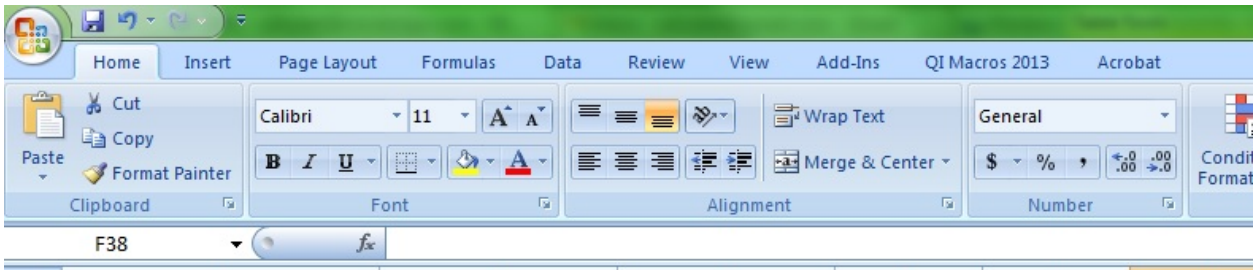
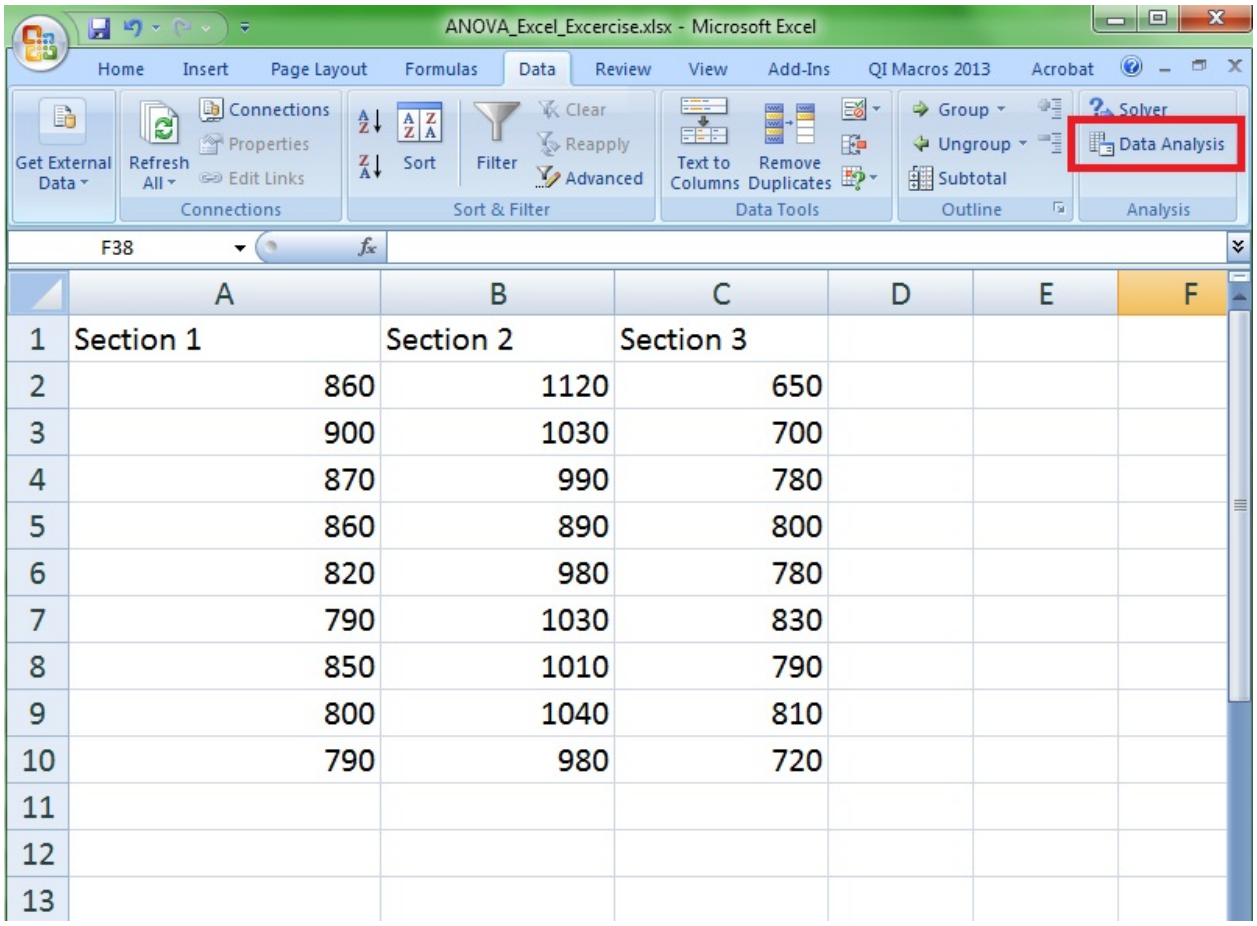
ANOVA In Excel

In this problem, we're comparing the average weekly yield from three different apple orchards.



	A	B	C	D	E	F
1	Section 1	Section 2	Section 3			
2	860	1120	650			
3	900	1030	700			
4	870	990	780			
5	860	890	800			
6	820	980	780			
7	790	1030	830			
8	850	1010	790			
9	800	1040	810			
10	790	980	720			
11						
12						
13						

The null hypothesis is that the three orchards that use different pest management techniques will still have the same average weekly yield.



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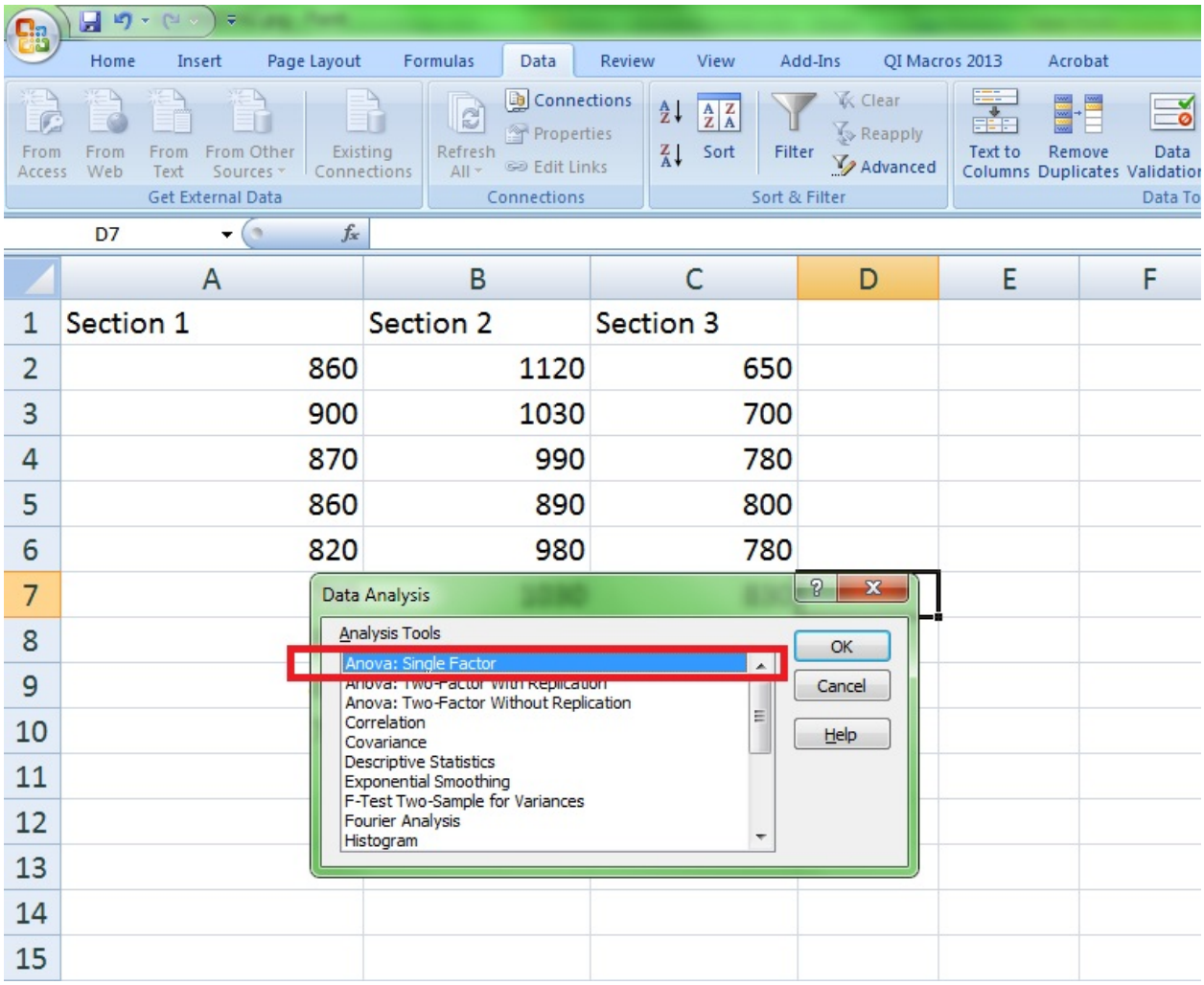
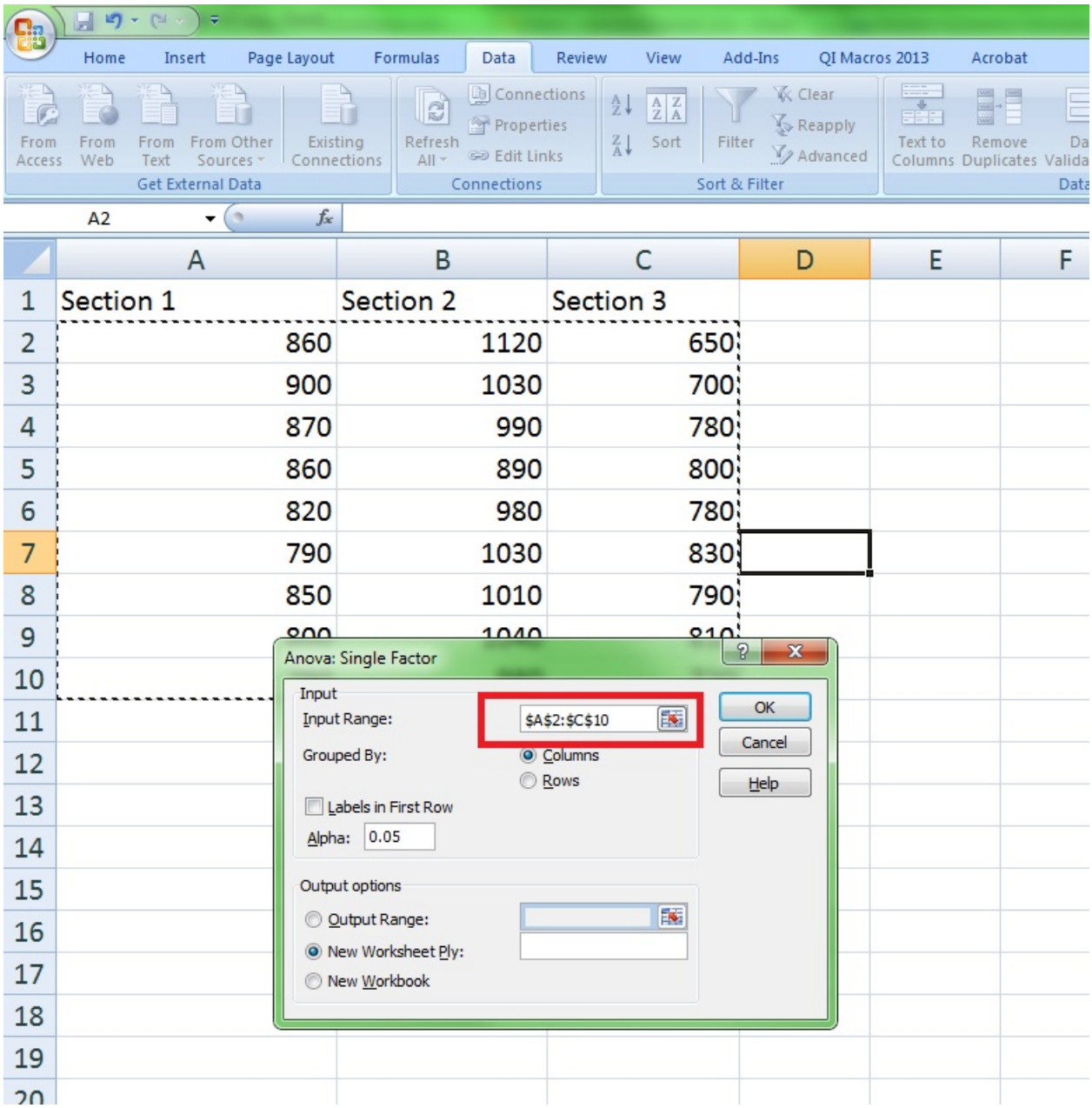
First, locate the Data Analysis Tools in your spreadsheet program. In Excel, there is a Data Analysis Toolpak.

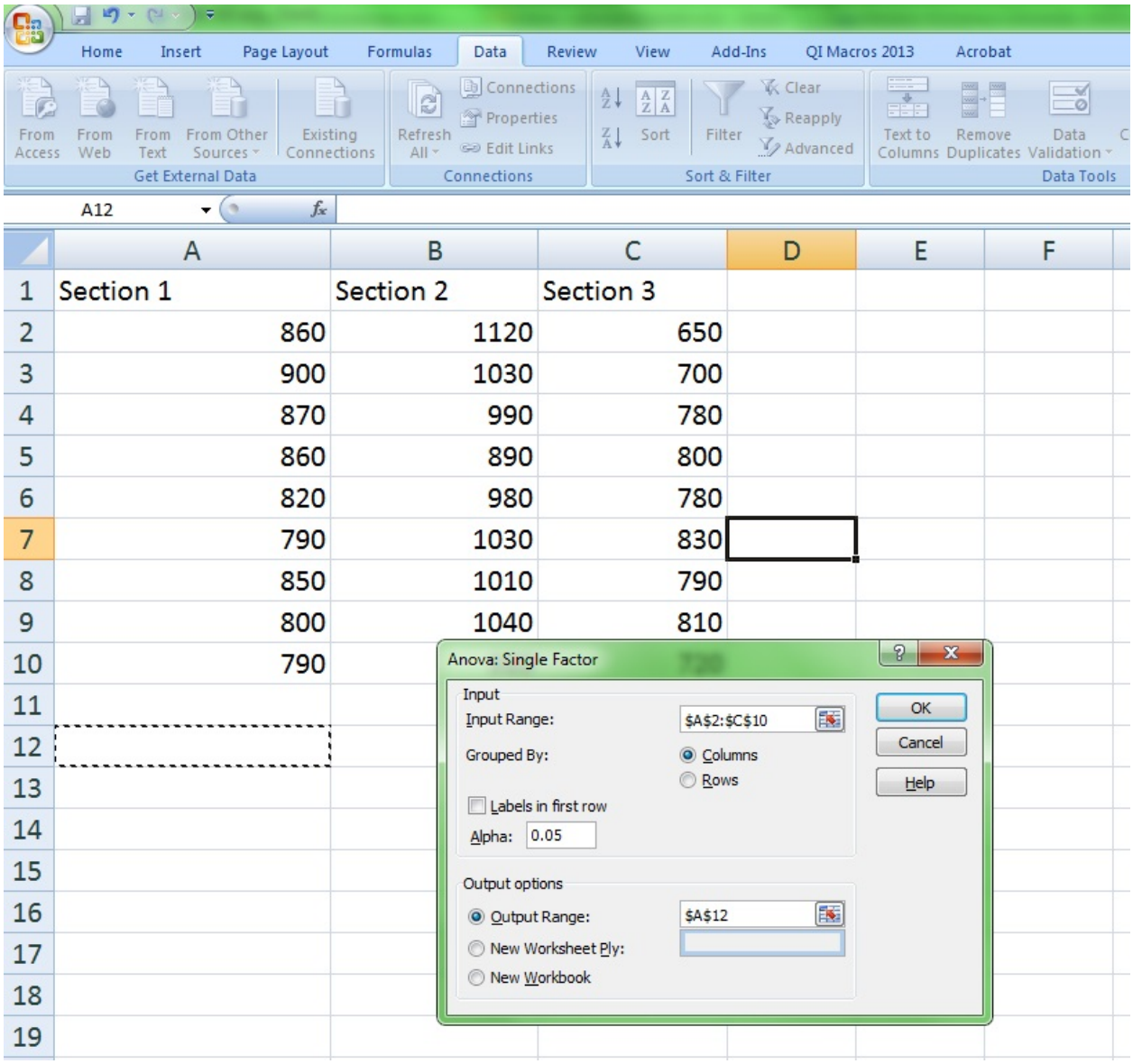
If the “Data Analysis” button is not there in your versin of Excel, click on the windows button in the top left and click on “Excel Options” at the bottom. Once the window opens, click on “Add-Ins” on the left, and then “Excel Add-Ins” next to “Manage” at the bottom. From this, select the “Analysis ToolPak” option and click “OK”. “Data Analysis” should now appear on the right side of the “Data” tab.



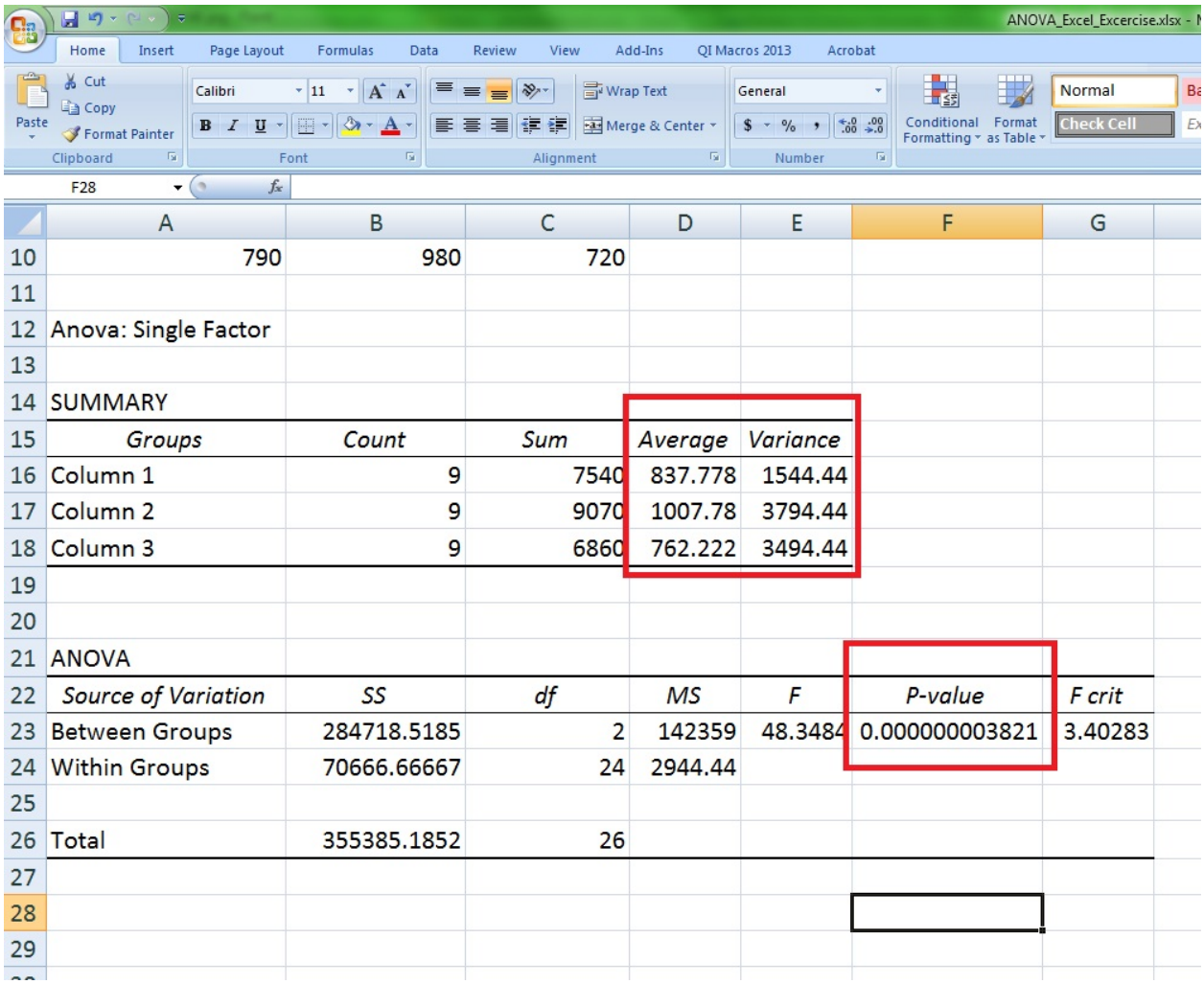
At this point, we have to decide which type of data analysis we want to pursue. Because we're looking at one factor's variance, we choose "ANOVA: Single Factor."



The “Input Range” is the data that is being studied. In this example, you should select the data from cell A2 to C10. Then click OK.



For the “Output Range” select the excel cell that you want the data to go into. In this case, we chose cell A12. Notice that we’ve set the “alpha” is 0.05. Then click “OK.”



	A	B	C	D	E	F	G
10	790	980	720				
11							
12	Anova: Single Factor						
13							
14	SUMMARY						
15	*Groups*	*Count*	*Sum*	*Average*	*Variance*		
16	Column 1	9	7540	837.778	1544.44		
17	Column 2	9	9070	1007.78	3794.44		
18	Column 3	9	6860	762.222	3494.44		
19							
20							
21	ANOVA						
22	*Source of Variation*	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
23	Between Groups	284718.5185	2	142359	48.3484	0.000000003821	3.40283
24	Within Groups	70666.66667	24	2944.44			
25							
26	Total	355385.1852	26				
27							
28							
29							

From these results we notice the differences in the means and the variances. The statistical proof that these are different is that the p-value is less than alpha (0.05).

This means that we can *reject the null hypothesis*. Therefore we can conclude that the effects of different pest management techniques DO have an effect on the yield of apples.