



Tropentag, September 18-21, 2016, Vienna, Austria

“Solidarity in a competing world —  
fair use of resources”

## Climate Impact Analysis and Adaptation Strategies to Climate Change on Peanut in Senegal

BABACAR FAYE<sup>1</sup>, HEIDI WEBBER<sup>2</sup>, THOMAS GAISER<sup>2</sup>

<sup>1</sup>*University of Cape Coast, West African Science Service Center on Climate Change and Adapted Land Use (WASCAL), Ghana*

<sup>2</sup>*University of Bonn, Inst. Crop Sci. and Res. Conserv. (INRES), Germany*

### Abstract

Climate change is projected to bring drier conditions to the western Sahel region, together with an increase of temperature and carbon dioxide (CO<sub>2</sub>).

Our study was conducted in a part of this sub regional, assessed the impacts of climate change on peanut yield and proposed adaptation strategies for two sites in Senegal. Moreover, the effects of CO<sub>2</sub> variation on crop growth and yield were quantified under different climate change scenarios for four regional climate models. Biomass and seed yield were simulated for a present climate (1981-2010) and RCP4.5 and RCP8.5 scenarios (2016-2045) under dry season and rainfed conditions with and without irrigation. It was found that projected climate change without CO<sub>2</sub> elevation may impact negatively both biomass and seed yield for RCP4.5 and RCP8.5 in both seasons. For biomass the maximum change goes up to -12% for RCP4.5 and 15% for RCP8.5. While for seed, it goes up to -42.1% for RCP4.5 to -55.8% for RCP8.5. However, positive yield changes result when CO<sub>2</sub> concentration increase from 369 ppm to 439 ppm for RCP4.5 and 469 ppm for RCP8.5 for the scenario period of up to 5.4% and 12.4% for RCP4.5 and RCP8.5 respectively for biomass and for seed yield up to 9.6% for RCP4.5 and 13.2% for RCP8.5.

Under dry season conditions, where maximum air temperature are often higher than 36°C at these sites, the negative effects of climate change is greater than during the rainy season where maximum air temperature is typically lower than 35°C when air temperature is used in simulations. In addition, it was found that the greater the maximum air temperature is, the more the negative effects on yield record the higher values with is due to heat stress. Current sowing dates, in both sites, led to improved yield levels under climate change. Furthermore, short season varieties had greater relative yield changes and can therefore be recommended as adaptation strategy in these two sites to cope with the impact of early rain cessation. It is concluded that climate change will have positive impact on peanut yield in Senegal due to the elevated of CO<sub>2</sub> together with shorter season varieties.

**Keywords:** Adaptations, climate change, peanut, Senegal