229/B

Intensification of upland crop production in Anuradhapura district through agro- climatic approach

M K N Kumari[1*], C M Navaratne[1]
[1]*Department of Agricultural Engineering, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka*

As water is a major limiting factor that affects for upland crop production (Vegetables) in Anuradhapura district, a study was conducted to find the optimum cropping calendar that require least amount of irrigation water. The analysis was carried out using daily rainfall data for 35 years (1971 – 2005) at different rain gauge stations, namely Anuradhapura, Mahailluppallama, Nochchiyagama, Kalawewa, Elayapaththuwa, Padaviya and Vavuniya. Pan evaporation data at Mahailluppallama Meteorological Station was also used for the analysis.

Hargreaves Moisture Availability Index (MAI) and 10 mm weekly rainfall at 75% probability level were used to find rainfall onset in each station. Probability level was reduced in above mentioned methods, as wet weeks couldn't be identified during *yala* season when the probability level exceeds 75%. Based on forward accumulation of rainfall method, the date, which accumulates 100 mm of rainfall after a dry period, was taken as the crop commencement date for upland crops. A field survey was conducted to find the existing crop establishment time. The irrigation requirement for upland crops, when they are established on the weeks, which were found by the above mentioned methods and by field survey was determined using CROPWAT software program.

Hargreaves MAI at 60% probability dependable rainfall and 10 mm weekly rainfall at 55% probability was identified as the suitable probability levels for rainfall onset identification. The crop establishment date found by 10 mm weekly rainfall and MAI method recorded the least irrigation requirement for upland crops compared to forward accumulation and farmer practiced methods. The crop establishment week which reports the least irrigation requirement was selected as the optimum crop establishment time for both *yala* and *maha* seasons. Optimum crop commencement time and irrigation requirements for upland crops was 14th week, 241.3 – 306.4 mm and 37th – 43rd week, 0.0 – 38.4 mm for *yala* and *maha* seasons respectively. 37% and 82% of irrigation water could be saved in *yala* and *maha* seasons respectively for upland crops, when crops are established on optimum planting time compared to existing crop establishment time.

*nadee_maya@yahoo.com Tel: 041-2292200