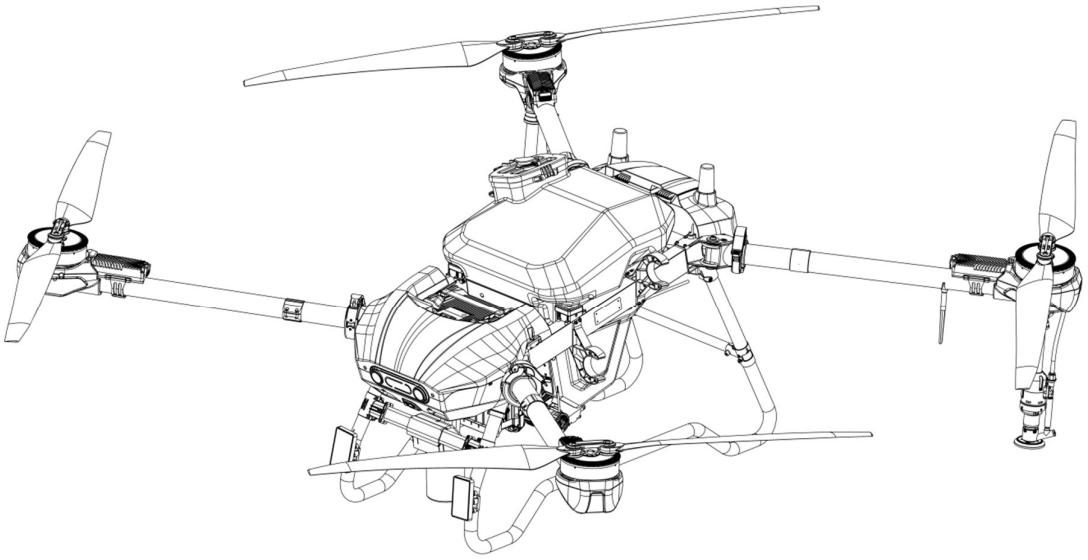
Agricultural Drone Instruction Manual

Crop Operation Guidebook

Version 1.0



VECTOR AGR

Overview of Operating Parameters

1. Common Agricultural Scenarios

(1) Pesticide Spraying

This operation is applicable to large field crops such as wheat, rice, corn, as well as economic crops planted in orchards and vegetable gardens. It is used for pest and disease control and foliar fertilization, enabling precise application of pesticides or fertilizers directly onto crops.

(2) Seed and Fertilizer Broadcasting

Suitable for sowing and fertilizing various farmland crops, including broadcasting seeds, chemical fertilizers, and organic fertilizers onto fields. This operation achieves precise fertilization and seeding, thereby improving labor efficiency.

2. Flight Parameters

(1) Flight Height

The typical operating altitude of the HD580 ranges from 3 to 11 meters. Among these, 3 to 5 meters is the most commonly used range. For example, during spraying or broadcasting operations on large field crops, the flight height is usually set between 3 and 7 meters. In orchard scenarios with taller plants, the flight height may be adjusted to around 7 to 11 meters to ensure pesticides or seeds are accurately applied to the target crops.

(2) Flight Speed

he HD580 has a maximum speed of 13.8 meters per second. However, during actual operations, a relatively lower speed is usually adopted to ensure uniform and effective spraying or broadcasting.

For example, when spraying pesticides, the flight speed generally ranges from 3 to 5 meters per second; when broadcasting seeds or fertilizers, the speed is typically between 4 and 6 meters per second.

3. Application Rate per Hectare

(1)Spraying Operations

1. **Standard Configuration with 2 Nozzles:** Recommended spray width is 8 meters, suitable for conventional spraying of large field crops such as wheat and rice, balancing efficiency and uniformity.
2. **Optional Configuration with 4 Nozzles:** Maximum spray width can reach 11 meters, ideal for open terrain or rapid coverage with high-concentration pesticides.

(2) Broadcasting Operations

3. **Conventional Broadcasting:** Effective spreading width is 10 meters, suitable for materials with particle sizes ranging from 0.5 to 10 mm such as chemical fertilizers and wheat seeds, equipped with a super-large flow rate of 300 kg/min.
4. **Precision Broadcasting:** By replacing the auger (e.g., with a small-sized auger), the spreading width can be reduced to 3 meters, meeting the precise delivery requirements for small particle materials like rapeseed and granular insecticides.

4. Parameter Synergy Optimization Logic

(1) Triangle Logic of Height, Spray Width, and Flight Speed

1. **Linear Adjustment Formula:** Operation Width (m) = Flight Height (m) × 1.5 + 2 (This formula applies within a flight height range of 3 to 10 meters.)

   For example, at a flight height of 5 meters, the theoretical spray width is 9.5 meters. In actual operations, this value should be fine-tuned based on wind speed (reduce by 10% if wind speed exceeds 5 m/s) and crop type.

2. **Efficiency Calculation Model:** Area covered per hour (hectare) = (Spray Width (m) × Flight Speed (m/s) × 3.6) ÷ 10,000

Example: With a spray width of 7 m and flight speed of 5 m/s, the operational efficiency is approximately 1.26 hectares per hour.

(2) Dynamic Balance Between Flow Rate and Application Rate per Hectare

1. **Spraying Scenario:** Application rate per hectare (L) = (Flow rate (L/min) × 60) ÷ (Spray width (m) × Flight speed (m/s) × 10,000)

   For example, with a flow rate of 30 L/min, spray width of 7 m, and flight speed of 5 m/s,

   Application rate per hectare = 30 × 60 ÷ (7 × 5 × 10,000) = 0.0514 L/ha

2. **Broadcasting Scenario:** Application rate per hectare (kg) = (Broadcasting flow rate (kg/min) × 60) ÷ (Spreading width (m) × Flight speed (m/s) × 10,000)

   For example, with a flow rate of 400 kg/min, spreading width of 10 m, and flight speed of 6 m/s,

   Aplication rate per hectare = 400 × 60 ÷ (10 × 6 × 10,000) = 0.04 kg/ha