

## **Abstracts**

### **Performance of a climate change - resilient agronomic package for chilli (*Capsicum annuum* L.) in comparison to the existing crop management in the Northern Province of Sri Lanka**

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Adapting cropping systems to the potential negative impacts of climate change by enhancing their resilience has become important especially for the farming communities in vulnerable regions like Northern Province of Sri Lanka. Increased ambient temperatures, altered rainfall patterns, declining soil fertility and changed pest/ disease dynamics are critical challenges of climate change on crop production. To address these challenges, a climate change-resilient agronomic package (adaptation package) that includes mulching to conserve soil moisture, integrated pest management for crop protection and site specific fertilizer application for efficient crop-soil nutrient management was formulated through a multi-locational, on-station field study across an increasing temperature and decreasing rainfall gradient and tested on chilli in farmer fields located in three upland cropping sites in the Northern Province of Sri Lanka. The sites were Nilavarai (N) in Jaffna District and Thiruvaiyaaru (T) and Mulankavil (M) in Kilinochchi District. The experiment consisted of two treatments as climate change-resilient agronomic package (T<sub>1</sub>) and existing farmer practice (T<sub>2</sub>). Existing farmer practice is characterized with heavy reliant on chemical control of pests and diseases and application of

inorganic fertilizers subsequent to decisions of farmer. The two treatments were imposed in a randomized complete block design where the selected farmers in each location were considered as blocks. Number of farmers was eight, four and three and the experimental period was end of October 2013 to early April 2014, end of January 2014 to end of June 2014 and mid-March 2014 to mid-August 2014 respectively in the sites of N, T and M. Crop biomass and green chilli yield were measured at harvest. Incidences of major diseases (i.e. chilli leaf curl complex and fungal wilt) were observed at the different phenological stages of chilli. Soil chemical properties were measured at the beginning and end of the season. The results showed key benefits in terms of growth and yield improvement, suppression of observed diseases and improvement of soil organic matter and available macro nutrients under the adaptation package. The adaptation package showed yield increases of 22.4%, 21.4% and 16.2% over the existing farmer practice at N, T and M respectively. Even though the adaptation package had a slightly greater cost, this was outweighed by a substantially greater income. Hence, this adaptation package could be recommended for adoption by the farmers to improve the yield of chilli while promoting lower water and agro-chemical use and having increased resilience to climate change.

**Keywords:** Adaptation package, Chilli, Climate change-resilient, Farmers, Northern Province.