The Control & Computing System hardware consists of:

* **Flight Control System**

1. Pixhawk 2.4.8 (ARM Cortex M4, 6-axis gyroscope + accelerometer, barometer, compass, failsafe co-processor)
2. NEO-M8N GPS Module (Accuracy of 2m & 18 Hz update rate)

* **Flight Computing System**

1. Raspberry Pi Model 4 B (4GB RAM)
2. Raspberry Pi Night Vision Camera (5MP, 1080p)

* **Telemetry**

1. 433 MHz 500mW radio telemetry (2.5km range)

The hardware for control system is selected after detailed analysis of all available options in terms of cost, reliability & mission limitations. Control & Computing System, both are put inside UAV for two reasons:

1. **Complete autonomy of UAV:**

UAV is independent of any ground control station and can complete spraying mission outside range of telemetry with great precision.

1. **Advanced Computing & Artificial Intelligence:**

Using HD image processing, machine learning, advanced model-prediction algorithms & artificial intelligence on powerful quad-core Raspberry Pi, the on-board computing system makes this UAV the first of its type; out-performing any manned or unmanned agriculture drone in market.

**Flight Controller Software:**

Pixhawk runs modified ArduPilot firmware for quad tilt-rotor UAV with all 4 rotors tilting. Modifications in the firmware are made for optimum performance with our aerodynamic design. Modifications include:

* Vertical to Horizontal or Horizontal to Vertical Flight Transition with variable tilt-angle (enabling both time & energy optimization according to requirements)
* Drone stabilization by controlling all 4 tilting servos on independent PIDs (for optimum stability)