

7<sup>th</sup> Global Summit on

# Plant Science

October 07-08, 2019 | Madrid, Spain

## Improving crop disease resistance: new promising trends

**Prashant Singh**

Department of Botany, University of Rajasthan, Jaipur, India.

One of the biggest challenges for food security in the 21st century is to improve crop yield stability through the development of disease-resistant crops. Plants are constantly exposed to potentially pathogenic microbes present in their surrounding environment. Population burst, loss of agricultural land due to climate change, erosion and lack of water require that we reduce production losses such as those caused by pest and pathogens as much as possible. As a result, biotic stress, a loss of fitness caused to an individual by other organisms places a major constraint on plant growth.

In the absence of genetic resistance in crops, food production heavily depends on use of chemical to control pathogens. Despite their effectiveness, chemicals based plant defense have detrimental environmental consequences and creating risks to the wider environment. Modern synthetic chemicals usually have reduced environmental toxicity; however, they are expensive and only available to advanced agricultural production systems. Moreover, as with antibiotics, discovery of new chemical to control plant disease is difficult and extensive use of current agents may result in selection of pathogen strains tolerant to pesticides.

Reducing the dependence of food production on chemical control is a key goal of plant pathology research. One of the major goals of plant research in the 21st century is to increase our understanding of the plant defense system and unravel how this is manipulated by pathogens, in order to engineer crops with both durable resistance against pathogens and increased yields.

Plants have evolved a sophisticated immune system to resist pests and diseases. Apart from their innate immune system controlling pre programmed defence reactions, plants can also increase the responsiveness of their immune system in response to selected environmental signals. This phenomenon is known as “defense priming”. Although defense priming rarely provides full protection, its broad spectrum effectiveness, long-lasting durability and inherited to future generations make it attractive for integrated disease management. I will discuss the role of plant natural defense and priming in crop improvement and sustainability.