Dr. S. Savary, Plant Pathologist IRRI talks about Rice diseases

Pantnagar. September 11, 2009. Dr. S. Savary, Plant Pathologist of the International Rice Research Institute gave a very useful talk on assessing the importance of rice diseases, today, and tomorrow in College of Agriculture, Pantnagar. Addressing scientists and student he said that rice, the main food crop of India, as well as of South Asia, and worldwide, is affected by a number of diseases. These include bacterial blight, blast, sheath blight, brown spot, stem rot, and sheath rot, for example. Farmers have to manage rice diseases as one component of their overall management practices; therefore, they cannot afford complicated measures, each for one disease at a time. The most efficient way to provide rice crop with protection against diseases, as a whole, is plant resistance. This is why plant pathologists have been working for decades with breeders and other agricultural scientists to incorporate resistance genes in rice varieties. Aside from its efficiency, resistance to diseases is easy to convey to farmers on and it is a pro-poor technology, since farmers do not have to pay a premium for the improved, resistant varieties. A major drawback of breeding for resistance is that it takes a minimum of 10 years to bread, multiply, and release a new variety. Another drawback of the technology is that many pathogens adapt to resistance genes, so that varieties are no longer resistant; this is why plant pathologists must know plant pathogens (their biology, their genetics) well-however, modern breeding techniques now enable pathologists to address new strains of pathogens, and improve varieties as new, aggressive pathogen strains of pathogens emerge.

Ten years to develop a new technology is a very long time. We need to be able to anticipate what the most important rice diseases will be in the future. This future is shaping up even today: globalization leads to less agricultural labour being available in many places; globalization also leads some farmers to be growing rice crops for market niches, and in new production systems and rotations with yet unknown overall behaviour; on the other hand, climate change leads to less water being available for agriculture, to changes in temperature and rainfall patterns. All these are changing the face of agriculture. Since agricultural patterns, practices, and components are essential to explain the development of rice diseases, we must expect changes in rice health. These changes in the importance of rice diseases are already taking place. Some diseases may become more important, while others are declining. For instance field data collected by IRRI some 10 years ago already showed that changes in crop environments might lead to increase of rice blast (especially neck blast), of brown spot, and of sheath rot; the same data set across entire Asia, from hundreds of farmers fields, were also suggesting a slight decline of sheath blight, and a drastic reduction of stem rot.

Over the past few months, IRRI has developed a modeling approach which allows addressing any kind of rice diseases. This model can in turn be linked with global weather data in a worldwide geographic information system. This type of work can be very helpful in order to clearly identify what the priorities for plant pathologists should be. We anticipate linking this modeling work with climate change scenarios. Nevertheless, this will never replace entirely actual field observations, which are vital to assess the actual importance of rice diseases in farmers' fields. For instance, the emergence of diseases such as false smut, and possibly bakanae disease, are very serious concerns, for which we need more field information. More importantly, we must acquire basic knowledge on the biology of quite a few of the rice pathogens. False smut is one good example of such knowledge gaps; but there are gaps in other important diseases. Filling this knowledge gaps is vital for plant pathologists to better understand diseases, and thus develop reliable disease management strategies, including breeding programs. Future research in plant pathology needs to combine field observation, mathematical models, population genetics, geographic information systems, and modem molecular methods. This is a continuum in this field of science, which is not only necessary to make plant pathology relevant in the years to come, but also to render plant pathology appealing for the new generation of agricultural scientists, as well as, of course, provide satisfactory products that the farmers can easily use, and on which they can rely. In the end Dr. J. Kumar, Professor & Head Plant Pathology thanked Dr. Savary Professedly for the significant talk.

Dr. S. Savary delivering talk to scientists & students