

# UJI TERBANG UAV PENYEMPROT TANAMAN BERBASIS *QUADCOPTER*

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## ABSTRAK

Selama ini, proses pemupukan dan pembasmian hama dilakukan dengan cara manual dengan luasan area pertanian yang relatif luas. Kegiatan ini kurang efektif dilakukan. Oleh sebab itu, muncul sebuah ide untuk membuat sebuah pesawat tanpa awak (UAV) penyemprot tanaman berbasis Quadcopter. Quadcopter SPRAYER AMF-16 IF ini dirancang untuk mampu terbang dengan membawa 3 kg cairan, dengan total berat take-off 8 kg.

Untuk mendapatkan produk yang siap digunakan secara umum, maka perlu dilakukan pengujian terlebih dahulu. Dalam pengujian ini digunakan 4 buah motor brushless SunnySky X3520 720 KV, 4 buah propeller Gemfan 13x6,5 APC Style Carbon Fiber, 4 buah ESC SkyWalker 80A, Battery LiPo 6S 4500mAh 22.2V serta flight controller Pixhawk 2.4.8.

Setelah dilakukan peroses pengujian dan perhitungan, maka didapatkan selisih endurance dan range, selisih endurance dalam kondisi membawa payload pada kecepatan 2 m/s sebesar 34% dan pada kecepatan 2,5 m/s sebesar 33%. Sedangkan dalam kondisi tanpa membawa payload selisih endurance pada kecepatan 2 m/s sebesar 54% dan pada kecepatan 2,5 m/s sebesar 57%. Selisih range dalam kondisi membawa payload pada kecepatan 2 m/s sebesar 13% dan pada kecepatan 2,5 m/s sebesar 30%. Sedangkan dalam kondisi tanpa membawa payload selisih range pada kecepatan 2 m/s sebesar 65% dan pada kecepatan 2,5 m/s sebesar 72%.

***Kata kunci: UAV, Quadcopter SPRAYER AMF-16 IF, uji terbang, range, endurance.***

# TEST FLIGHT UAV SPRAYING PLANT *QUADCOPTER-BASED*

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## **ABSTRACT**

*During this time, the process of fertilization and extermination of pests is carried out by manual with a relatively large area of agriculture. This activity is less effective. Therefore, an idea emerged to make an unmanned plant spraying drone (UAV) based on Quadcopter. The SPRAYER AMF-16 IF Quadcopter is designed to be able to fly with 3 kg of liquid, with a total take-off weight of 8 kg.*

*To get a product that is ready for use in general, it is necessary to test first. In this test, 4 SunnySky X3520 720 KV brushless motors, 4 Gemfan 13x6.5 APC Style Carbon Fiber propellers, 4 SkyWalker 80A ESCs, 6S 4500mAh 22.2V LiPo Battery and a Pixhawk 2.4.8 flight controller were used.*

*After testing, the distance that the AMF-16 SPRAYER UAV has successfully covered is 220 m (0.22 km) with a coverage area of 500 m<sup>2</sup> and endurance without carrying a Payload at a speed of 2 m/s for 2 minutes 24 seconds and at a speed of 2.5 m/s for 2 minutes 16 seconds, for endurance with a load at a speed of 2 m/s for 3 minutes 11 seconds and at a speed of 2.5 m/s for 3 minutes 17 seconds. Meanwhile, based on the calculation of the range value at a speed of 2 m/s 252,216 meter, for an endurance value of 126,108 seconds (2,1018 minutes).*

*After testing and calculation process, the difference in endurance and range was obtained, the difference in endurance in conditions of carrying a payload at a speed of 2 m/s is 34% and at a speed of 2.5 m/s is 33%. While in conditions without carrying a payload, the difference in endurance at a speed of 2 m/s is 54% and at a speed of 2.5 m/s is 57%. The range difference in conditions carries the payload at a speed of 2 m/s is 13% and at a speed of 2.5 m/s is 30%. While in conditions without carrying payload range difference at a speed of 2 m/s is 65% and at a speed of 2.5 m/s is 72%.*

**Keywords:** UAV, *Quadcopter SPRAYER AMF-16 IF*, test flight, range, endurance.