***Design and Development of an Off-Grid Solar Power System to Stimulate Dragon Fruit Flowering***

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# *ABSTRACT*

*The main problem in dragon fruit cultivation in Indonesia is the low productivity during the off-season, which leads to high prices and limited supply. One effective solution is to provide artificial lighting using LED lamps at night to stimulate flowering. However, using electricity from the national grid (PLN) is costly and difficult to implement in farms located far from power lines. This study aims to design and build an off-grid Solar Power Plant (PLTS) as an alternative energy source for dragon fruit illumination. The experimental method was applied to construct a PLTS system consisting of four 250 Wp monocrystalline panels, four 12 V 100 Ah lead-acid batteries, an MPPT solar charge controller, and a 2000 W pure sine wave inverter. The test results show that the system successfully generated a total capacity of 4.8 kWh and was able to power sixteen 9 W LED lamps for seven hours each night. Field observations indicated that the off-grid PLTS system effectively stimulated dragon fruit flowering during the off-season while reducing fossil fuel use and conventional electricity costs.*

***Key words****: dragon fruit, flowering, off-grid PLTS, renewable energy, solar energy.*