Efficacy of kaolin and salicylic acid in reducing heat stress damage and enhancing yield of dragon fruit

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ABSTRACT

Dragon fruit holds high economic value due to its rich nutrition and growing export demand throughout the world. However, sunburn caused by high temperatures and intense solar radiations is a major constraint, leading to yellowing, bleaching, rotting and drying of cladodes, poor growth, higher disease susceptibility, and yield loss. To mitigate this, foliar sprays of kaolin (4%, 6%, 8%), salicylic acid (SA, 300 ppm), and their combinations were evaluated, with water spray as control. Among treatments, 8% kaolin was most effective, reducing sunburn incidence and severity in April (65.63% SI, 22.08% SS) and May (57.29% SI, 23.75% SS), and lowering disease incidence (32.42%) and severity (13.96%). It also improved physiological traits including new shoot emergence (14.00), chlorophyll (3.25 mg/g FW), and NDVI, as well as reproductive traits such as buds (92.00), flowers (76.00), and fruits (48.33). The 4% kaolin + SA treatment enhanced fruit set (91.23%). Highest yield (15.77 kg/plant; 15.01 t/ha) was recorded with 8% kaolin, with SA also contributing positively. Kaolin sprays enhanced phenols and flavonoids, while 6% kaolin improved vitamin C (45.68 mg/100 g). Overall, 8% kaolin effectively mitigated heat stress by reducing sunburn and disease, while SA, though less effective against disease, significantly boosted yield alone or with kaolin.

***Keywords**:* Kaolin, salicylic acid, sunburn management, yield.