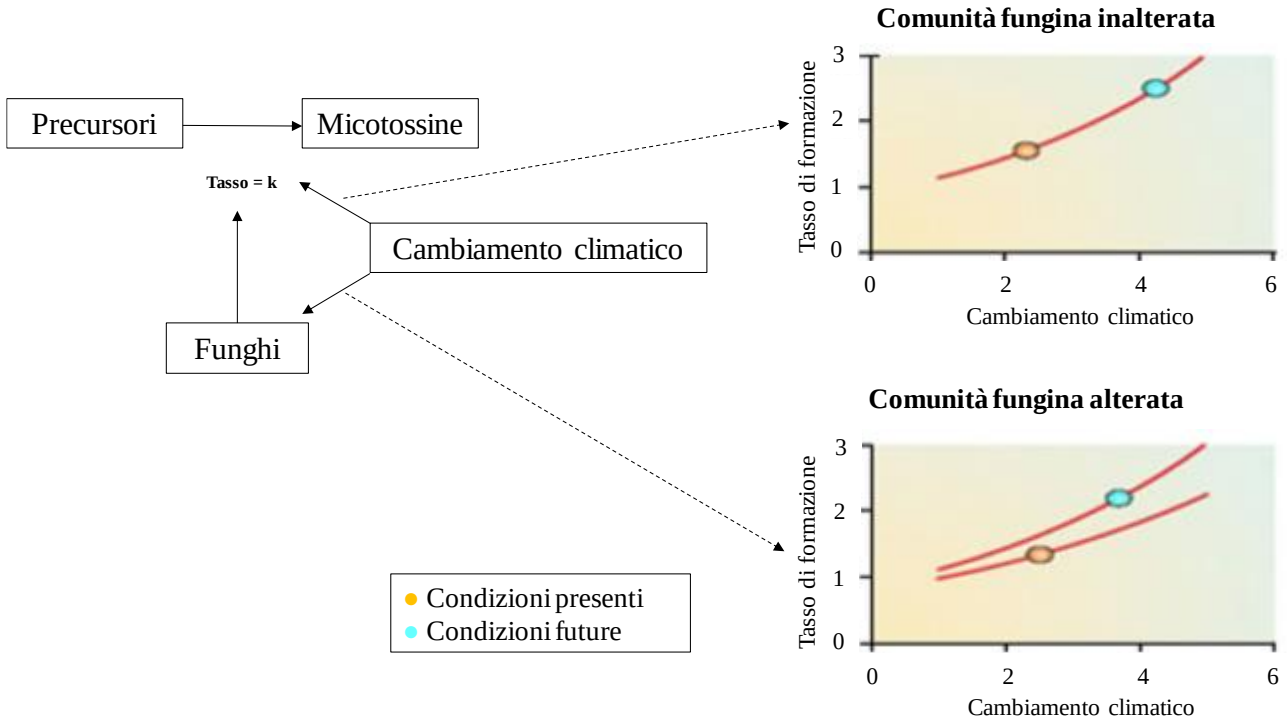
Raccolta

Stoccaggio

Uomo

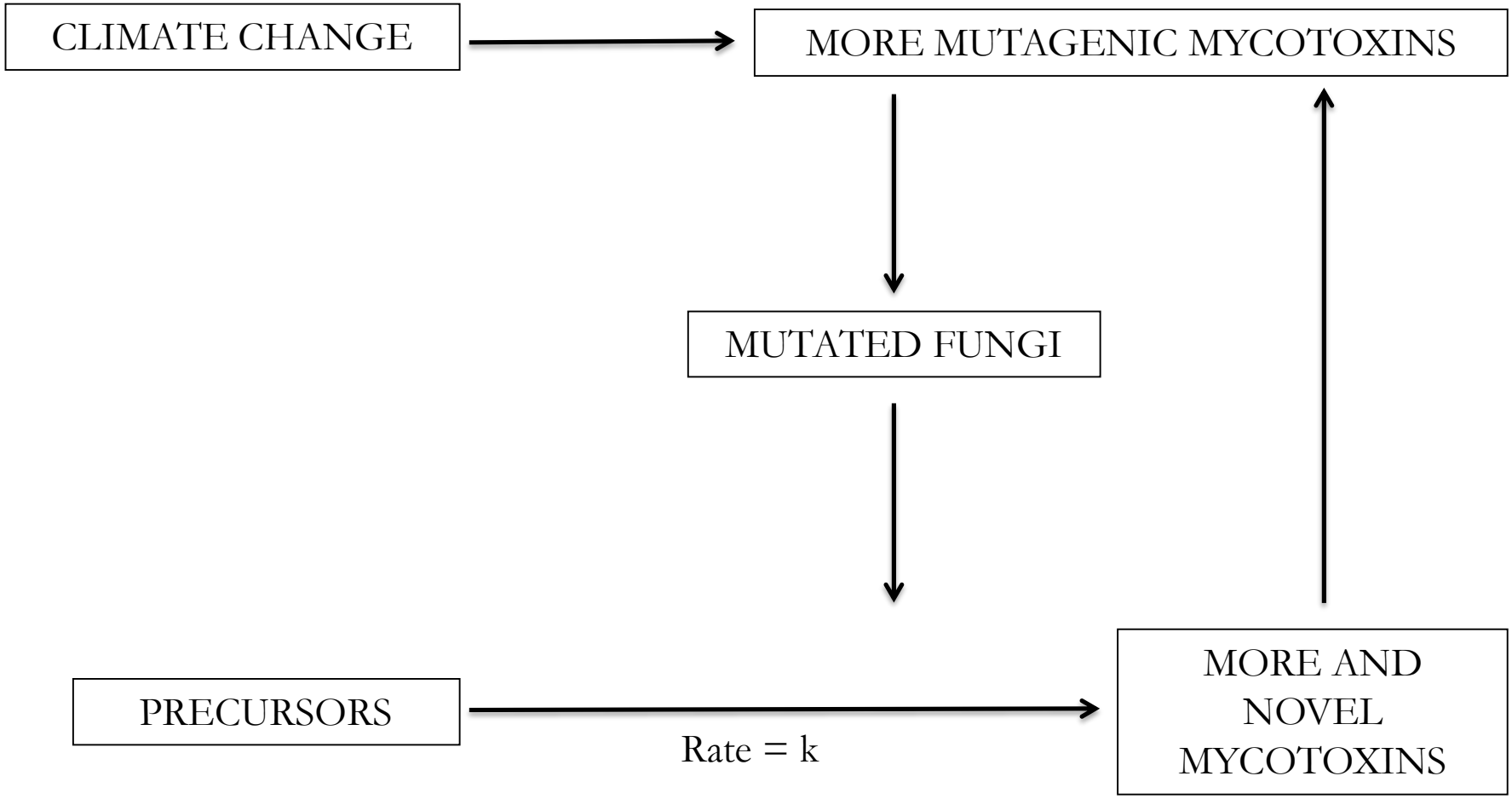
Animali

MICOTOSSINE *vs* CAMBIAMENTO CLIMATICO - 1



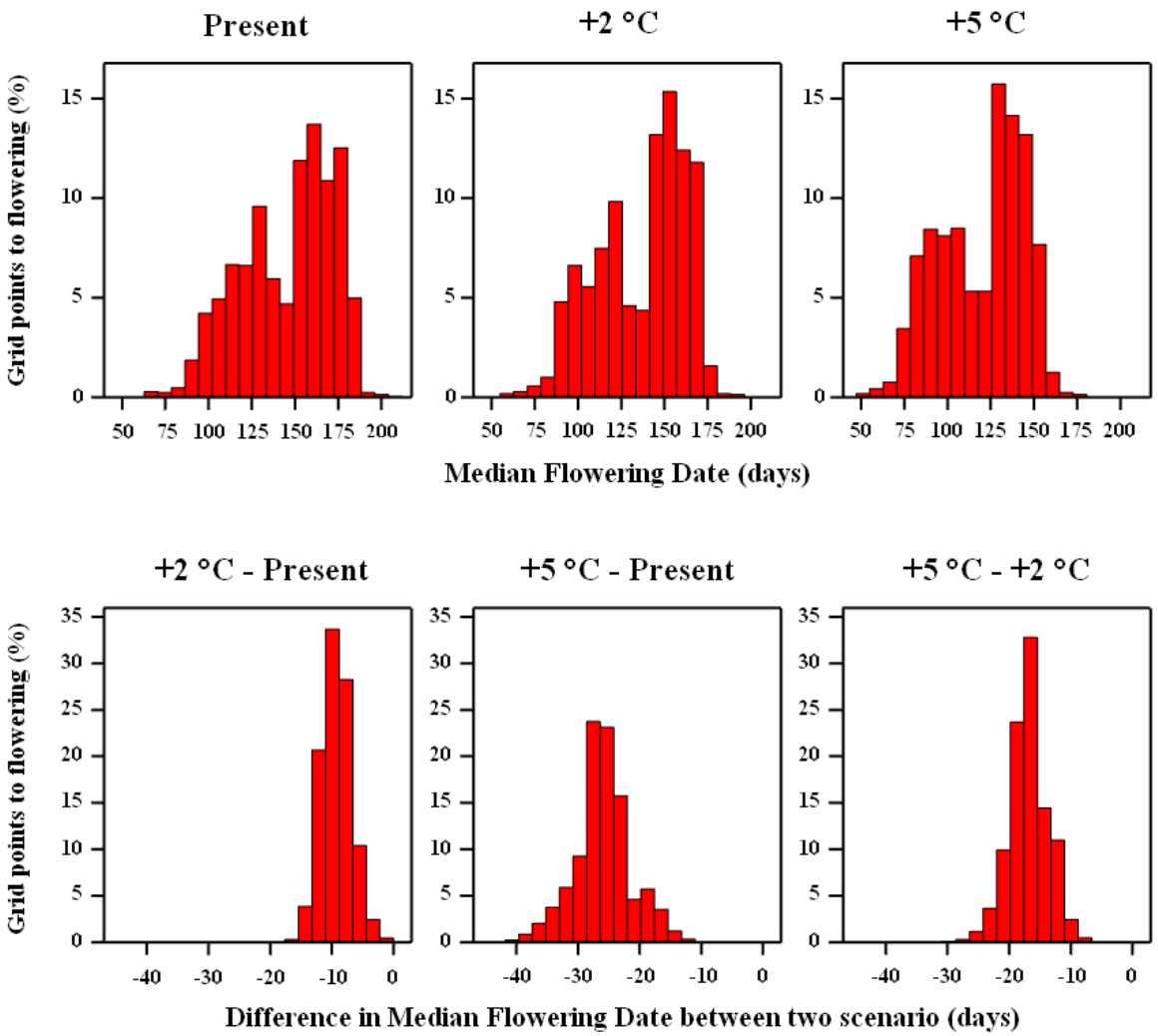
Paterson et al., 2011,
Food Research International 44, 2555-2566

MICOTOSSINE *vs* CAMBIAMENTO CLIMATICO - 2



Paterson et al., 2011,
Food Research International 44, 2555-2566

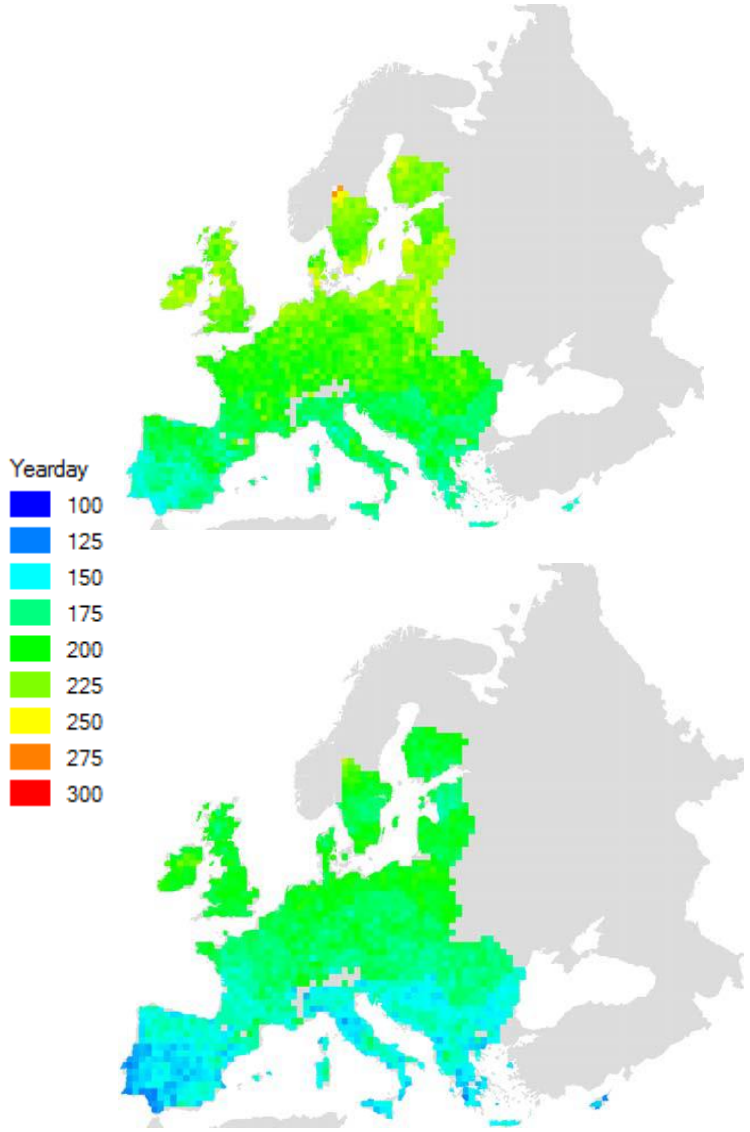
BIOLOGIA DELLA PIANTA - 1



Anticipo della fioritura del mais a causa dell'aumento della temperatura

Battilani et al., 2012
EFSA

BIOLOGIA DELLA PIANTA - 2



+5 ° C

Variazione dei tempi di raccolta del mais

Battilani et al., 2012
EFSA

EFFETTO DEL CAMBIAMENTO CLIMATICO SULLA PIANTA

Nelle regioni temperate

RESA ↑

Nelle regioni calde

RESA ↓

INFESTAZIONE ↑

EFFETTO DEL CAMBIAMENTO CLIMATICO SULLA PRODUZIONE DI MICOTOSSINE

Nelle regioni temperate

Nelle regioni calde

MICOTOSSINE

Nella fase di stoccaggio

In campo

MICOTOSSINE *vs* STRESS OSSIDATIVO

World Mycotoxin Journal, 2018; 11 (1): 113-133
SPECIAL ISSUE: *10 years World Mycotoxin Journal*

Mycotoxins and oxidative stress: where are we?

E.O. da Silva[1], A.P.F.L. Bracarense[1*] and I.P. Oswald[2*]

molecules

MDPI

Review

Fusarium Toxins in Cereals: Occurrence, Legislation, Factors Promoting the Appearance and Their Management

Davide Ferrigo †, Alessandro Raiola † and Roberto Causin *

Aflatoxigenesis induced in *Aspergillus flavus* by oxidative stress and reduction by phenolic antioxidants from tree nuts

N. Mahoney, R. Molyneux, J. Kim, B. Campbell, A. Waiss, A. Hagerman

World Mycotoxin Journal: 3 (1) - Pages: 49 - 57

Toxicon 54 (2009) 513–518

Contents lists available at ScienceDirect

Toxicon

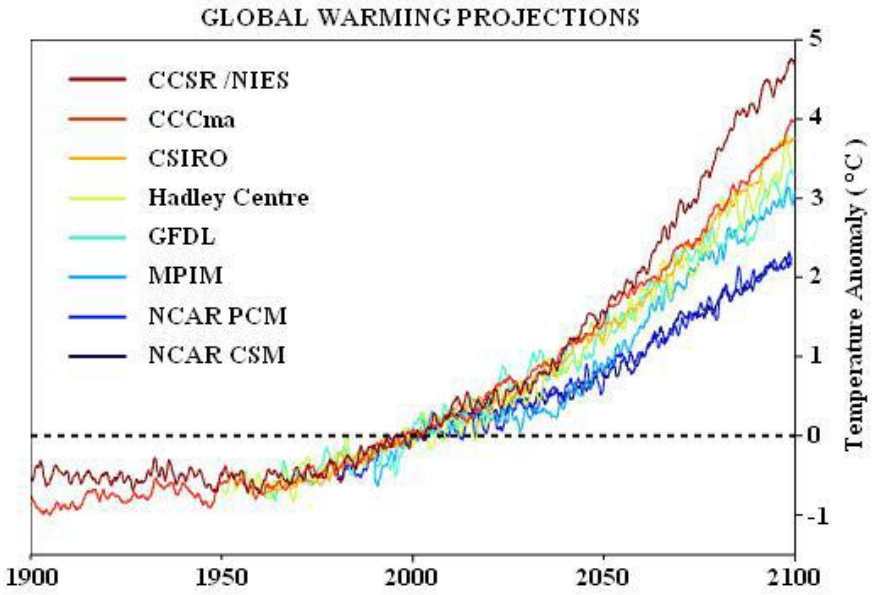
journal homepage: www.elsevier.com/locate/toxicon

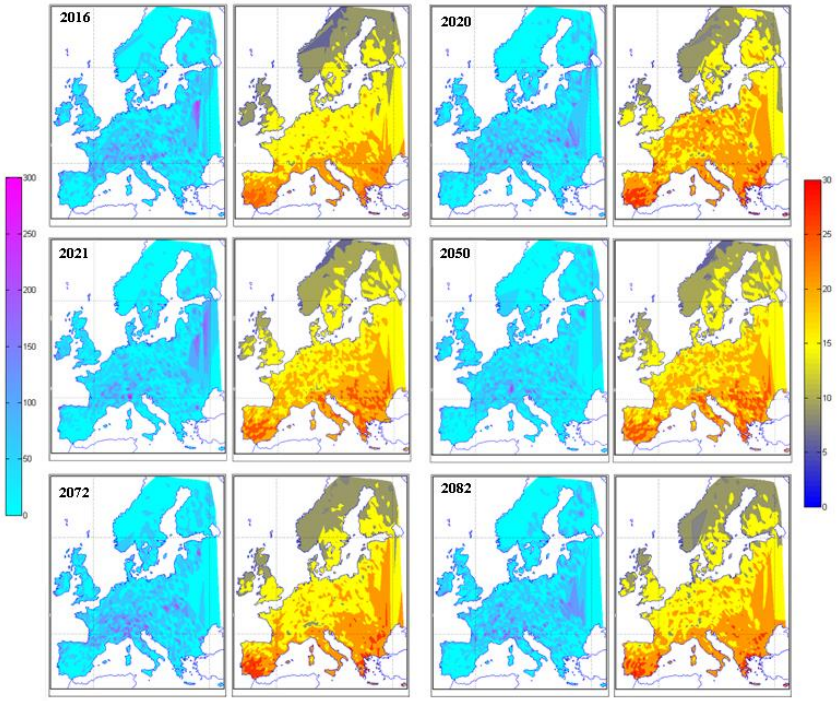
ELSEVIER

The role of oxidative stress in deoxynivalenol-induced DNA damage in HepG2 cells

Xiaoou Zhang[a], Liping Jiang[b], Chengyan Geng[b], Jun Cao[a], Laifu Zhong[a,*]

SCENARI FUTURI

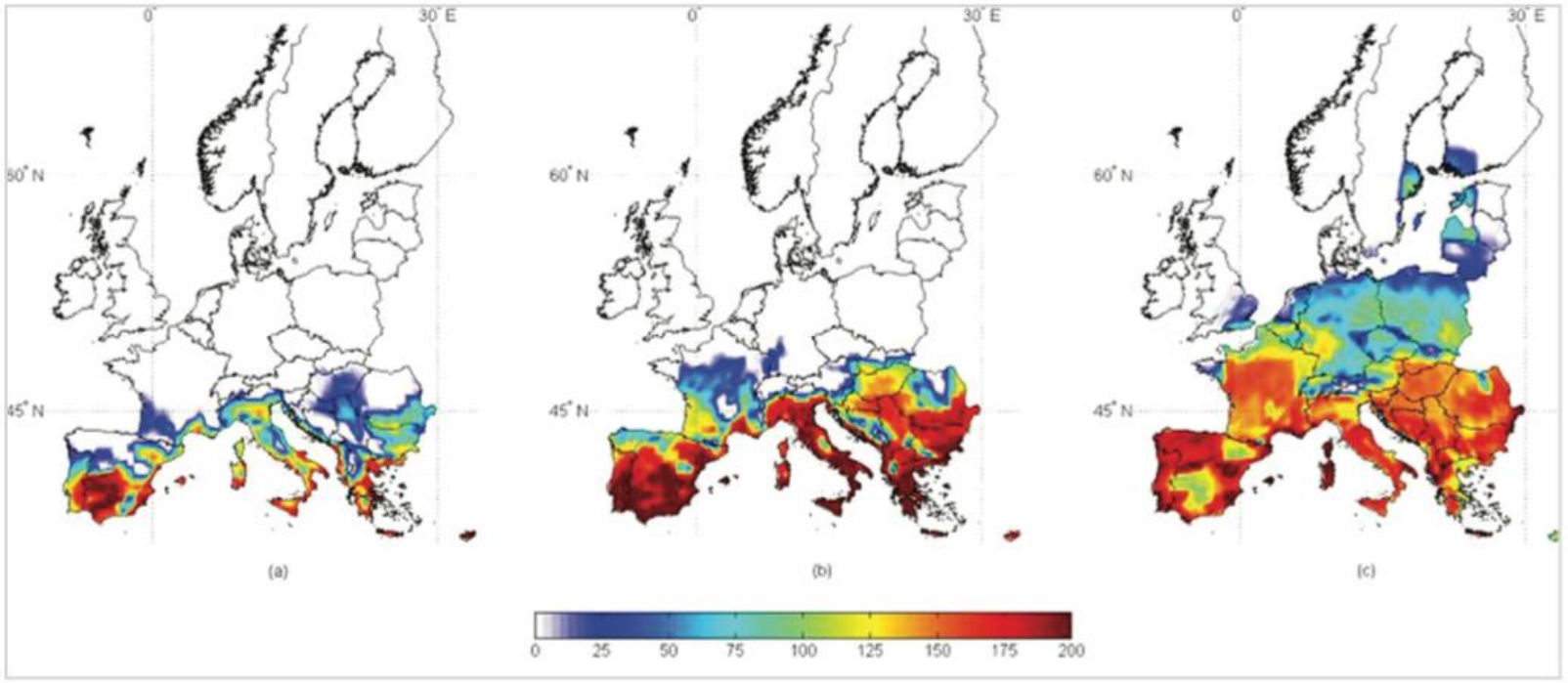




IPCC

AFLATOSSINE E AUMENTO DI TEMPERATURA

Risk maps for aflatoxin contamination in maize at harvest in 3 different climate scenarios, present, +2 °C, +5 °C



Source: Battilani *et al.* (2016)[21]
Material available under Public License, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4828719/

FATTORI CLIMATICI

1. **STRESS IDRICO**

2. **VARIAZIONI DI TEMPERATURA**

3. **AUMENTO DELLA CONCENTRAZIONE DI ANIDRIDE CARBONICA**

DISTRIBUZIONE GEOGRAFICA

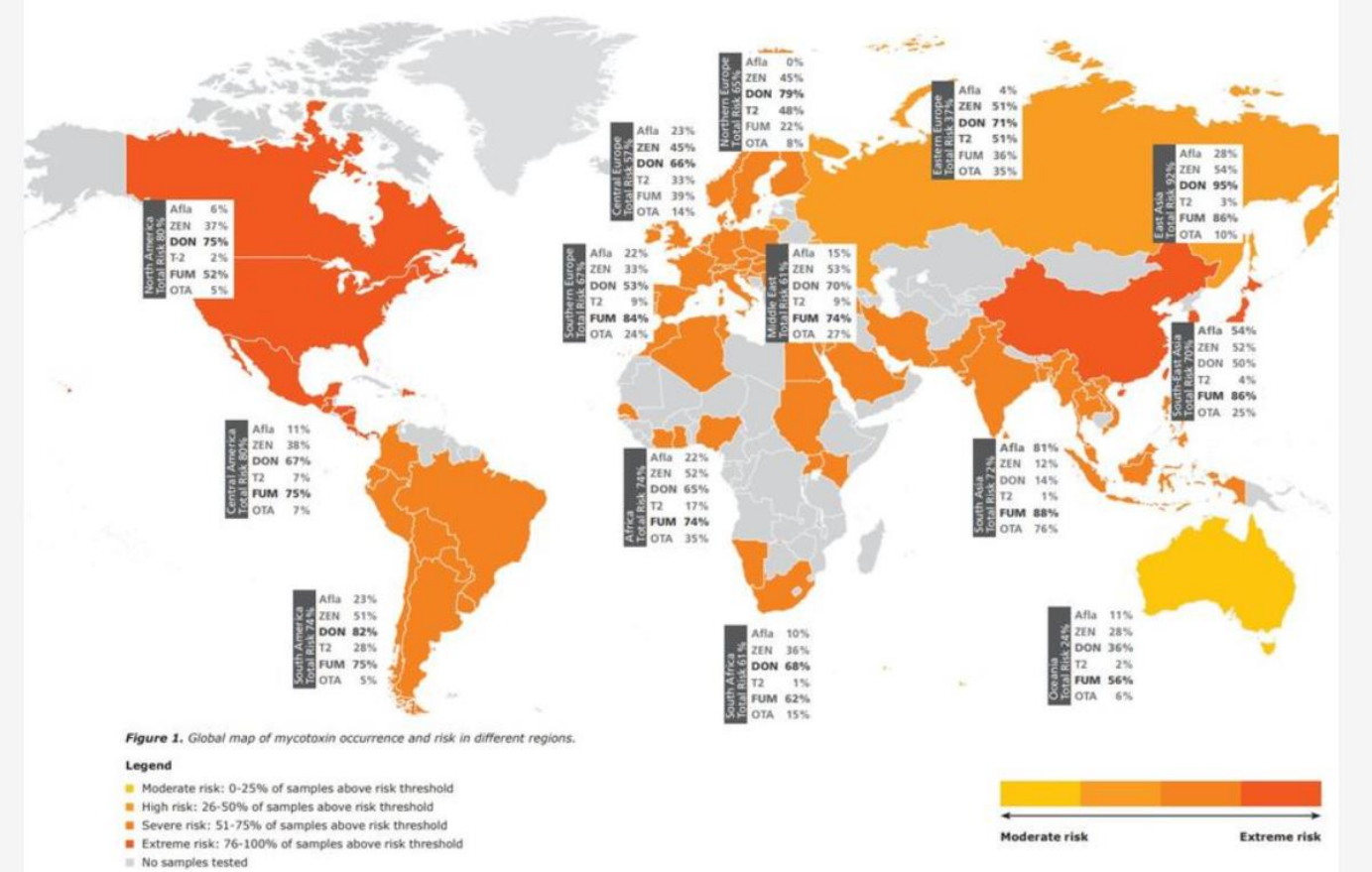
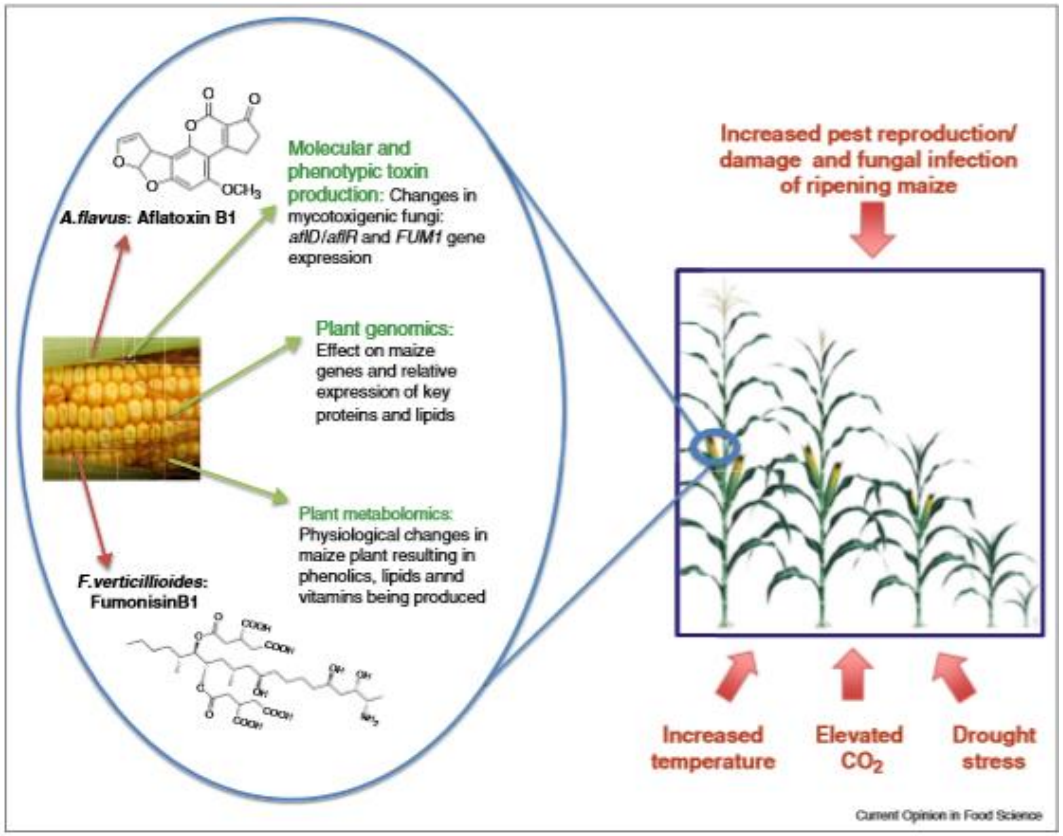


Figure 1. *Global map of mycotoxin occurrence and risk in different regions.*

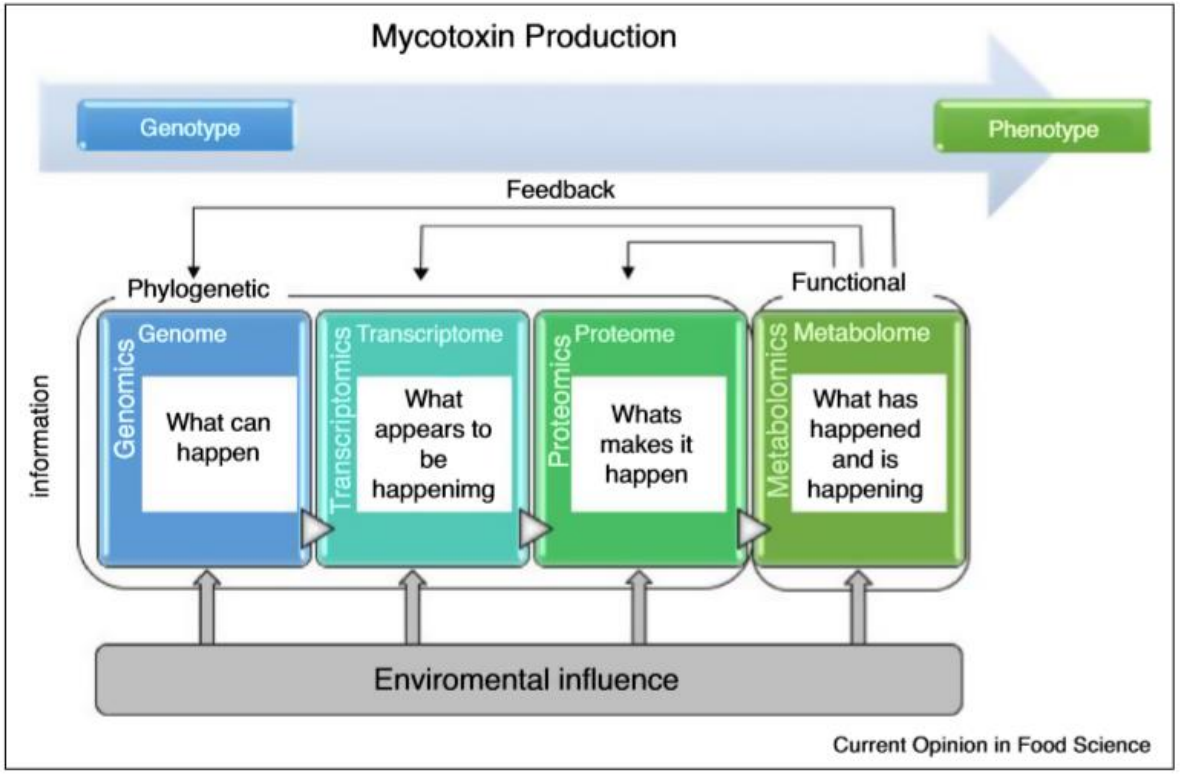
https://www.biomin.net

APPROCCIO MULTIDISCIPLINARE - 1



Medina et al., 2015,
Current Opinion in Food Science 5, 99-104

APPROCCIO MULTIDISCIPLINARE - 2



Garcia-Cela et al., 2018,
Current Opinion in Food Science 23, 97-104

CONCLUSIONI - 1

Elevate temperature e deficit idrico sono delle condizioni favorevoli alle infezioni dei funghi micotossigeni.

La contaminazione da micotossine non può più essere considerata una semplice **emergenza.**

Interventi futuri:

PREVENZIONE e RICERCA

CONCLUSIONI - 2

Prevenzione in pre-raccolta: corretta scelta del materiale vegetale e applicazione di idonee pratiche agronomiche.

Prevenzione in raccolta: individuazione di un'idonea epoca di raccolta.

Prevenzione in post-raccolta: corretto stoccaggio, rapida essiccazione, sistemi di decontaminazione e detossificazione.

CONCLUSIONI - 3

Tecniche di contenimento di micotossine

durante la coltivazione del mais: CO.MICO

Giuseppe CONTE, Marco FONTANELLI,

Francesca GALLI, Elisa PELLEGRINI

Giovanni RALLO

https://www.youtube.com/watch?v=yi46ZQLjMYw