Worksheet for Calculating a Regression Line

1st Fill in the following table with information from shrubs estimated (column 1) and actual or clipped weight (column 3). You can use your "Direct Weight Estimate", "Reference Unit Method" or "Dimension Analysis" as your estimate.

	Estimate 1	2	*Actual* 3	4	5
Plot	X	X^2	Y	Y^2	XY
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
Total	$\sum X$	$\sum X^2$	$\sum Y$	$\sum Y^2$	$\sum XY$

Column 1, Enter weight **estimated** in field

Column 2*, Square each value in column 1

Column 3, Enter **actual** clipped weight

Column 4*, Square each value in column 3

Column 5, Multiply each value in column 1 with its corresponding value in column 3

* If your calculator has a $\sum X^2$ function you can just put the $\sum X^2$ in appropriate box after inputting all of the x's. Same for y's.

2nd Calculate the following values:

$n = number\ of\ shrubs\ clipped =$

$\overline{X} = \frac{\sum X}{n} = average\ of\ all\ estimates =$

$\overline{Y} = \frac{\sum Y}{n} = average\ of\ actual\ weights =$

$SS_X = \sum X^2 - \frac{(\sum X)^2}{n} =$

$SS_Y = \sum Y^2 - \frac{(\sum Y)^2}{n} =$

$SS_{XY} = \sum XY - \frac{(\sum X)(\sum Y)}{n} =$

3rd Calculate **slope** of line:

$$m = \frac{SS_{XY}}{SS_X} =$$

4th Calculate **y-intercept** of line:

$$b = \overline{Y} - (m * \overline{X}) =$$

5th calculate correlation value or ***r*** (yes r^2 or R^2 really is just ***r*** squared or r * r)

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{\left[n\sum x^2 - (\sum x)^2\right]\left[n\sum y^2 - (\sum y)^2\right]}}$$

6th Line **equation** is:

y = (slope * x) + intercept, or, $y = (m * x) + b$