SUSTAINING AND IMPROVING WHITE PITAYA PRODUCTION UNDER ABIOTIC STRESS ENVIRONMENTS: A CASE STUDY IN PENGHU, TAIWAN

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ABSTRACT

Pitaya (Hylocereus sp.) is generally regarded as a crop with high tolerance to environmental stresses. To meet the self-sufficiency market in Penghu County, an archipelago in the Taiwan Strait with dry and high-irradiance climate, pitaya has recently been grown in the area. However, a suitable cultivation model for sustaining and improving its production still needs to be established. The phenology and effects of flowers and fruits thinning, fruit bagging and shading of the plants' quality and maintaining shoot growth have been evaluated in nine-year-old white pitaya (H. undatus) field grown plants in Magong, Penghu from 2008 to 2010. The harvest season in Penghu is from late July to November. Yield reaches its peak from September to October, the period which is approximately 1-2 months later compared to the peak season in southern Taiwan. The fruit weight is smaller compared to those produced in Taiwan Island and has an average weight of 345 g. The largest fruits are produced in October but these have the lowest total soluble solid content. Thinning flower buds and fruits did not significantly improve both the whole plant yield and the fruit quality, possibly due to the dry climate and saline soil which limit the development of the fruit. A non-woven fabric bag that was covered in a gray plastic film produced the best red color in both the exposed and shaded side of the fruit, leading to its uniform coloration. In addition, the bags did not affect the remaining characteristics and increased the incidence of the fruits’ sooty molds disease. To protect the plants from damage caused by extremely high solar radiation in summer, a 50% shading of net covered above the plant canopy from June to September was found to effectively reduce sun burn and necrosis, and kept the shoots green. Although shading slightly reduce the yield, it did not affect the fruit quality.