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Genomics generates new insights into host plant defense and offers novel strategies for crop protection

Plant diseases and insect pests are the important threats to agricultural production and crop losses to diseases and insects can be greater than ~30% of the annual global production. Managing the health of crop plants to assure sustainable agricultural production can be very challenging. However, rapid advances in plant genomics are evolving our ability to analyze plant-pest interactions for a better understanding how host plants defend themselves against those attackers. In recent years, we have been developing and applying these sophisticated genomic tools to examine interactions between crop plants and pests to elucidate the genetic mechanisms of plant resistance and to fill the gap existing between genotype and phenotype of crop plants. Furthermore, the rapid development of high throughput technologies and the availability of immense amount of genomic and genetic data will provide system approaches for understanding and solving the remaining questions on host plant defense against attacking pests. This presentation reports the recent findings in the above mentioned research and demonstrates how genomics approaches can facilitate both the identification and use of resistance genes to diseases and insect pests and the development of novel resistant hybrids and varieties to achieve environmentally friendly crop protection and sustainable crop production.

Biography

Yinghua Huang is a Research Geneticist for US Department of Agriculture and serves as the Lead Scientist for the Plant Genetics Program. He has served as Faculty Member for Oklahoma State University for ten years and remains an Adjunct Professor at the university. He is a Member of Editorial Boards for several scientific journals. He has earned his PhD in Biological Sciences from Michigan Technological University. His scientific background is in plant genetics and molecular biology and he has considerable research experience in plant biotechnology, genomics and crop improvement. The overall goals of his research are to conduct basic studies to enhance our understanding of biological processes in plants, to apply newly developing genomics and biotechnologies to facilitate genetic improvement of crop plants and finally to improve the production system for a better utilization of agricultural and natural resources.

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