With the growth of the world's population and excessive use of fertilizers, the problems of food security and water scarcity have become increasingly severe. This poses higher challenges and requirements for sustainable agricultural development. Irrigation and fertilization play an indispensable role in many agricultural measures, while also affecting crop yield, soil organic carbon, nitrogen fate, non-point source pollution, and greenhouse gas emissions. Therefore, it is necessary to develop new irrigation and fertilization measures and to evaluate their advantages, disadvantages, and applicability through experimental and modelling methods. This Special Issue publishes papers of international significance relating to the mechanism, experimental results, and modelling of achieving sustainable agriculture through managing irrigation and fertilization. In all cases, manuscripts must address implications and provide insight regarding sustainable agriculture by irrigation and fertilization.