

## **EVALUATION OF OPTIMUM BASIN SIZE WITH DIFFERENT FLOW RATES TO IRRIGATE UPLAND BASINS IN NON CALCIC BROWN SOIL**

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Basin irrigation is the most common form of surface irrigation method used by the farmers in low country dry zone areas in Sri Lanka. With increasing water scarcity problems in these areas, farmers need to work with higher water use efficiency to cultivate more lands with existing water resources. Efficiency of basin irrigation basically depends on nature of the basin and flow rate, therefore it is vital to identify optimum basin dimensions and flow rates. A field study was conducted at Regional Agricultural Research and Development Center, Aralaganwila, Sri Lanka during 2012 *Yala* season to identify optimum basin size and flow rates for non-calcic brown (NCB) soil. Moisture retentions in different depths as 0-15 cm, 15-30 cm and 30-45 cm in different basin sizes (12 m x 10 m, 10 m x 12 m, 10 m x 10 m, 10 m x 8 m, 8 m x 10 m, 8 m x 8 m, 6 m x 6 m) with different flow rates (0.73 ls<sup>-1</sup>, 3.3 ls<sup>-1</sup> and 5.5 ls<sup>-1</sup>) were examined and application efficiencies with different basin sizes and flow rates were calculated. Results revealed that, basin size of 8 m x 8 m recorded significantly higher moisture retention compared to other basin sizes. Moisture retention showed insignificant variations for both flow rates and depth classes. Flow rate of 0.73 ls<sup>-1</sup> recorded significantly higher application efficiency compared to other flow rates. Application efficiency showed insignificant differences among the basin sizes. This study identified, 8 m x 8 m as the optimum basin size and flow rate of 0.73 ls<sup>-1</sup> as the optimum flow rate to irrigate upland basins in NCB soil. Further studies on different basin sizes and flow rates are suggested to confirm these results since this study encountered numerous problems due to seepage and rainfall.

**Key words:** Application efficiency, Basin irrigation, Moisture retention, Optimum basin size, Optimum flow rate