Abstract No: 397 ***Climate and Environment***

EVALUATION OF SELECTED CLIMATE-ADAPTIVE CROP AND SOIL MANAGEMENT PRACTICES FOR MUNG BEAN *VIGNA RADIATA* (L.) WILCZEK, IN THE MID-COUNTRY INTERMEDIATE ZONE OF SRI LANKA

S. Kajenthini[1], J.B.D.A.P. Kumara[2] and W.A.J.M. De Costa[1]*

[1]Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka
[2]Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka
**janendrad@gmail.com*

Mung bean (*Vigna radiata* (L.) Wilczek) is a versatile crop which is used in maize-legume crop rotations in uplands and in the rice-legume crop rotation in lowlands in the dry and intermediate zones of Sri Lanka. Climate change and intensive use of synthetic agro-chemicals are problems in the production of any crop including mung bean. Adaptation measures are required to reduce the above constraints. Therefore, the objective of this study was to quantify the impacts of a selected set of adaptation systems on growth, biomass partitioning, yield and nutrient uptake of mung bean.

A field experiment was conducted at the University Experimental Station, Dodangolla, Kundasale during the *maha* season of 2013/14. The experimental treatments consisted of five cropping systems as following: (a) Control (T1) - Standard water and nutrient management and crop protection; (b) Adaptation System 1 (T2) - Low water input combined with moisture conservation via mulching along with other standard practices; (c) Adaptation System 2 (T3) - Adaptation System 1 modified with integrated pest management (IPM) for crop protection; (d) Adaptation System 3 (T4) - Adaptation System 2 modified with 25% of the crop nitrogen requirement supplied with an organic amendment (*i.e.* compost) and (e) Adaptation System 4 (T5) - Adaptation System 3 Intercropped with maize.

The intercropping system (T5) showed significantly greater total biomass than the rest (T1–T4), which did not differ significantly, from 4 weeks after planting (4 WAP) onwards. The respective crop growth rates during the linear phase (4–6 WAP) of the growth curves were: T1-8.41 g m^{-2} d^{-1}; T2-7.64 g m^{-2} d^{-1}; T3-5.86 g m^{-2} d^{-1}; T4 - 7.21 g m^{-2} d^{-1} and T5- 11.69 g m^{-2} d^{-1}. Grain yield of all monocropping systems (T1–T4) did not vary significantly. However, mung bean yield of the intercropping system (T5) was 33.1% lower because of its 46% lower plant density than in the monocrops. Nevertheless, this will be complemented by the maize yield later in the season. Total uptake of N, P and K was significantly greater in T1 and T4 than the rest. However, T5 showed the highest nutrient uptake efficiency (NUpE) and nutrient use efficiency (NUE) for all three nutrients whereas T2 had the lowest. T4 showed the second highest efficiency for N and K whereas T1 showed the second highest efficiency for P.

In view of the absence of significant yield variation between the standard system and the different adaptation systems, it can be concluded that any of the adaptation systems can replace the currently-practiced system without a yield penalty. Out of the different adaptation systems, T4 (mulching + IPM + 25% of N given as compost) and T5 (maize-mung bean intercrop with all adaptations of T4) can be recommended because of their higher efficiencies of nutrient uptake and nutrient use and the lower use of inorganic fertilizer and synthetic agrochemicals.