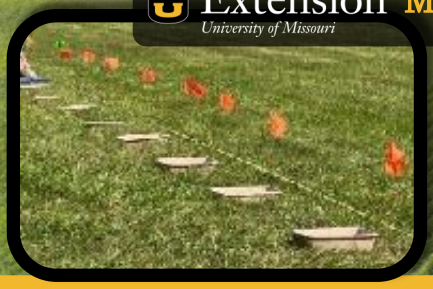
Northern Missouri Research, Extension & Education Center
University of Missouri
USDA Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

Utility Drones in Agriculture

Extension MX150
University of Missouri



Procedures for Drone Calibration and Worksheet for Evaluating Spreading Patterns

Gurbir Singh

WHAT'S NEEDED TO CALIBRATE A DRONE?

- Drone with calibration curve for selected seed
- Computer to plot spreading patterns
- Basic knowledge of Microsoft Excel
- Spread pattern test kit
- 200 lbs. of seed (Wheat in this example)
- Marking flags
- Measuring tape
- Weighing scale

WHAT'S THE DRONE CALIBRATION PROCESS?

1. Drone Set Up

- Set the flight height and speed constant (height to 10 ft above canopy, speed to 20 ft/sec).
- Set the spinner disk rotations to 1200 rpm.
- Set the drone to RTK mode.

2. Set Catch Pans (Figure 1)

- Determine the zero-point (middle of the swath).
- Place pans at 5-foot distances extending 30 feet in both directions (60 foot swath).
- Secure the catch pans with anchors (long wire flags were used in this example).

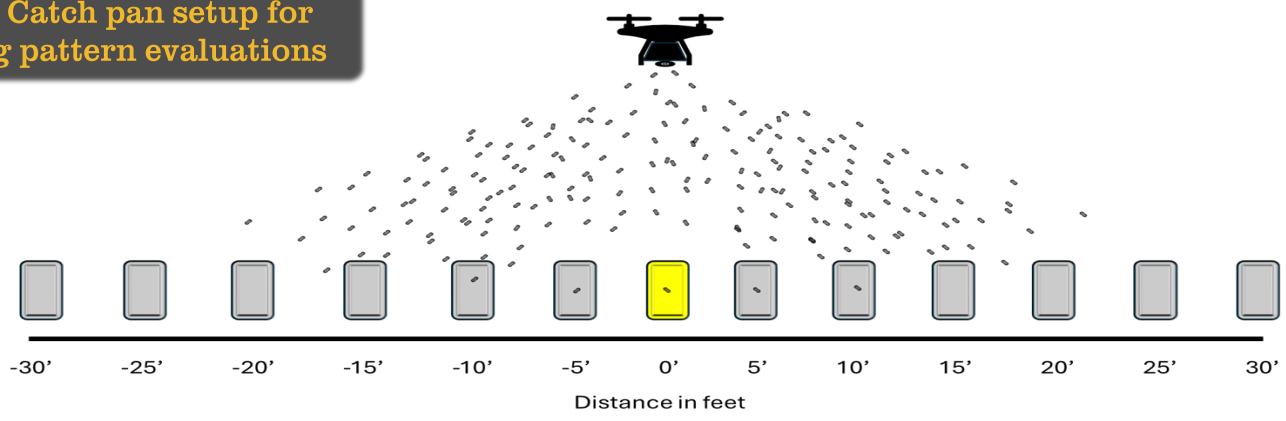
3. Flight

- Fly the drone 10 times over the zero-point line (Yellow pan in Figure 1).

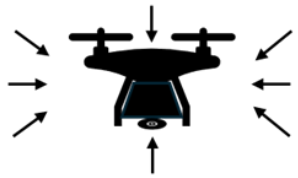
4. Collection and Analysis

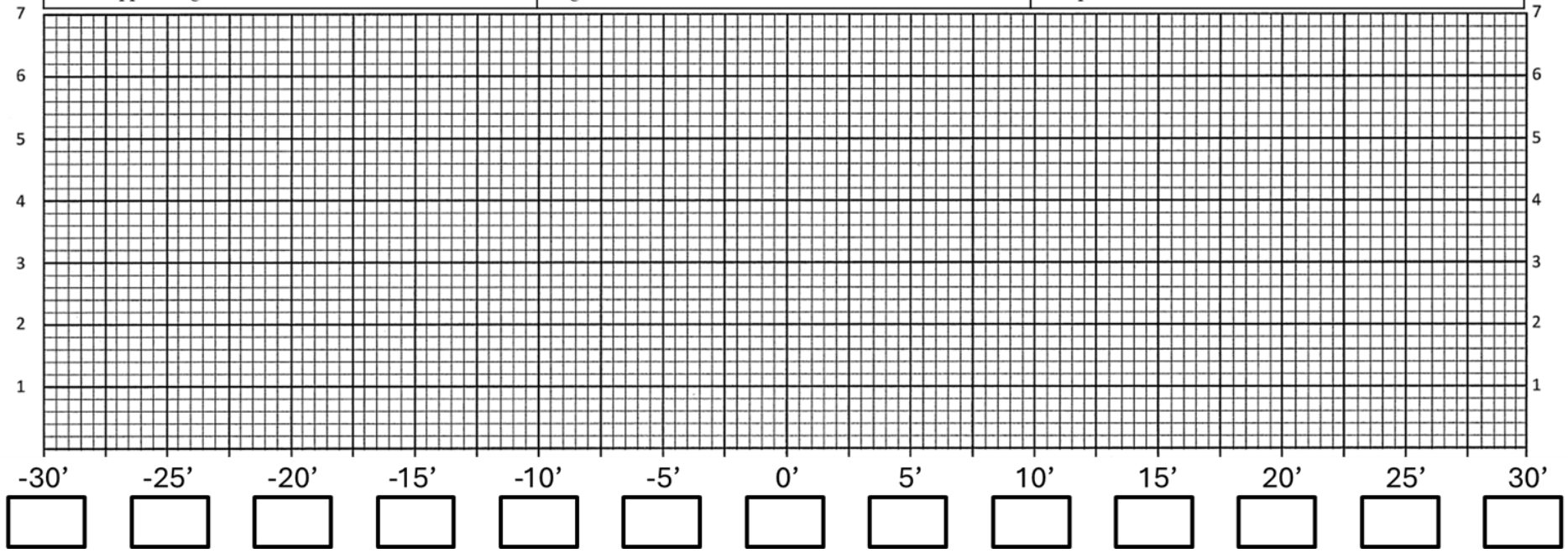
- Gather seeds in the provided tubes and label them properly.
- On the attached worksheet, record the weight of each tube in the boxes provided.
- Plot on the graph to determine spreading pattern shape.
- Use the total number or weight of seeds captured to develop a distribution curve in Microsoft Excel.

Figure 1: Catch pan setup for spreading pattern evaluations



DRONE SPREAD PATTERN DATA SHEET

DRONE SPREAD PATTERN DATA SHEET					
Pattern Test No.		Remote Pilot Name:		Circle direction of wind relative to the drone	
Site:		Drone Model:			
Date:		Serial No.			
Material Name:		Flight Height:	ft		
Density:	lbs/ft³	Flight Speed:	ft/sec		
Application Rate:	lbs/ac	Flight Swath:	ft	Wind: From	at MPH
Empty Hopper Weight:	lbs	Spinner Speed:	RPM	Relative Humidity:	%
Full Hopper Weight:	lbs	Flight No. 1 2 3 4 5 6 7 8 9 10		Temperature:	°F



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