

# The Role of Plant Pathology and Plant Pathology Journals in Future Food Security

Louis K. Prom\*

USDA-ARS, Plains Area Agricultural Research Center, College Station, Texas 77845, USA

\*Corresponding author: Louis K. Prom, Adjunct Professor, Department of Plant Pathology & Microbiology, Texas A&M University, USA, Tel: 979 260 9393; E-mail: louis.prom@ars.usda.gov

Received Date: October 07, 2017; Accepted Date: October 31, 2017; Published Date: November 6, 2017

Citation: Prom KL (2017) Editorial: The Role of Plant Pathology and Plant Pathology Journals in Future Food Security. Res J Plant Pathol Vol.1 No.1: 01

Copyright: ©2017 Prom KL. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Editorial

A principal application of Plant Pathology is the protection of crop yields, ensuring high food quality, maintaining low spoilage during post-harvest storage, and understanding the host-pathogen interaction. Plant Pathologists continually monitor the impact of microorganisms on our food supply by their effects on crop plant growth, infection of the harvests, persistence in processed products, interaction with the environment, and further spread in crop production areas. They routinely measure economic loss due to infection of plants by microorganisms and this helps formulate economic and scientific research policies to protect our plant food supplies. With the expected increase in the world's population to around 9.1 billion [1-3], increase in crop production which includes limiting the effects of noxious weeds, insects, and diseases incited by fungi, viruses, nematodes, and bacteria will be needed to meet this challenge. Plant Pathologists will play an integral role by preventing the impact of plant diseases in the field through the identification of effective management strategies, understanding the interactions among the host, pathogen, vector, and the environment, monitoring any changes in the pathogen population, and utilizing reliable techniques, including molecular techniques for rapid evaluation and identification of resistant crop germplasm sources. The prevention of storage losses due to microorganisms, some of which have the capacity to produce mycotoxins both in the field and in storage also will be a critical factor in increasing food security.

Over the centuries, Plant Pathologists have been at the forefront in addressing a number of plant disease epidemics such as late blight of potato, coffee rust, Panama disease of bananas, leaf blight of rice, etc., that have caused enormous crop failures and resultant famine and mass migrations [2]. In order to feed the ever increasing world populace, annual cereal production, including wheat will have to be increased to around 3 billion tons by 2050, when compared to today's output of 2.1 tons [3]. Therefore, losses due to biotic and abiotic stresses will have to be minimized to reach this goal. Plant diseases cause significant losses to cereal crops, for instance, under severe stem rust epidemics on wheat, yield loss can reach 70% [5]. It is

imperative that Plant Pathologists continue to find solutions to plant disease epidemics, such as the recent emergence of a new virulent pathotype of the wheat stem rust, *Puccinia graminis f. sp. tritici* (Pgt) [4].

This new Pgt pathotype designated as TTKSK (synonym Ug99) first observed in Uganda was able to overcome the stem rust resistant gene Sr31 which provided protection from the disease in most wheat growing regions worldwide [4]. As a result, Laidò et al. evaluated 230 tetraploid wheat accessions from an association mapping panel under greenhouse condition to identify resistant sources to TTKSK [5]. Results from this study revealed a number of QTL on all chromosomes with a few that are of interest for further evaluation [5]. Similarly, a new strain of stem rust referred to as TTTTF detected in Europe devastated tens of thousands of crops in Sicily last year [1]. Thus, the identification of resistant sources to these and other diseases will be the most economical and environmentally sound control strategy, and thereby, contribute to global food security.

In summation, the field of Plant Pathology, Research Journal of Plant Pathology and other related publications will continue to play an integral part in the dissemination of information and offering sound ideas and management strategies to new and old disease problems; thereby, ensuring global food security.

## References

1. Bhattacharya S (2017) Deadly new wheat disease threatens Europe's crops Nature | News, Vol. 542, Issue 7640.
2. Campbell CL, Madden LV (1990) Introduction to Plant Disease Epidemiology: John Wiley & Sons, New York, NY. 532 pp.
3. FAO (2009) How to feed the world in 2050.
4. Figueroa M, Upadhyaya NM, Sperschneider J, Park RF, Szabo LJ, et al. (2016) Changing the game: Using integrative genomics to probe virulence mechanisms of the stem rust pathogen *Puccinia graminis f. sp. tritici*. Front. Plant Science 7:205.
5. Laidò G, Panio G, Marone D, Russo MA, Ficco DBM, et al. (2015) Identification of new resistant loci to African stem rust race TTKSK in tetraploid wheats based on linkage and genome-wide association mapping. Front. Plant Science 6:1033.