Crop Breeding for Sustainable Agriculture and Food Security in the face of Climate Change

Molly Jahn

University of Wisconsin-Madison, E-mail: mjahn@cals.wisc.edu

The twentieth century saw remarkable growth in agricultural productivity as a consequence of successes in plant breeding and supporting technologies and agronomic practices. The last century closed with growing awareness of the possibility of yield plateaus in major cereal crops, unintended consequences of agriculture and unsustainable resource use. As we enter the 21st century, plant breeding investments remain a focal point of our strategy towards global food security and continued gains in crop productivity. We must achieve these goals in the face of rapidly increasing human population and climate change producing generally warmer temperatures and more frequent extreme weather. In addition to gains in yield potential and nutritional content, we understand that we will need to accelerate our progress towards abiotic stress tolerance including crop nutrition and to prepare for new patterns of biotic stresses. It is estimated that agriculture may account for approximately 1/3 of global greenhouse gas emissions. If we are to stabilize our planetary climate, mitigation of climate change in our agricultural systems will require further innovations in crop improvement and our food systems. I will describe the challenges that lie ahead as we aim to bring our agricultural practices towards balance with our planet's ecological and physical boundaries that contribute to planetary stability, food sufficiency and global health.