

# New Technologies: Aerial Granular Swath Characterization

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# Why should we Calibrate/Characterize?

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**Label Requirements**

**Efficient and Effective**

**Conduct correct and defensible applications**

**Aids in resistance management**

# Standard Calibration Math

- Granular Flow Calibration Equation

- $$\text{PPM} = \frac{[\text{PPA} \times \text{Speed (mph)} \times \text{Swath (Ft)}]}{495}$$

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- PPM = Pounds per Minute

- PPA = Pounds per Acre

- 495 = 43,560 square feet/1 acre x 1 mile/5,280 feet x 60 minutes/1 hour



# Online Calibration Calculators

- <https://www.valentbiosciences.com/publichealth/calibration-calculators/>

## Calibration Calculators

Welcome to the calibration calculator home page!

Start by selecting a calculator from the tabs and answer the required inputs.

To receive a printable PDF of the report, enter your email address and select "Send Report"

Flow Rate - Granule

Flow Rate - WDG

Flow Rate - Liquid Diluted

Flow Rate - Liquid Undiluted

Application Coverage

### Flow Rate - Granule

Units of Measure: \*

Imperial (US)

Metric

Equipment type: \*

Variable Flow Equipment

Fixed Flow Equipment

Application Platform: \*

Ground

Air

# Online Calibration Calculators



Application Rate - Pounds/Acre (lbs./ac): \*

Pounds/Acre (lbs./ac)

Speed of the equipment - Miles/Hour (mph): \*

Miles/Hour (mph)

Swath - Feet (ft): \*

Feet (ft)

Flow Rate - Pounds/Minute (PPM):

Pounds/Minute (PPM)

Equation

$Flow\ Rate\ (Granular) = (Application\ Rate \times Speed\ of\ the\ equipment \times Swath) / 495$

Altitude - Feet (ft): \*

Feet (ft)

## Summary

Units of Measure: Imperial (US)

Type of Equipment: Helicopter

Type of Habitat:

Product:

Application Rate - Pounds/Acre (lbs./ac): 5

Speed of the equipment - Miles/Hour (mph): 70

Swath - Feet (ft): 70

Flow Rate - Pounds/Minute (PPM): 49.49

Altitude - Feet (ft): 50

## Estimate Coverage (Acres/Minute)

Speed of equipment - Miles/Hour (mph): \*

Miles/Hour (mph)

Coverage - Acres/Minute (APM):

Acres/Minute (APM)

Swath width of application (Feet (ft)): \*

Feet (ft)

## Total Acres Treated

Acres Per Minute (APM):

Acres/Minute (APM)

Total Acres (ac) Treated:

Acres (ac)

Minutes (min) Treated: \*

Minutes (min)



# Aerial Granular Flow Calibration

- Materials Needed

- Sprayer Equipment
- Product
- Timer
- Scale (accurate to the second decimal place)
- Catch Can/Tub/Bag

- Directions

- Collect material for one min.
- Weigh contents
- Adjust roller speed if needed or gate opening
- Repeat until 3 consistent measurements are achieved



# Aerial Granular Swath Analysis

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- Goals
  - Achieve desired mean application rate
  - Achieve a CoV of <30
    - Ensure even distribution across the swath



# Aerial Granular Swath Characterization



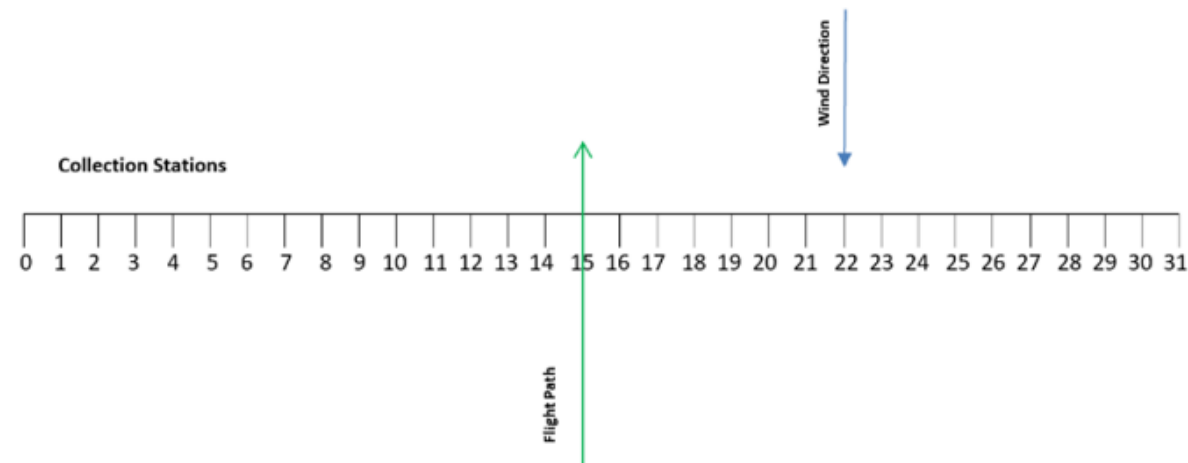
- Materials Needed
  - Application Equipment
  - Product
  - Gram Scale (3 decimals)
  - Catch Buckets/Tubs (26)
  - Tape Measure or Wheel
  - Cones or Flags (3) for flight line



# Swath Analysis

- Methods

- Fly perpendicular over the buckets
  - Using operational speeds and altitude
- Collect material in buckets and weigh (3 replicates)
  - Tip: first and last tub should be empty
- Enter weight (grams) data into excel worksheet
- Download excel sheet into analysis program to determine application rate & swath



# Aerial Granular Swath Characterization Tool



- [https://valentbiosciences.shinyapps.io/Swath\\_Analysis\\_Excel/](https://valentbiosciences.shinyapps.io/Swath_Analysis_Excel/)

Authorization required

Access to this content is restricted.

Login

! Login

Don't have an account?  
Sign Up

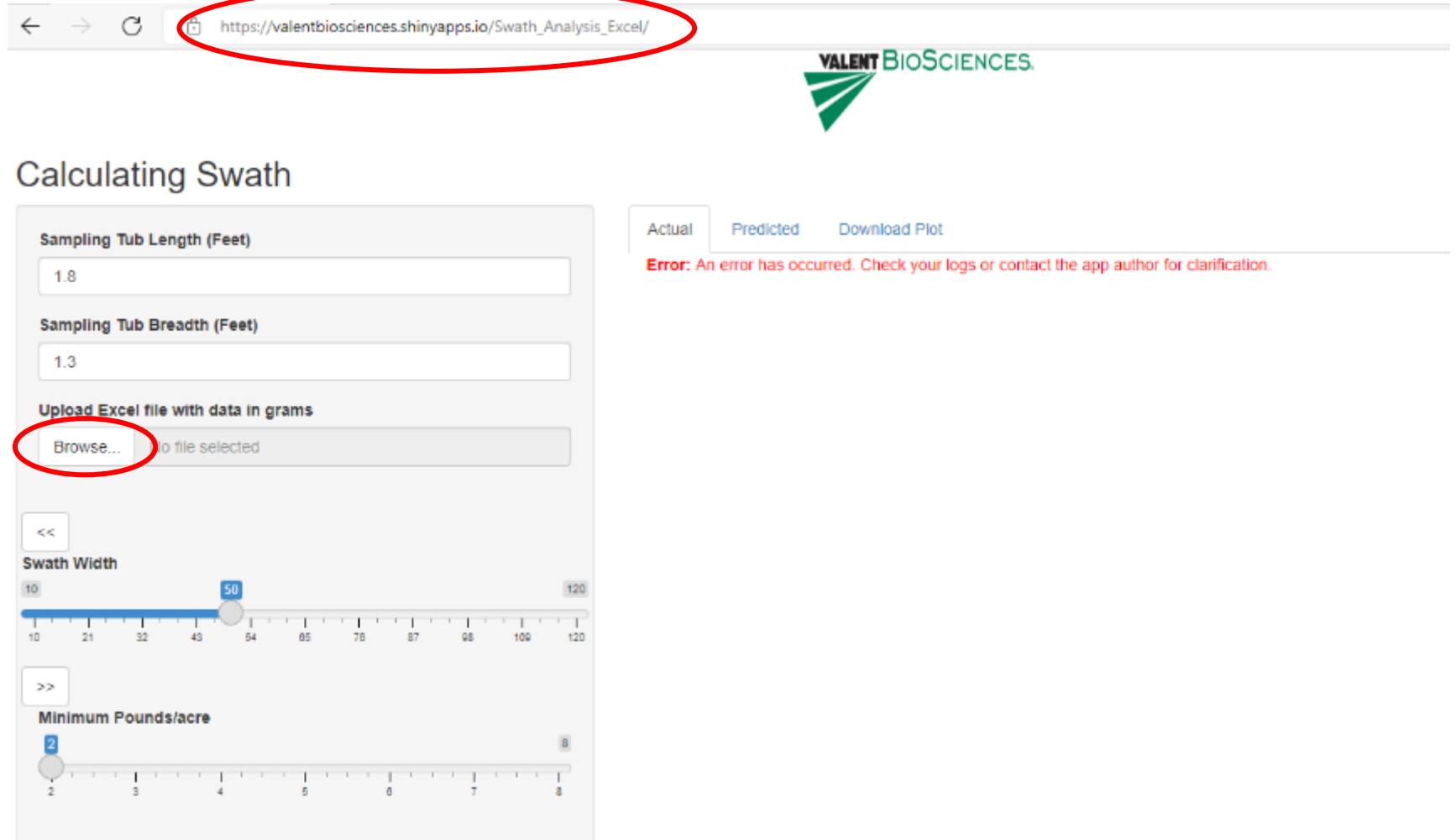
Email

Continue

Forgot your password?

# Swath Analysis

	A	B
1	Feet	Deposit
2	0	0.008
3	3	0.013
4	6	0.049
5	9	0.043
6	12	0.109
7	15	0.114
8	18	0.072
9	21	0.064
0	24	0.069
1	27	0.112
2	30	0.095
3	33	0.103
4	36	0.109
5	39	0.099
6	42	0.152
7	45	0.223
8	48	0.233
9	51	0.307
0	54	0.234
1	57	0.180
2	60	0.117
3	63	0.065
4	66	0.066
5	69	0.071
6	72	0.075
7	75	0.151
8	78	0.000
9	81	0.000
0	84	0.000
1	87	0.000
2	90	0.000



← → ↻ [https://valentbiosciences.shinyapps.io/Swath\\_Analysis\\_Excel/](https://valentbiosciences.shinyapps.io/Swath_Analysis_Excel/)

**VALENT BIOSCIENCES**

## Calculating Swath

Actual Predicted Download Plot

**Error:** An error has occurred. Check your logs or contact the app author for clarification.

Sampling Tub Length (Feet)  
1.8

Sampling Tub Breadth (Feet)  
1.3

Upload Excel file with data in grams  
**Browse...** No file selected

Swath Width  
10 50 120

Minimum Pounds/acre  
2 8

# Calculating Swath



## Calculating Swath

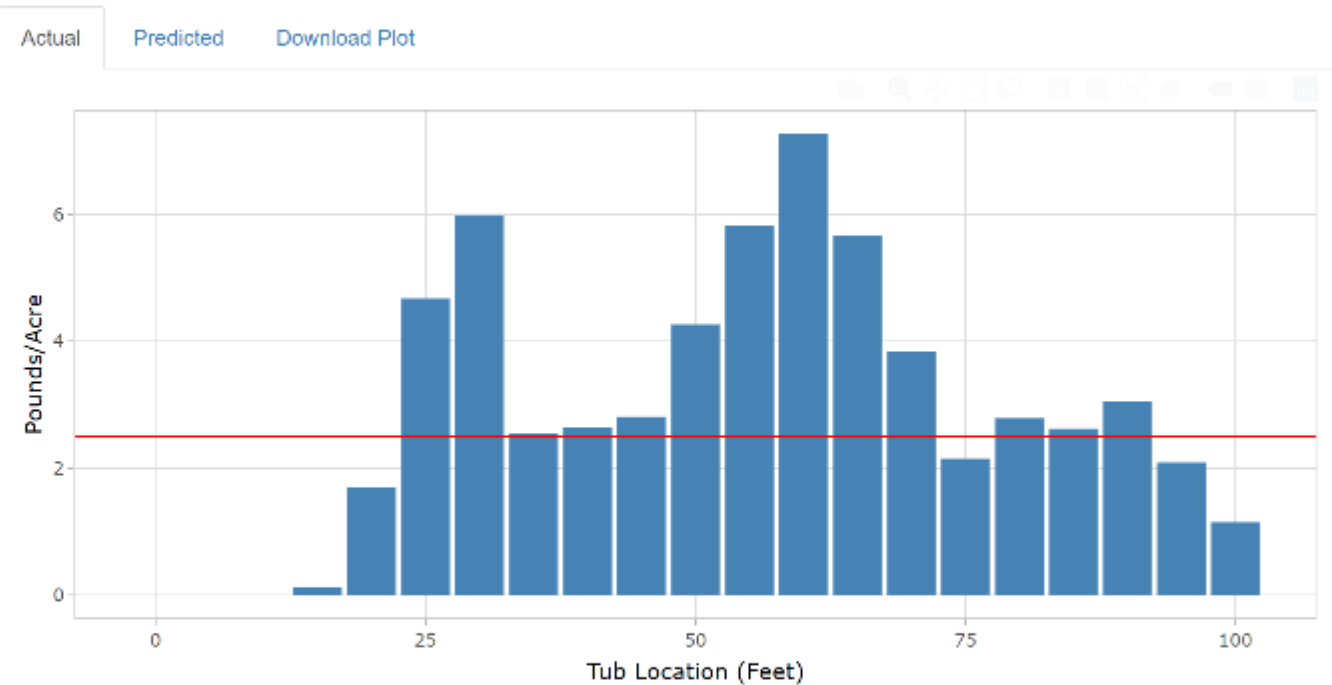
**Sampling Tub Length (Feet)**

**Sampling Tub Breadth (Feet)**

**Upload Excel file with data in grams**

**Swath Width**

**Minimum Pounds/acre**



# Calculating Swath

## Calculating Swath

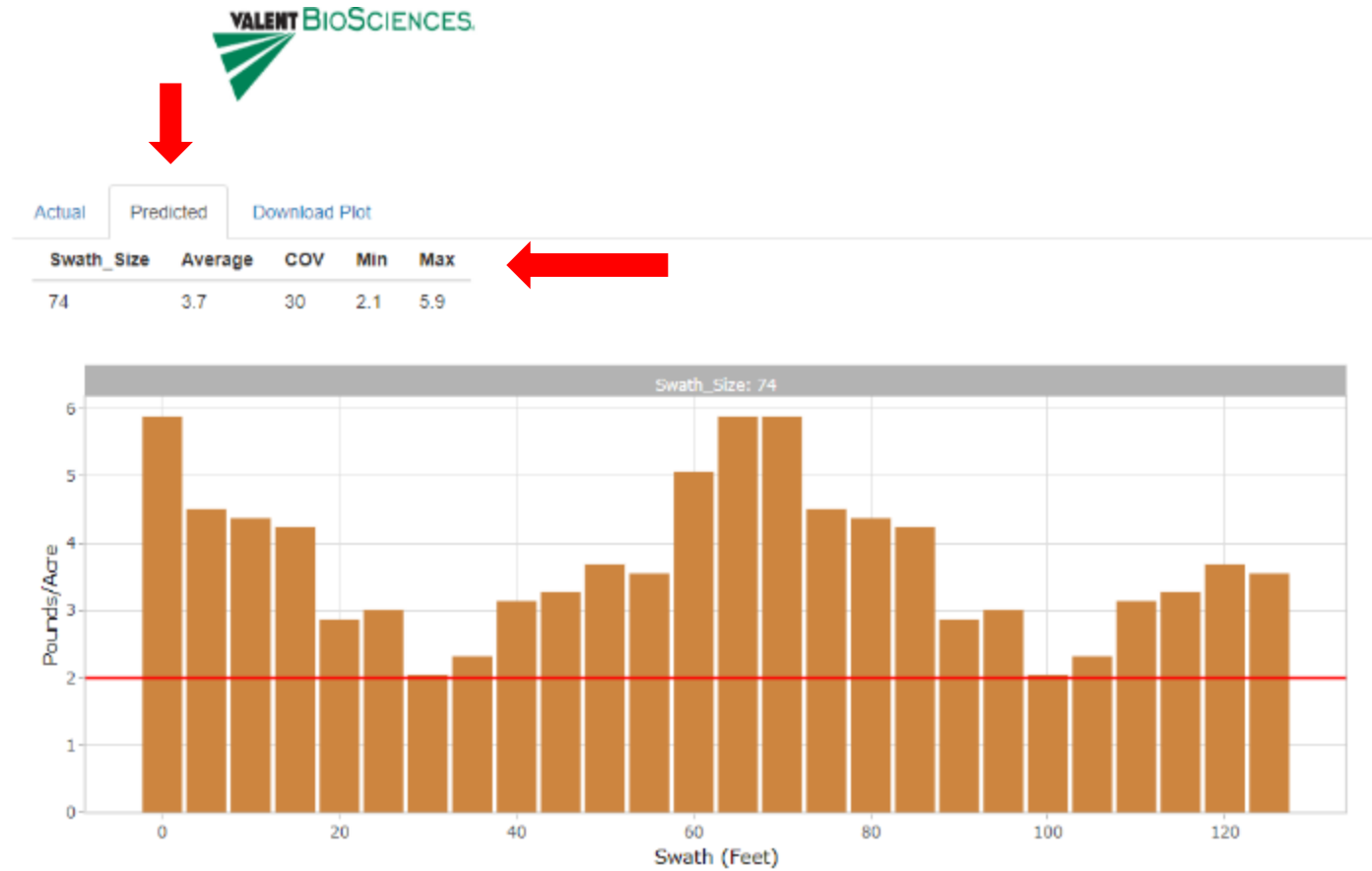
Sampling Tub Length (Feet)

Sampling Tub Breadth (Feet)

Upload Excel file with data in grams  
 Swath Analysis Weight Entry\_MetaLarv\_062022\_Runs 1-

<< Swath Width  >>

>> Minimum Pounds/acre  <<





# Calculating Swath



## Calculating Swath

**Sampling Tub Length (Feet)**

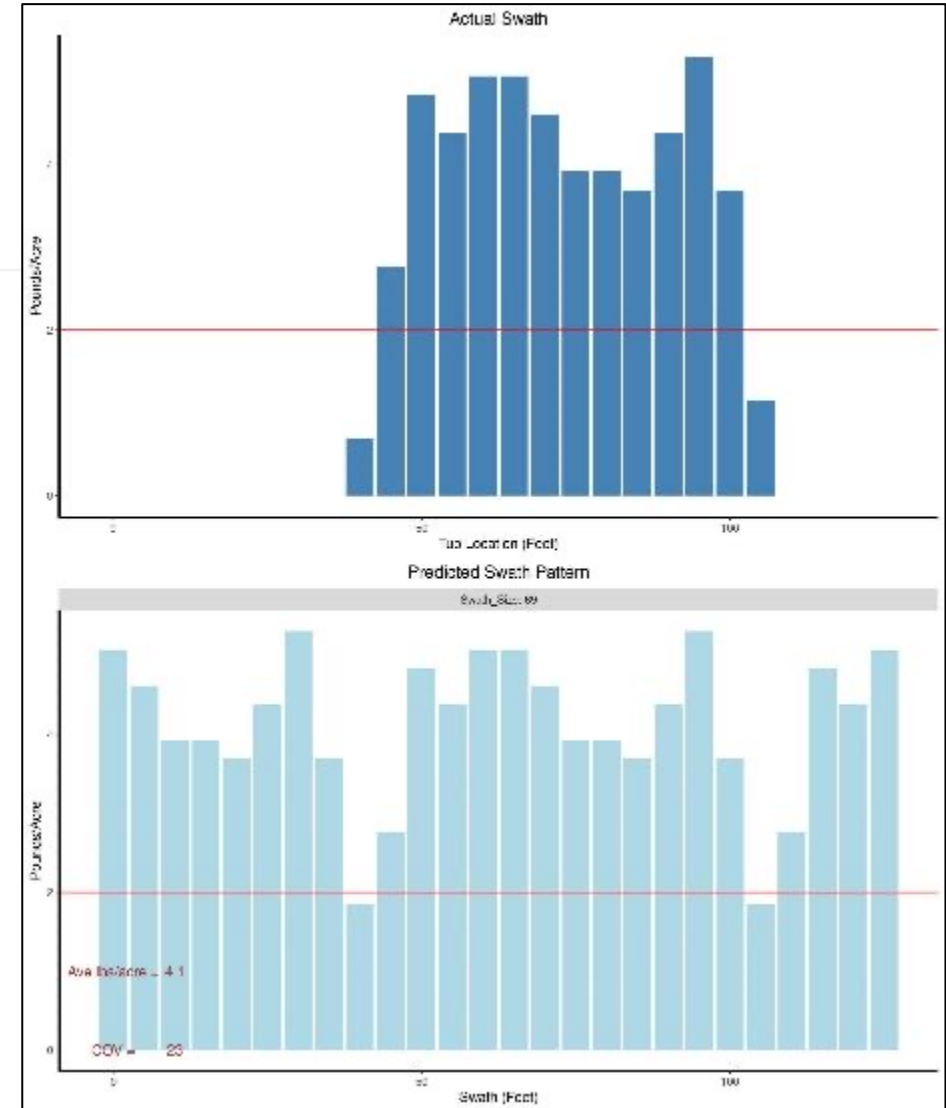
**Sampling Tub Breadth (Feet)**

**Upload Excel file with data in grams**

**Swath Width**

**Minimum Pounds/acre**

Actual Predicted **Download Plot**



# Calculating Swath

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**Live Example:**

[Aerial Granular Characterization](#)

# Calibration Calculator

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