Modelling the Climate Sensitivity of Proso Millet in Sri Lanka

Prepared By : Eranga M. Wimalasiri
Supervised By : Dr. Matthew Ashfold, Dr. Asha S. Karunaratne, Prof. Sue Walker, Dr. Sean Mayes

Introduction

Proso millet (*Panicum miliaceum* L.) has been known for many thousands of years in Eastern Asia and is still extensively cultivated in several countries throughout the world.

Astonishingly low water requirement and the tolerance to harsh conditions make proso millet a successful crop under future climate scenarios, since the climate change is taking place in Sri Lanka both in terms of rainfall variability and an increase in climate extremes and warming.

Aim

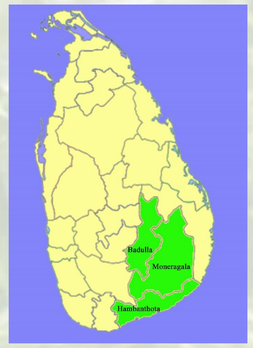
Quantitative analysis of the current status and the sensitivity of Proso millet production to changing climate through crop-climate modelling.

Specific Objectives

1. To evaluate quantitative relationships between specific physiological process and the climate
1. To calibrate and to evaluate APSIM crop model for Proso millet.
1. To use Coordinated Climate-Crop Modelling Project (C3MP) methodology to evaluate sensitivity to climate variability in Sri Lanka using calibrated APSIM model.
1. To make projections under future climate scenarios across growing regions in Sri Lanka.

Research Methodology

1. Collection and evaluation of genetic diversity of Sri Lankan Proso millet
2. Selection of lines through phenotypic and genotypic screening
3. Calibration – using selected lines
4. Validation – farm field data
5. Proso millet production projections

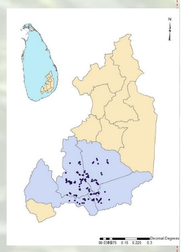


Germplasm collected districts

Progress so far..

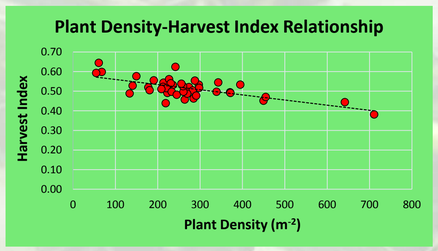
Farm field observation

- Familiarization of agronomy, botany, growth and development
- 41 Farms – Thanamalwila, Sri Lanka (6^0 43’ North, 81^0 13’ East) - Low country Dry Zone (DL_{1b})
- Growing season - Late March to early June 2015
- Farm survey and yield analysis



Location of Farm Fields

Results



Harvest index is negatively correlated with the plant density.

References

Karunaratne, A.S., Walker, S. and A.C. Ruane (2015). Modelling Bambara groundnut in southern Africa towards climate resilient future, Climate Research, *Climate Research* doi 10.3354/cr01300
Karunaratne, A.S. and Wheeler, T.R. (2015). The observed relationships between maize yield and climate in Sri Lanka, *American Journal of Agronomy*, 107:395–405.