

**Purpose:** Water saving practices are crucial for crop production in drought prone areas. This study was conducted in Bugesera District, in the Eastern Province of Rwanda. The objective was to determine the effect of irrigation levels and mulching types on growth and yields of beans.

**Methodology:** A split plot experiment consisting of three irrigation levels as main plots and three mulching types (no mulch, grass mulch and plastic mulch) as subplots, in a Randomized Complete Block Design (RCBD), with three replications was conducted. Climbing bean, Mac 44 variety, was planted at 50 cm × 20 cm spacing. Different levels of irrigation and mulching were applied from 3 weeks after crop emergence. Irrigation water was applied using a manual watering can.

**Findings:** Bean height and grain yield varied significantly due to the combined effects of irrigation × mulching. Highest value of plant height, 100 grain weight and yield value were obtained under the combination of 50% irrigation level with grass mulch. Compared to the control, yield improvement of 83%, 100 grains weight improvement of 39% and plant height increase of 20 % were observed under I<sub>1</sub>M<sub>1</sub>. Significant and positive correlations were observed between yield, plant height and yield parameters. The observed interdependence of yield parameters is illustrated by the positive and significant correlation between these parameters. Combining irrigation and mulching would improve climbing production while saving irrigation water up to 50%.

**Recommendation:** Both plastic and grass mulch gave similar results, however grass mulch is recommended for climbing bean production in the study area due to its additional advantages over the plastic mulch.