Abstract

Climate change and unpredictable rainfall patterns pose significant challenges to sustainable agriculture, underscoring the need for climate-smart, innovative technologies that enhance productivity and environmental resilience. Taro [Colocasia esculenta (L.) Schott] is a high-value superfood; however, its production in Kenya remains limited due to limited farmland, basic planting techniques, and a severe shortage of propagation materials. Taro [Colocasia esculenta (L.) Schott] is a high-value superfood; however, its production in Kenya remains limited due to limited farmland, basic planting techniques, and a severe shortage of propagation materials. Traditionally, taro is grown in wetland ecosystems; as such, the potential of taro is underutilized and ignored, therefore hindering its expansion into upland cropping systems and meeting the increasing demand. This study examines moisture pits as a climate-adaptive strategy to enhance upland taro production by optimizing water harvesting and conservation. This study examines moisture pits as a climate-adaptive strategy to enhance upland taro production by optimizing water harvesting and conservation. Field experiments conducted in 2023 and repeated in 2024 at Egerton University assessed the impact of varying planting depths on taro tuber yield and its components. A randomized complete block design with four replications was used, incorporating pit depths of 20, 30, 45, and 60 cm. Data collected focused on shoot parameters, corm yield, and yield components. Results indicated that planting depths significantly influenced corm weight per plant, with weights of 2.67 kg for 60 cm, 2.02 kg for 45 cm, 1.24 kg for 30 cm, and 0.35 kg for 20 cm. Corm yields also differed significantly: 44.63 t ha-1 at 60 cm, 38.43 t ha-1 at 45 cm, 29.58 t ha-1 at 30 cm, and 7.54 t ha-1 at 20 cm. The study concluded that the depth of planting pits significantly impacts the yield of upland taro, with deeper pits yielding better results. It is recommended that farmers adopt 30 cm wide and 30 to 60 cm deep pits for improved yields and high-density planting of suckers.