

2nd International Conference on

PLANT SCIENCE & PHYSIOLOGY

June 26-27, 2017 Bangkok, Thailand



M Anowarul Islam

University of Wyoming, USA

Understanding plant diversity and physiology for resilient production systems and environmental benefits

Forage crops play a major role in the nation's economy, especially in the economy of the western states of USA due to presence of vast grasslands. However, forage yields in these states have been declining. For example, in Wyoming, forage yields are below the national average over the past few years. There are a number of factors that contribute to this low productivity and sustainability. Examples include declining plant diversity, reduction of biodiversity, less adapted plant species, monoculture practices, and soil degradation, especially soil mining. Many studies conducted locally, regionally, and internationally suggest that maintaining plant diversity with adapted species is important for the productivity, efficiency, and resiliency of grassland production systems. For instance, a recent extensive review shows that mixtures of species produce an average of 1.7 times more biomass than species monocultures and are more productive than the monoculture. Also, it is shown that, in some experiments, diverse polycultures achieve greater biomass than their single most productive species. The net effect of diversity and the probability of polycultures are more productive than their most productive species which increases through time. This occurs because of the magnitude of complementarity which increases when the experiments are run for a longer time. Also, it is shown at eight European field sites, a simulated study by synthesizing grassland communities with different numbers of plant species, that there is an overall log-linear reduction of average aboveground biomass with loss of species. Field studies being conducted at different locations in Wyoming demonstrate that mixtures (binary or polycultures) produce more biomass with high quality compared to monoculture. There are also positive impacts of mixtures on stand persistence, soil properties and environment, microbial population, and economic returns. Details about plant diversity and its impacts will be discussed in the presentation.

Biography

M Anowarul Islam is currently working as an Associate Professor at the Department of Plant Sciences of University of Wyoming, USA. His research and outreach activities aim to develop modern and innovative research and outreach programs on Agronomy that includes: germplasm search and evaluation for selection/cultivar development; establishment and Best Management Practices (BMP) for profitable and sustainable crops and livestock production; grazing management and integration with cropping systems; establishment and incorporation of legumes (e.g., alfalfa, sainfoin, birdsfoot trefoil; cicer milkvetch, medics) into the grass systems; alternative/multipurpose use of forages, e.g., bioenergy crops (switchgrass), specialty crops (fenugreek, quinoa, chick pea), small grains; forage nutritive value and seed production. Additionally, he teaches courses (Forage Crop Science, Thesis Research, Dissertation Research, Research Apprenticeship, and Research in Crops) and advises undergraduate and mentors graduate students.

mislam@uwyo.edu

Notes: