Agronomic crops are produced across a variety of landscapes and climates and changes in climate influence production efficiency and potential greenhouse gas emissions and sequestration. Studies that reported the effects of different crops to climate change demonstrated the variation in responses, and the interactions among natural components, e.g., water, soil, and temperature, to the degree of the response. Similar research efforts, however, are needed to provide a baseline for the response of agricultural and forestry systems to greenhouse gas change is providing valuable information to help guide decision making. If we continue to build on our information base to guide decisions, it will be possible to continue to make progress in reducing greenhouse gas emissions.

This special issue represents a cross-section of the most outstanding papers presented at the 4th USDA Greenhouse Gas Conference. These papers have been peer-reviewed by outstanding scientists and are presented as part of the cutting edge research provided by the conference. A critical component of this conference was the description of technologies with a potential of reducing greenhouse gas emissions and discussion of the effectiveness of these technologies. Without the development and evaluation of these technologies, these efforts will not progress to being potentially applied to different systems. However, they are often difficult to be directly linked with public policy. These issues have to be improved with the economic and social implications of different scenarios and technologies. Without the continued exchange of information, it will be impossible to continue to make progress in reducing greenhouse gas emissions.

The conference requires the efforts of many individuals to continue this special issue would not have been possible without the dedication and hard work by John Baker and Tim Parkin who served as Associate Editors in this process and revisions for these papers. A special thanks goes to the Symposium Steering Committee, the conference Chair, USDA ARS National Soil Tilth Lab., Ames, IA. 84322-4105. The conference requires the efforts of many individuals and a special thanks goes to the Symposium Steering Committee.