

For [10<sup>th</sup> International Congress of Plant Pathology](#), Beijing, August 2013

Media Brief on  
**PLANT DISEASES AND GLOBAL FOOD SECURITY**

By the [International Society for Plant Pathology](#)

World population has recently passed 7 billion. Of these, 1 billion are inadequately nourished (FAO).

It is hard to imagine 1 billion people. Consider merely counting them: allowing just 1 second for each, counting day and night, it would take more than 30 years.

Malnutrition claims lives, particularly of the most vulnerable – 18,000 children every day according to and from the World Food Program, equivalent to 45 jumbo jets crashing with the loss of everyone on board, every day. This is an appalling tragedy in the true sense of the word.

Such misery is avoidable. Good husbandry (of crops and livestock), good soil, good management of water, good genetic stock, good nutrition, good pest and disease management, good storage and distribution, good markets – all can interact to contribute to food security through production of enough nutritious food, and through making it available where it is needed. Good understanding of these principles, through good training, is an obvious prerequisite.

Management of crop pests and diseases is a key component of this network of good practice – and this is one where the [International Society for Plant Pathology \(ISPP\)](#) makes a small but focused contribution. Every five years, an International Congress of Plant Pathology (ICPP) is held. [The next one](#), in 2013, is in Beijing, organized by the Chinese Society for Plant Pathology.

Just 14 crops provide the bulk of food for human consumption (Strange & Scott, 2005). All are subject to disease, the major groups of pathogens being viruses, bacteria, Oomycetes, fungi, nematodes and parasitic plants. At least 10% of global crop production is lost to diseases.

Crop diseases can, at times, seriously compromise food security. For example, Potato Blight, caused by the Oomycete *Phytophthora infestans*, struck Europe like "a bolt from the blue" in the 1840s. In Ireland, about a million people died of starvation and rather more than a million attempted to emigrate. The reason for this calamity was the arrival in Europe of a new virulent strain of the pathogen.

There have been other disasters caused by plant diseases such as the Great Bengal Famine of 1943. An estimated 2 million people died owing to the high dependence of most of the population on a single crop, rice, which was attacked by the fungus *Cochliobolus miyabeanus*.

In the Southern Corn Leaf Blight epidemic of 1970-71 in the USA, in some areas the corn (maize) crop was completely destroyed by another fungus from the same genus, *Cochliobolus heterostrophus*. In this developed country alternative sources of nutrition were plentiful so, although the effect on the agricultural economy was severe, no one died.

Among the plant disease challenges of today is a new strain of the Wheat Stem Rust fungus *Puccinia graminis*, strain Ug99, discovered in Uganda in 1999 and now spreading in Africa, Asia and the Middle East. It is able to spread because it has new genetic characteristics that make it virulent on existing varieties of wheat. This presents the wheat breeders of the world with a challenge, requiring about 10 years work, to develop new resistant varieties.

It is difficult to predict the origin of the next plant disease catastrophe that will affect one or other of our crops vital to food security in some part of the globe. However, of two things we can be certain, that there is inadequate control of known diseases in many parts of the world today, and that in the future there will be some unpleasant shocks from pathogens that have evolved new characteristics.

In 1974 the World Food Conference declared:

"Every man, woman and child has the inalienable right to be free from hunger and malnutrition"

The UN has set out 8 Millennium Development Goals to be attained by 2015.

Goal 1 sets out to halve, between 1990 and 2015, the percentage of people whose income is less than \$1 a day.

Trends are in the right direction, especially in S Asia, including India, and even more in E Asia, including China.

So there is some basis for encouragement. But there is little comfort for those whose income remains anywhere near \$1 per day. So there remains an enormous challenge.

Can we be content that >30% of people in South Asia and >40% in Subsaharan Africa subsist on less than \$1 a day?

And if food is short now, and the planet has limited agricultural area, what are the implications of the inexorable increase in world population? World population is expected to grow 38% from 1990 to 2015, the time span for which the Millennium Development Goal has targeted a halving of poverty and hunger.

#### REFERENCE

Strange RN, Scott PR (2005) Plant Disease: A Threat to Global Food Security  
*Annual Review of Phytopathology* 43, 83-116.

<http://www.annualreviews.org/eprint/yFcC7tkszntcq7hNwUTi/full/10.1146/annurev.phyto.43.1130.04.133839>.

Also:

[https://www.researchgate.net/publication/7680906\\_Plant\\_Disease\\_A\\_Threat\\_to\\_Global\\_Food\\_Security](https://www.researchgate.net/publication/7680906_Plant_Disease_A_Threat_to_Global_Food_Security)

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#### **CAN WE IMPROVE GLOBAL FOOD SECURITY?**

Session Co-ordinators (on behalf of ISPP Task Force on Global Food Security) Peter Scott & Richard Strange

This section of the program, planned by the International Society for Plant Pathology (ISPP) through its Task Force on Global Food Security, is intended to direct the attention of participants to the enormity of the issue of global food security, and to suggest practical actions that can be taken to move towards sustainable food security. An item on food security has been a regular feature of the International Congress of Plant Pathology since, in 1998, Dr Norman Borlaug, Nobel Peace Prize

Laureate, challenged ISPP members to take action to address food security issues, including those in which plant pathogens play a role but also in a broader context.

◆ The program for Beijing takes a broad approach. Like the journal *Food Security*, also a product of ISPP's thinking since Norman Borlaug's 1998 challenge, it recognizes that food security goes far beyond plant pathology, and indeed far beyond plants.

◆ The first part of the program, Plenary Session 2, consists of presentations by experts, aiming to address the multifaceted nature of the challenge of food security – the physical environment; the biological environment, including plant disease; and the economic, sociological and political environment.

◆ The second part, Evening Session E1, includes an analysis of food insecurity by a recent World Food Prize Laureate, and a special report from ISPP's Challenge Program, focusing on public awareness of plant disease in South Africa.

◆ Finally, one hour is reserved for questions from the floor to those who have made presentations, constituted as a panel of experts.

ISPP's intention is that this program will suggest further examples of action towards aspects of global food security. These will be necessarily limited in view of the resources of the Society, but they can be focused on tangible and achievable benefit where food security is a challenge.

Tuesday 27 August 2013

#### PLENARY SESSION

##### **CAN WE IMPROVE GLOBAL FOOD SECURITY?**

Chair: Lodovica Gullino, President, International Society for Plant Pathology

Richard Strange (University College London)  
"Adequate Nutrition for all by 2050". Setting the scene.

Zhaohui Li (China Agricultural University)  
Physical limitations and challenges for food security: A story of China

Fen Beed (International Institute of Tropical Agriculture)  
Managing the biological environment to promote and sustain crop productivity and quality

Ulrike Grote (Leibniz University Hannover)  
Can we improve global food security? The economic, sociological and political environment

Wednesday 28 August 2013

#### EVENING SESSION

##### **1 BILLION HUNGRY PEOPLE: WHAT CAN WE DO?**

Chair: Richard Strange (University College London)

Lise Korsten (University of Pretoria)

Special report from ISPP Challenge Programme: How can we change public perceptions of food security?

Gebisa Ejeta (Purdue University, World Food Prize Laureate) (The Glenn Anderson Lecture)

“1 billion hungry people: what can we do?”

OPEN DISCUSSION WITH EXPERT PANEL

Gebisa Ejeta (Purdue University)

Lise Korsten (University of Pretoria)

Zhaohui Li (China Agricultural University)

Fen Beed (International Institute of Tropical Agriculture)

Ulrike Grote (Leibniz Universität Hannover)

Abstracts from [10<sup>th</sup> International Congress of Plant Pathology](http://www.isppweb.org/ICPP/ICPP_2008.pdf) are archived at:

[http://www.isppweb.org/ICPP/ICPP\\_2008.pdf](http://www.isppweb.org/ICPP/ICPP_2008.pdf)