

Abstract

Purple passion fruit (*Passiflora edulis* f. *edulis* Sims.) is an important fruit in the juice industry but its yields can drastically decline under drought stress. The present study evaluated the effects of irrigation and mulch on drought stress amelioration in purple passion fruits. The experiment was set up in a rain shelter in randomized complete block design, replicated four times and repeated once. The study had four irrigation rates (2.5, 5, 10 and 20 L/plant) and three mulches (black plastic film, wheat straw and none). Each treatment had 12 plants in 45cm x 45cm holes spaced at 1.5m x 1.5m and trellised onto posts and wires. A trench lined with plastic film prevented water seepage across treatments. Plants were maintained uniformly until the fifth week when treatments were imposed. Data were recorded up to 56 weeks after planting (WAP) and subjected to analysis of variance using the SAS software. Irrigation significantly increased fruit number at 52 WAP only, and fruit weight at 48, 52 and 56 WAP. The effect of irrigation on cumulative fruit weight (6016 g/plant) for 20 L was significantly ($P < 0.05$) greater than the 5052 g/plant for 2.5 L. Black plastic mulch significantly increased fruit number and weight at 43 WAP only. Irrigation and mulch did not significantly ($P > 0.05$) affect passion fruit quality traits which were nevertheless within standard magnitudes. Generally, when irrigating with over 5 L, there was no additional benefit of mulching but mulch ameliorated drought stress when deficit irrigation (2.5 L) was applied. Wheat straw and 10 L/plant once per week is generally optimal and should be used in mitigating drought stress to enhance purple passion fruit yields. Irrigation is more effective in enhancing passion fruit yield than mulching and hence it should be given first priority.