**Making histograms (phenotypic frequency distributions) using Excel**

This demonstration uses data from the Oregon Wolfe Barley population. The data set is available at <http://wheat.pw.usda.gov/ggpages/maps/OWB/>. This example uses just one of the phenotype data sets (floret number) as an example. The example is based on the full population of doubled haploids: anther culture (AC) plus *Hordeum bulbosum* (H.b.).



1. Download the data set in Excel format.
2. Be sure that the Analysis ToolPak add-in is installed on your computer. To our knowledge, this add-in is NOT available for MAC users. This example uses Windows 2010. Other versions may have the Analysis ToolPak add-in.
	1. To determine if the Analysis ToolPak is available on your computer, click the “Data” tab.
	2. If you see “Data Analysis” on the far right of the toolbar, you are all set.
	3. If you do not see “Data analysis” you need to load it.
		1. On the “File” Tab click “Options”.
		2. Click on “Add-Ins”. Click on “Go” next to Manage at the bottom.
		3. Check the Analysis ToolPak and click “Ok”.
3. Go to the Excel data file.
	1. In the example, column C has the “raw” phenotype data.
	2. Column D indicates the bins you wish to have in your figure. In the example, the bins increase by five. You can elect to make smaller or larger groupings.
	3. To generate frequencies for each bin, click on “Data analysis” and then “Histogram”.
	4. The input range is column C (including the label in row 1). The bin range is column D, (including the label in row 1). Do not include the parents at the bottom.
	5. Check the “Labels” box.
	6. Under Output options you can choose a location on the same page for the output or you can choose a new worksheet or a new workbook.
	7. Check the “Chart Output”.
	8. Click OK – you have a simple histogram!
4. By clicking on the chart the “Chart Tools” tab will open and you can change axis labels, graph titles, and add information about the parents.
	1. To label parents, insert a text box. Group each text box with the graph to ensure they stay positioned above the correct spot.