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Climate change and resilience of biocontrol agents for mycotoxin control

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There has been an impetus in the development of biocontrol agents (BCAs) with the removal of a number of chemical compounds in the market, especially in the European Union. This has been a major driver in the development of Integrated Pest Management systems (IPM) for both pest and disease control. For control of mycotoxigenic fungi, there is interest in both control of colonization and more importantly toxin contamination of staple food commodities. Thus the relative inoculum potential of biocontrol agent vs the toxigenic specie sis important. The major bottlenecks in the production and development of formulations of biocontrol agents are the resilience of the strains, inoculum quality and formulation with effective field efficacy. It was recently been shown for mycotoxigenic fungi such as *Aspergillus flavus*, under extreme climate change conditions, growth is not affected although there may be a stimulation of aflatoxin production. Thus, the development of resilient biocontrol strains which can may have conserved control efficacy but have the necessary resilience becomes critical form a food security point of view. Indeed, under predicted climate change scenarios the diversity of pests and fungal diseases are expected to have profound impacts on food security. Thus, when examining the identification of potential biocontrol strains, production and formulation it is critical that the resilience to CC environmental factors are included and quantified. The problems in relation to the physiological competence and the relative humidity range over which efficacy can occur, especially pre-harvest may be increase under climate change conditions. We have examined the efficacy of atoxigenic strains of *A. flavus* and *Clanostachys rosea* and other candidates for control of *A. flavus* and aflatoxin contamination of maize, and for *Fusarium verticillioides* and fumonisin toxin control. We have also examined the potential use of fluidized-bed drying, nanoparticles/nanospheres and encapsulation approaches to enhance the potential for the production of resilient biocontrol formulations. The objective being the delivery of biocontrol efficacy under extreme interacting climatic conditions. The potential impact of climate change factors on the efficacy of biocontrol of fungal diseases and mycotoxins are discussed.