Market price data visualization and analysis workflow

International Food Policy Research Institute

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Visualization: Dashboards in Excel

- Gives quick data insight
- Quick identification of data outliers
- Gaps and trends over time

Explore the dashboard

- Visualize a graph of three crops at single market for

    1. Pawpaw, sweet potato and Taro-true at POM [from 2009-2020 & 2016-2020]
    2. Pawpaw, sweet potato and Taro-true at Lae [from 2009-2020 & 2016-2020]

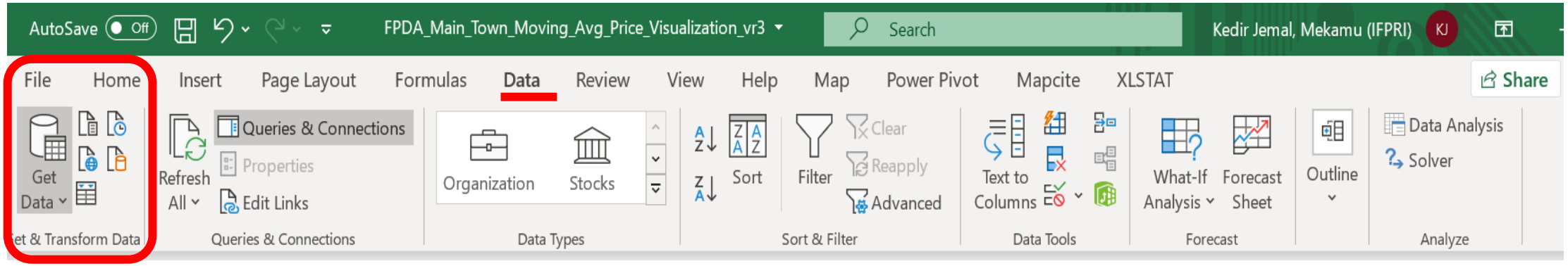
- Visualize a graph of crop price at three markets for

    1. Carrot at POM, Lae and Goroka [from 2009-2020 & 2016-2020]
    2. Sweet potato at POM, Lae and Goroka [from 2009-2020 & 2016-2020]

The following is a simple guide intended to show how the market price data visualized in Microsoft excel

What Is Power Query?

- It is a tool available in Excel that allows import data from many different sources
- Able to clean, transform and reshape data as needed
- It is available as an add-in for Excel 2010 and 2013 and will appear as a new tab in the ribbon labelled **Power Query**.
- In 2016 it was renamed to **Get & Transform** and appears in the **Data** tab without the need to install any add-in.

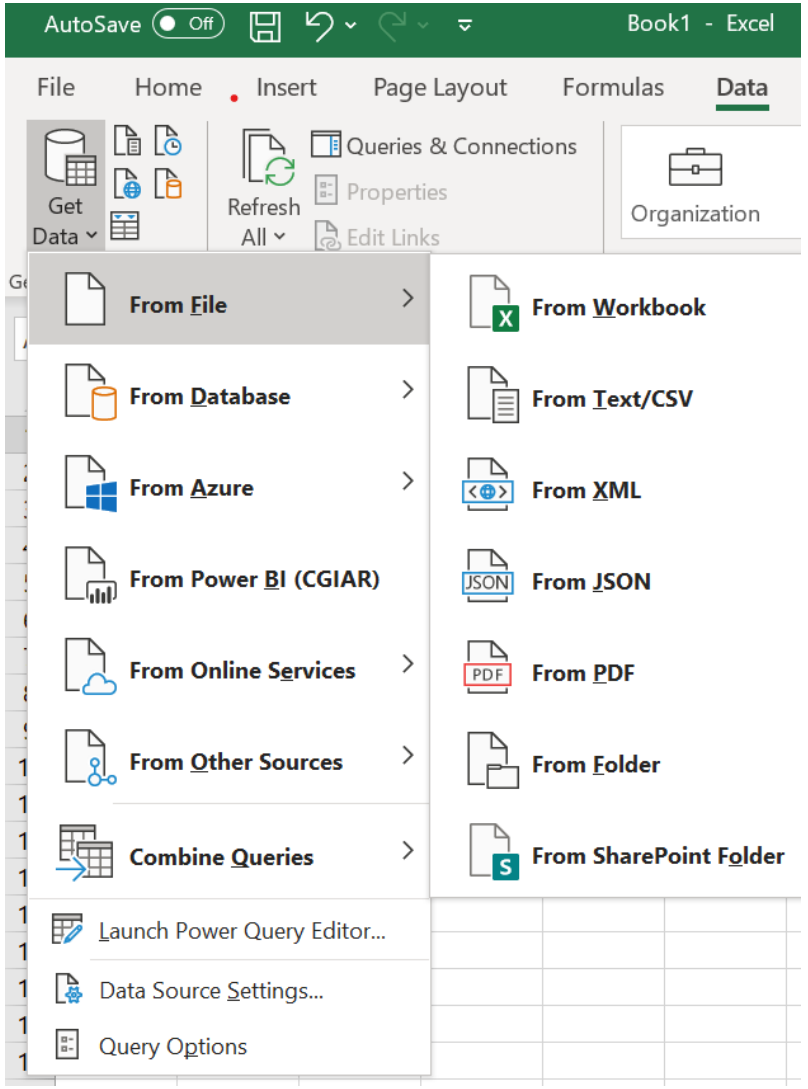


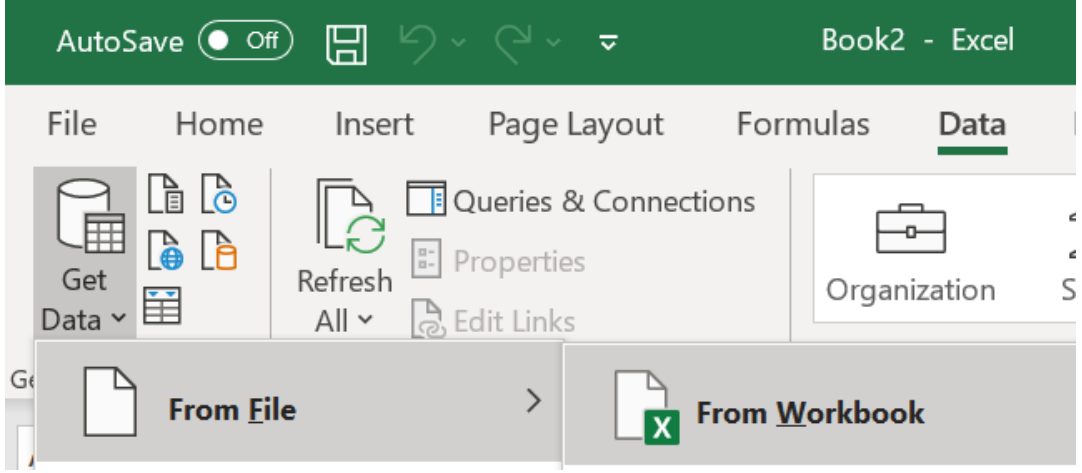
Importing Data With Power Query

Power Query provides many data type options to import

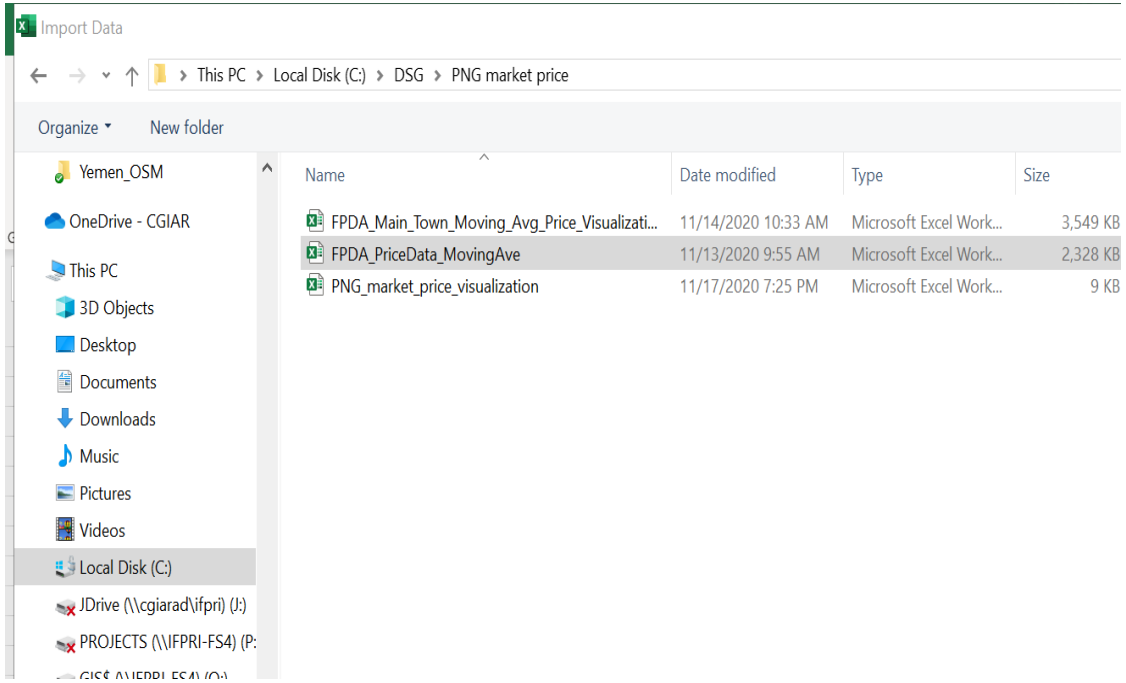
Under **Data** tab click **Get Data** command

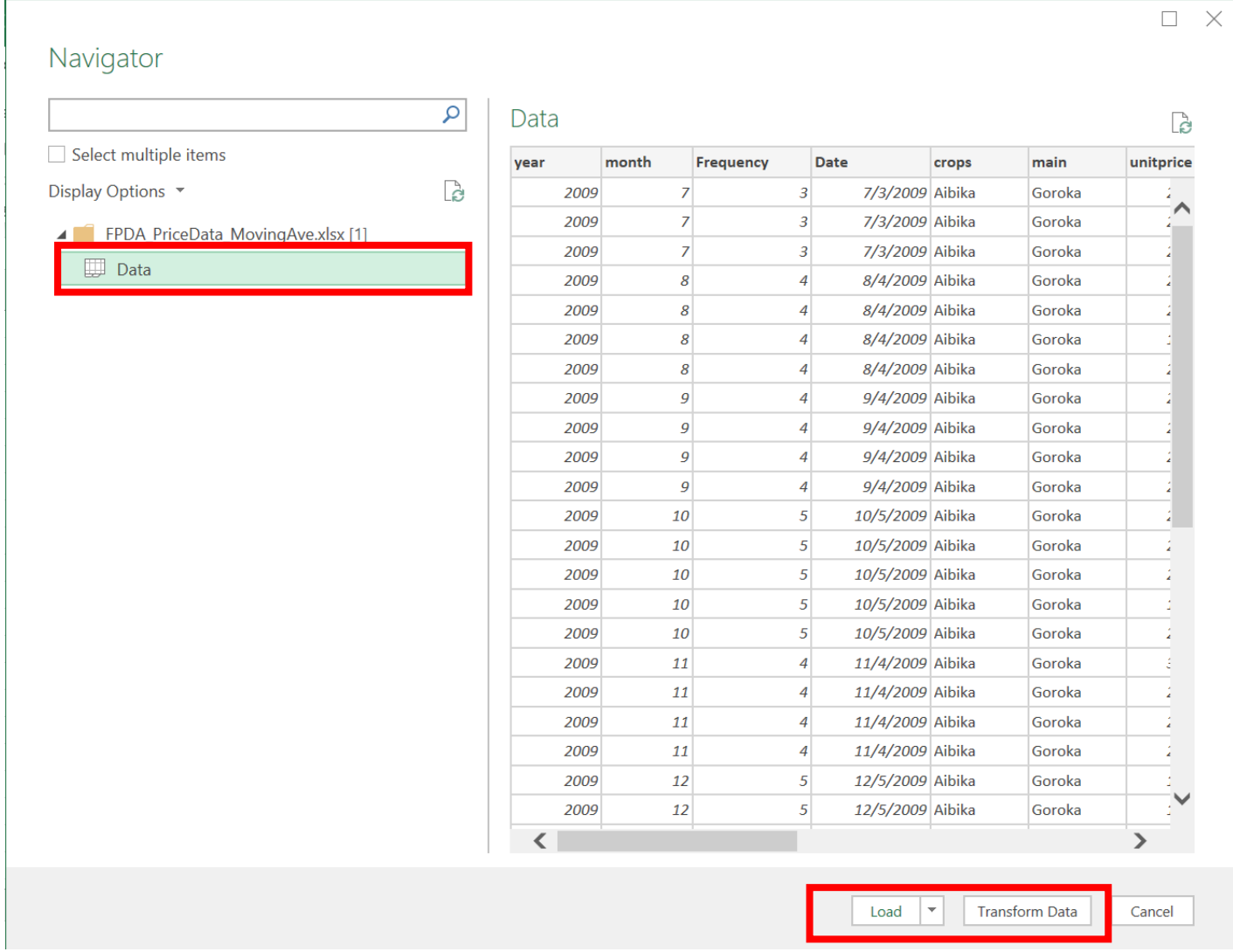
- Get data from a **single file** such as an Excel workbook, Text or CSV file, XML and JSON files
- You can also import multiple files from a given folder





Locate market price excel file

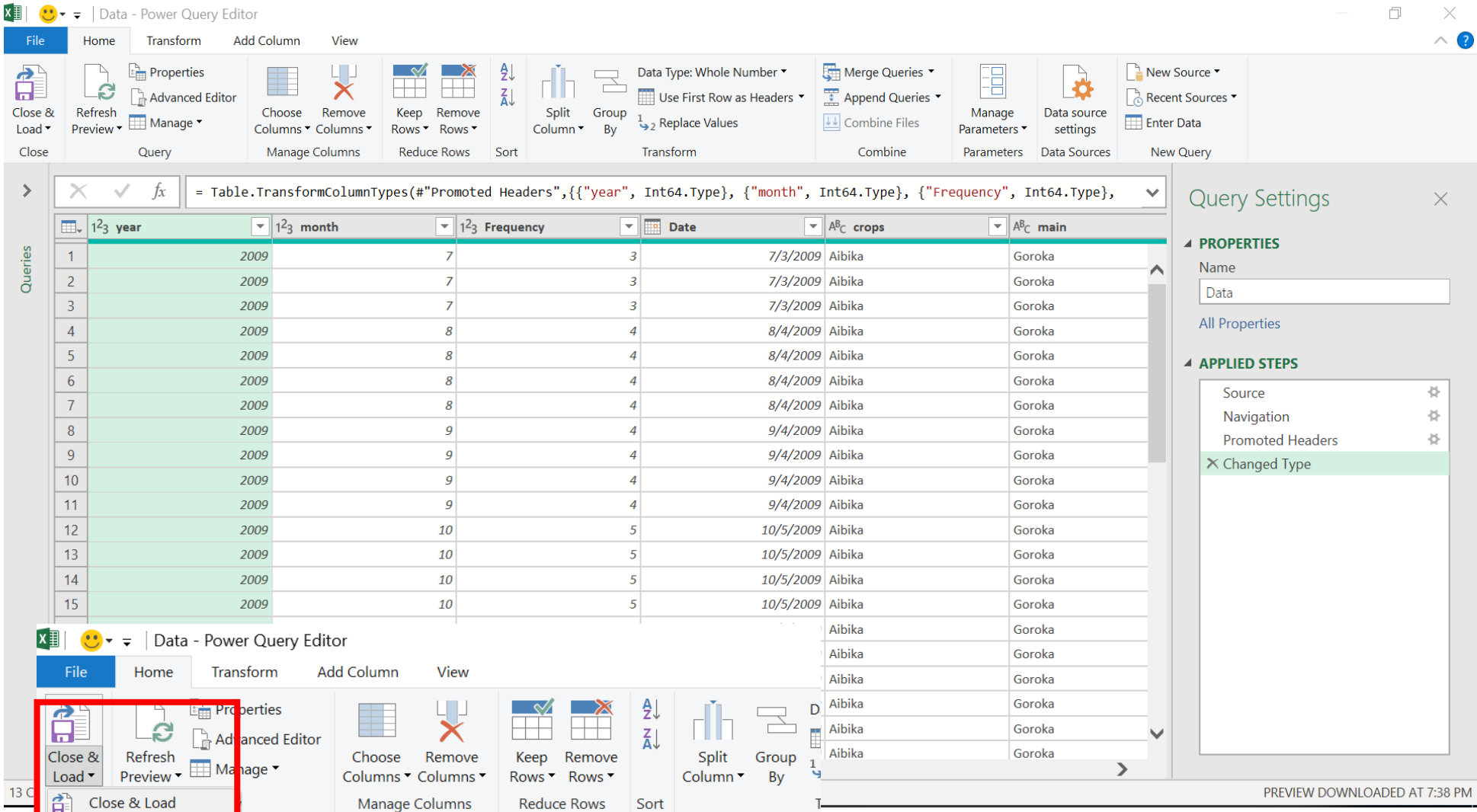


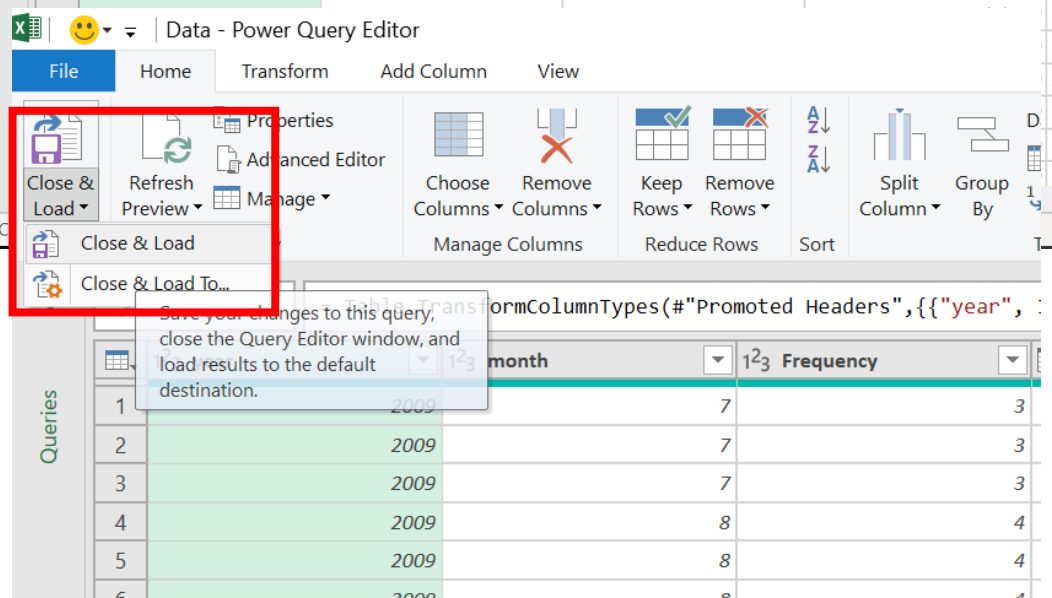


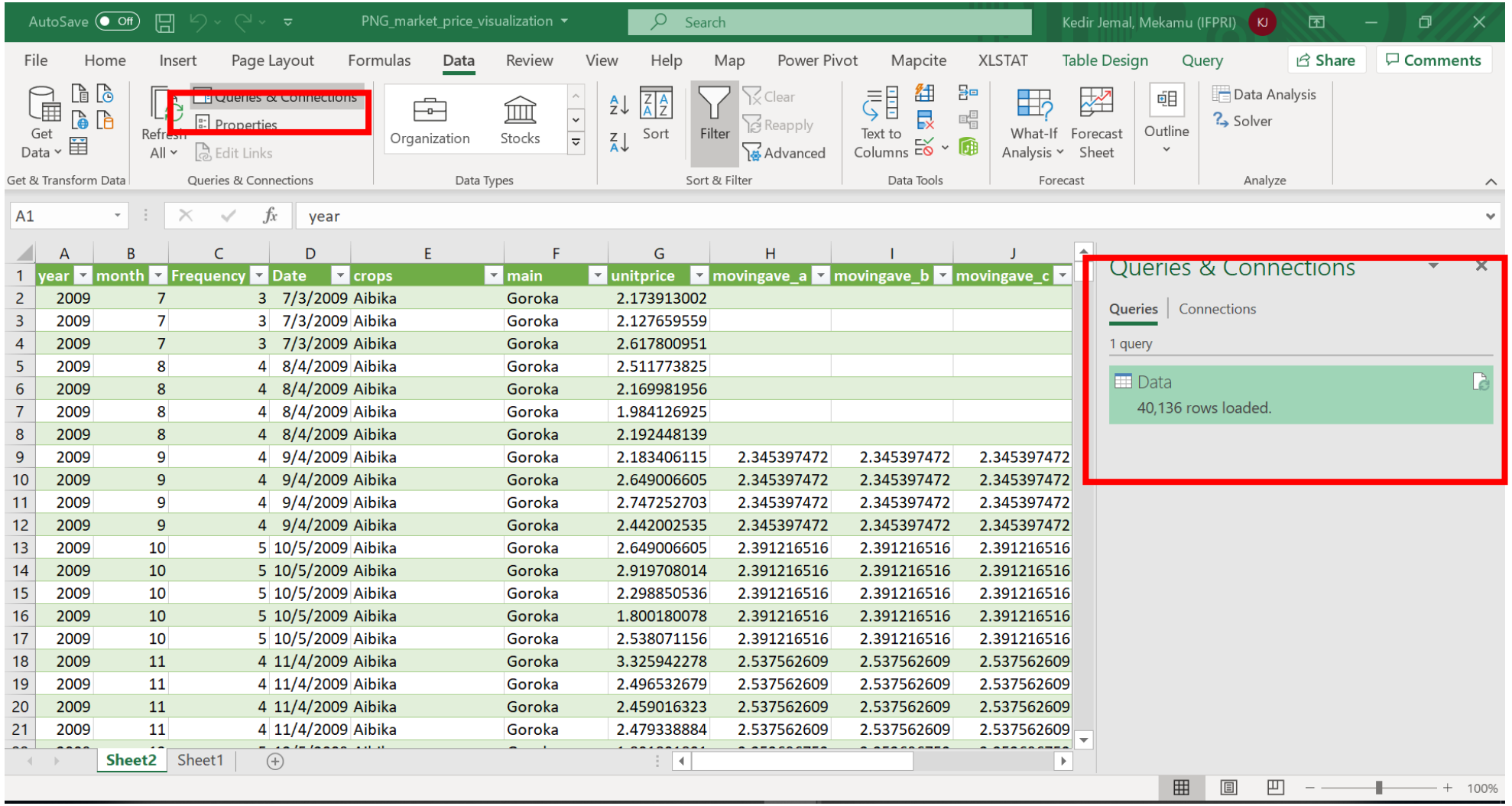
Load the data as is by pressing the **Load** button or proceed to the query editor to apply any data transformation steps by pressing the **Transform Data** button

Here you can edit and transform the data like data type, merge, append, replace error, etc

To load the data click **Close & Load**







	A	B	C	D	E	F	G	H	I	J
1	year	month	Frequency	Date	crops	main	unitprice	movingave_a	movingave_b	movingave_c
2	2009	7	3	7/3/2009	Aibika	Goroka	2.173913002			
3	2009	7	3	7/3/2009	Aibika	Goroka	2.127659559			
4	2009	7	3	7/3/2009	Aibika	Goroka	2.617800951			
5	2009	8	4	8/4/2009	Aibika	Goroka	2.511773825			
6	2009	8	4	8/4/2009	Aibika	Goroka	2.169981956			
7	2009	8	4	8/4/2009	Aibika	Goroka	1.984126925			
8	2009	8	4	8/4/2009	Aibika	Goroka	2.192448139			
9	2009	9	4	9/4/2009	Aibika	Goroka	2.183406115	2.345397472	2.345397472	2.345397472
10	2009	9	4	9/4/2009	Aibika	Goroka	2.649006605	2.345397472	2.345397472	2.345397472
11	2009	9	4	9/4/2009	Aibika	Goroka	2.747252703	2.345397472	2.345397472	2.345397472
12	2009	9	4	9/4/2009	Aibika	Goroka	2.442002535	2.345397472	2.345397472	2.345397472
13	2009	10	5	10/5/2009	Aibika	Goroka	2.649006605	2.391216516	2.391216516	2.391216516
14	2009	10	5	10/5/2009	Aibika	Goroka	2.919708014	2.391216516	2.391216516	2.391216516
15	2009	10	5	10/5/2009	Aibika	Goroka	2.298850536	2.391216516	2.391216516	2.391216516
16	2009	10	5	10/5/2009	Aibika	Goroka	1.800180078	2.391216516	2.391216516	2.391216516
17	2009	10	5	10/5/2009	Aibika	Goroka	2.538071156	2.391216516	2.391216516	2.391216516
18	2009	11	4	11/4/2009	Aibika	Goroka	3.325942278	2.537562609	2.537562609	2.537562609
19	2009	11	4	11/4/2009	Aibika	Goroka	2.496532679	2.537562609	2.537562609	2.537562609
20	2009	11	4	11/4/2009	Aibika	Goroka	2.459016323	2.537562609	2.537562609	2.537562609
21	2009	11	4	11/4/2009	Aibika	Goroka	2.479338884	2.537562609	2.537562609	2.537562609

- When you use the **Close & Load To** option it loads the query to a **table.** If **import data** dialog option appears choose **table** to load the data as a table
- Rename the sheet ‘Data’
- Outside of the power query editor, to access queries in the workbook go to **Data** tab in the Excel ribbon, then press the **Queries & Connections** command button. It will be docked to the right-hand side of the workbook.

Pivot Tables

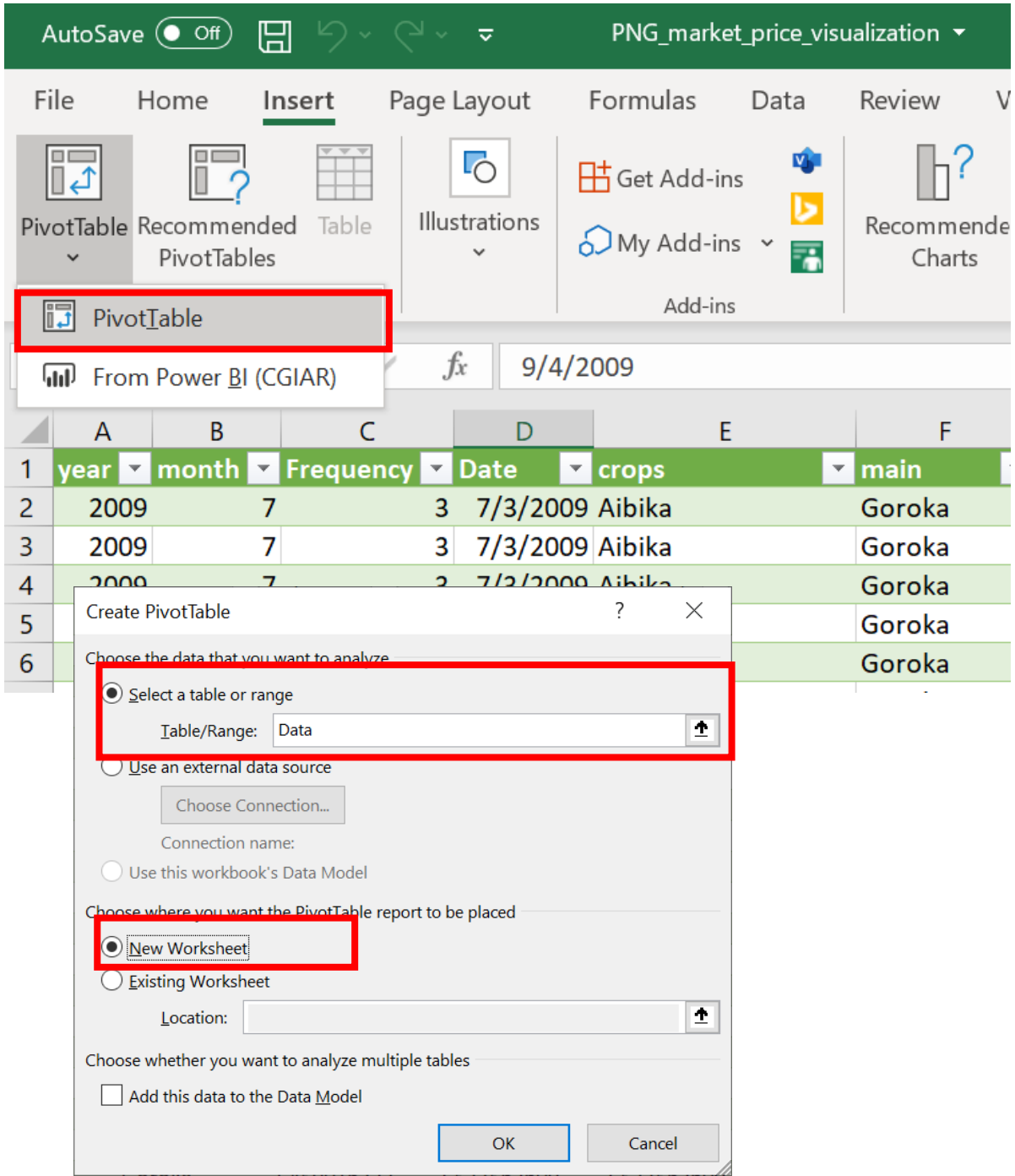
- PivotTables helps make worksheets more manageable by summarizing data and allowing you to manipulate it in different ways

- A PivotTable can instantly calculate and summarize the data in a way that's both easy to read and manipulate

Create a PivotTable

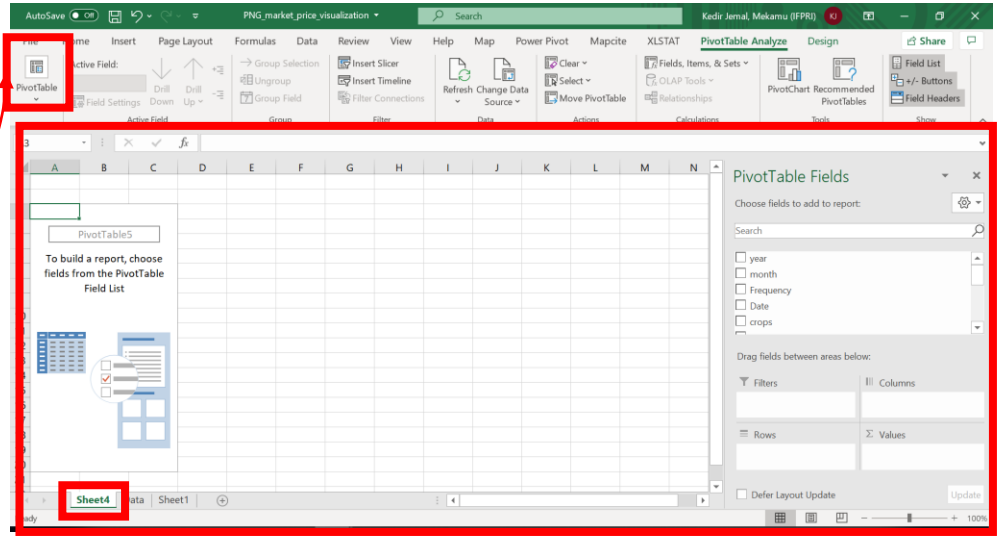
- Select the table or cells (including column headers) containing the data you want to use
- From the Insert tab, click the PivotTable command

- The Create PivotTable dialog box will appear. Choose your settings, then click OK.
- In our case, we'll use *Data* as our source data and place the PivotTable on a new worksheet



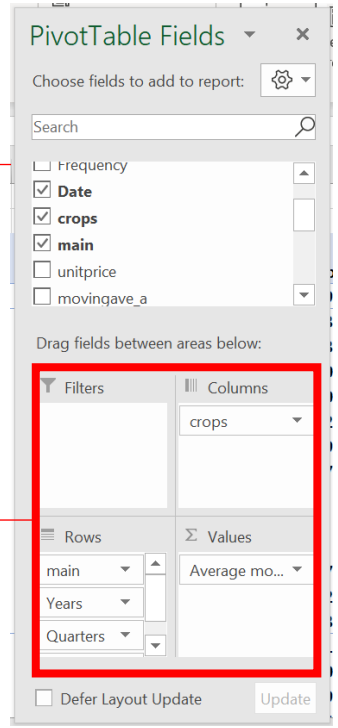
A blank PivotTable and Field List will appear on a new worksheet
Rename the new sheet ‘Crops per market’

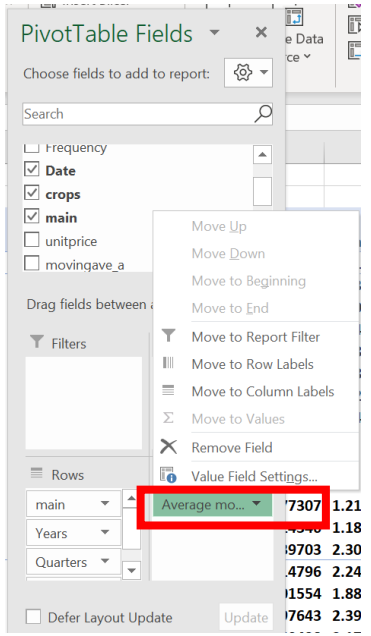
Once you create a PivotTable (give a name-crops per market), choose which fields to add.
Each field is simply a column header from the market price data.
In the PivotTable Field List, check the box for each field you wish to add.
In our example, we want to show crop price for each market over time, so we’ll drag *markets* (*main*) and *date* & year under ‘Rows’, *crops* to ‘Columns’ field and drag *price(movingave_f)* to ‘Value’ field

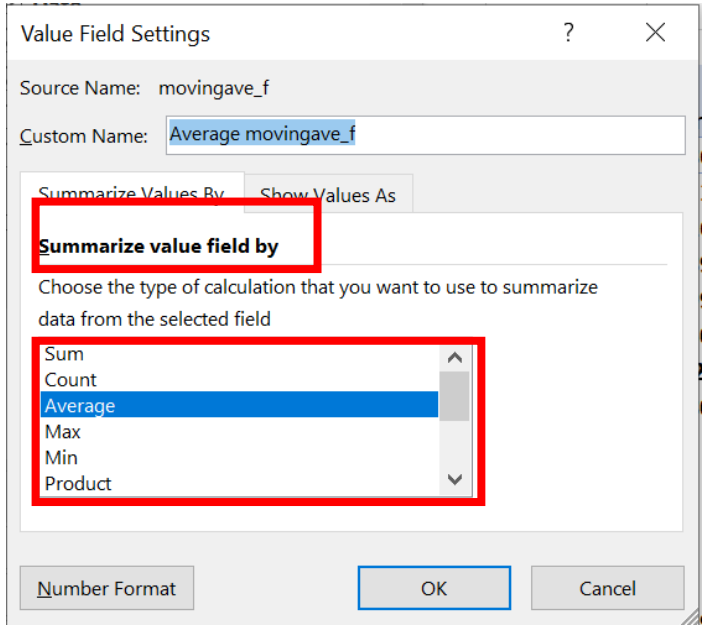


The PivotTable automatically calculate and summarize the selected fields.

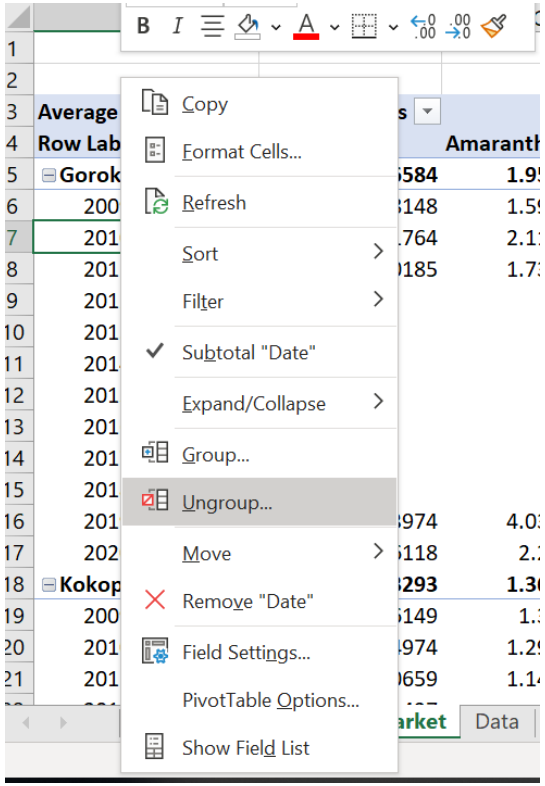
To modify the default summary, right click on the price under value field change the “summarize value field by” option to average



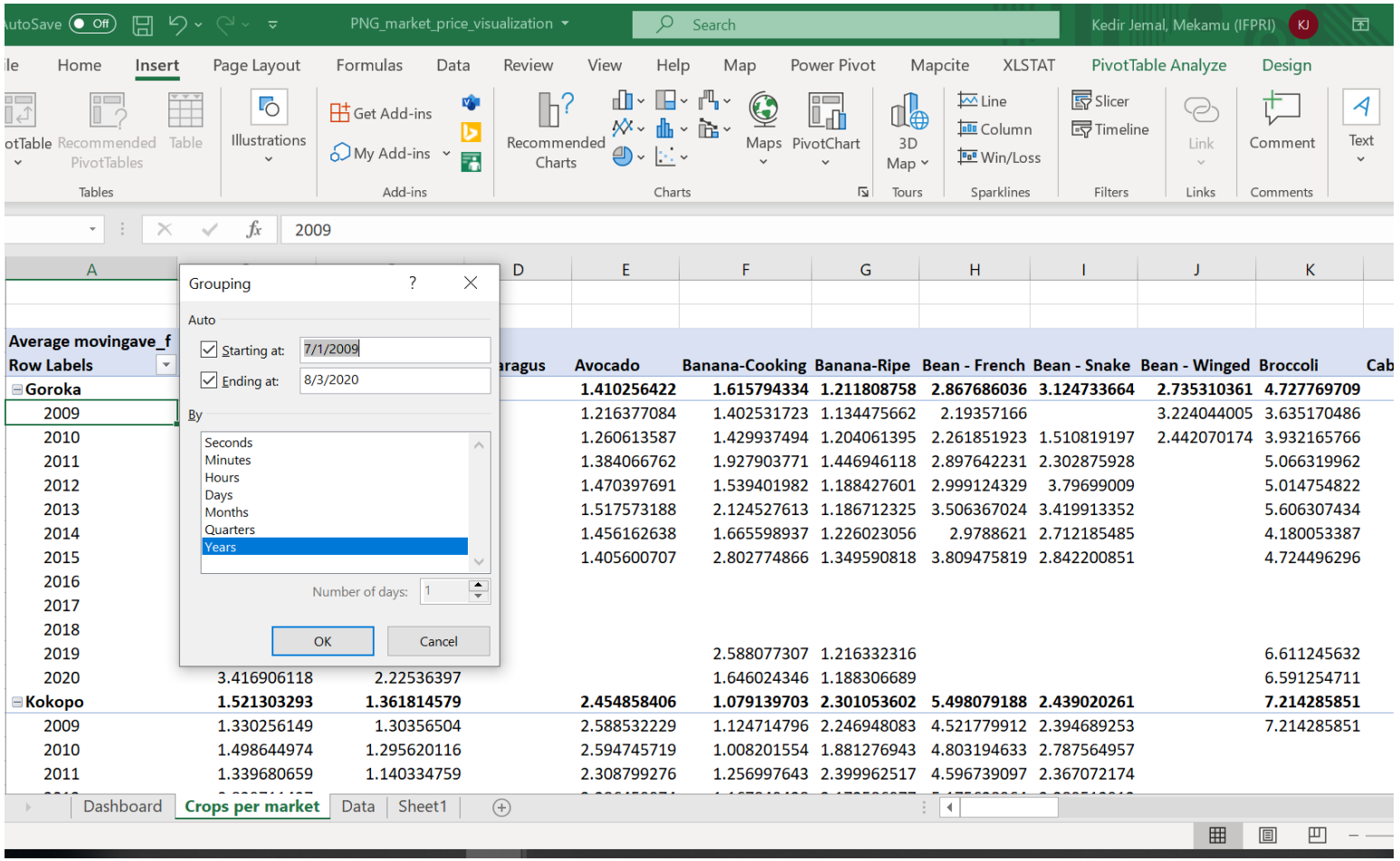




- To be able to view monthly average price, group the *date* value to month.
- While selecting a cell from year column, right click and press ‘group’



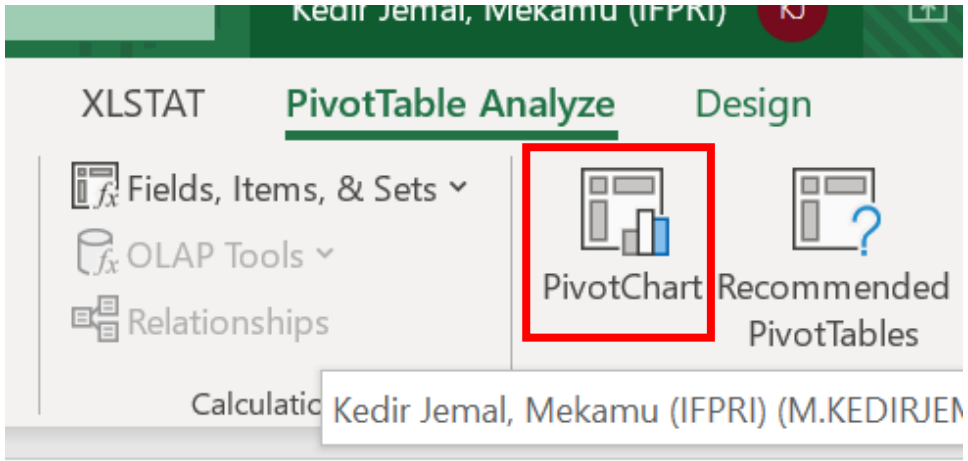
- From Grouping dialog box, select only Month



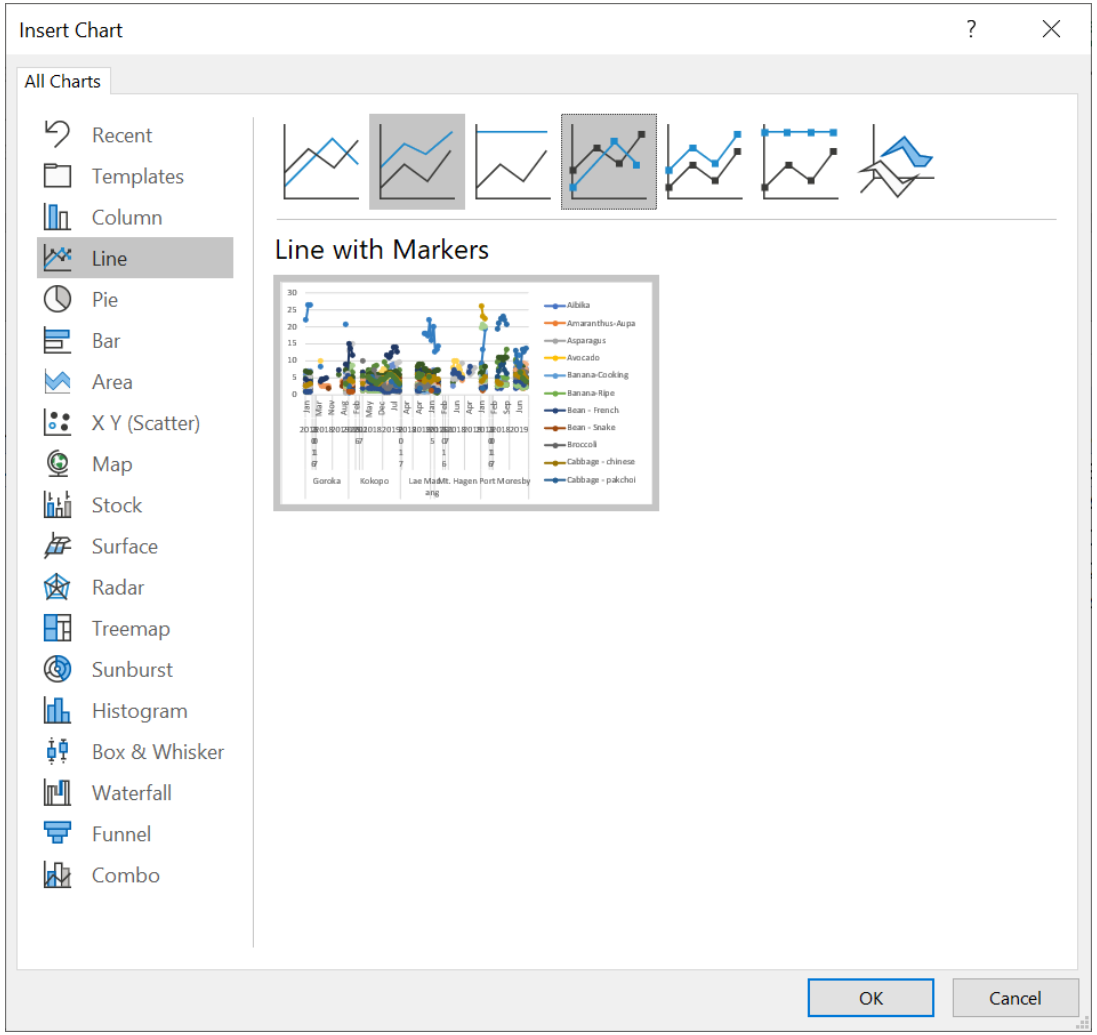
Pivot Charts

- Pivot Charts display data from a PivotTable
- Filters are automatically displayed in the chart to sort and filter the underlying data
- Changes to the field layout and data in the associated PivotTable are immediately reflected in the PivotChart
- Just like regular charts, you'll be able to modify the chart properties

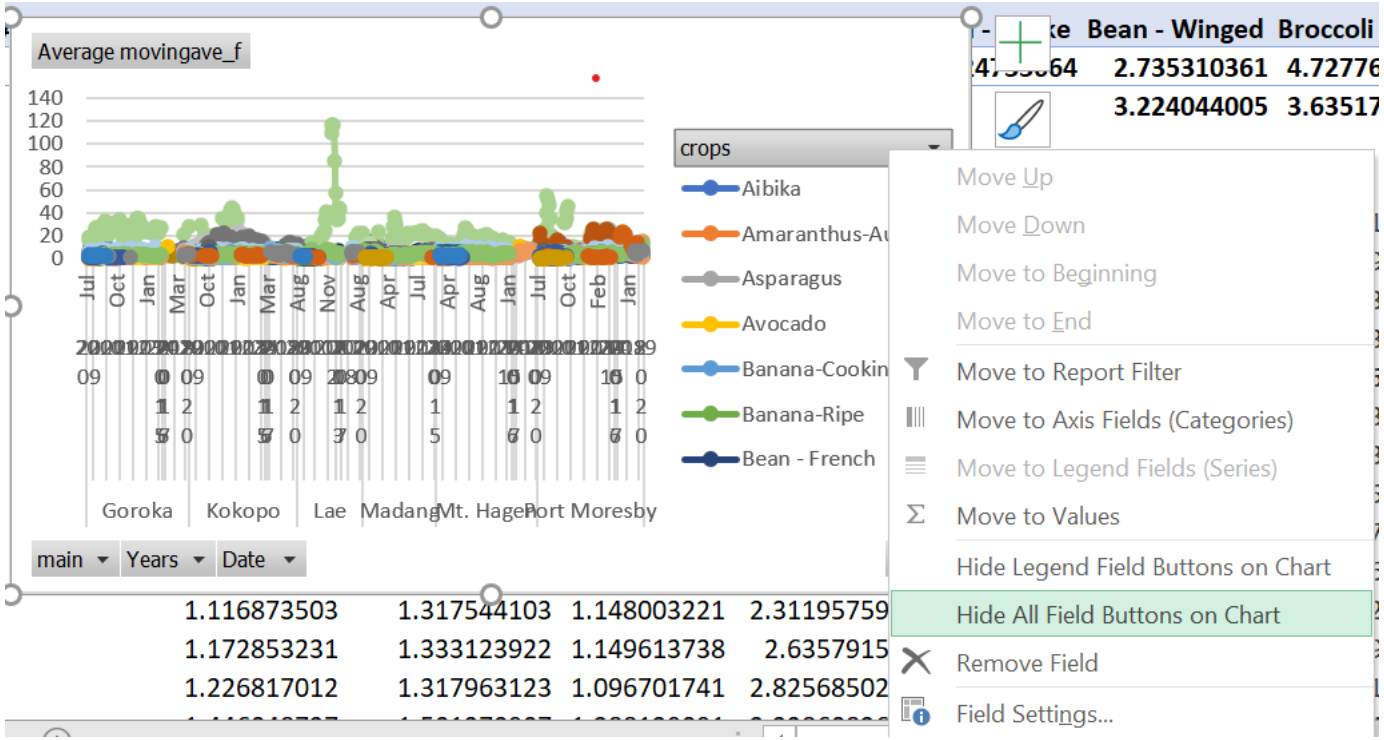
Under **PivotTable Analyze** tab press **PivotChart** select line chart



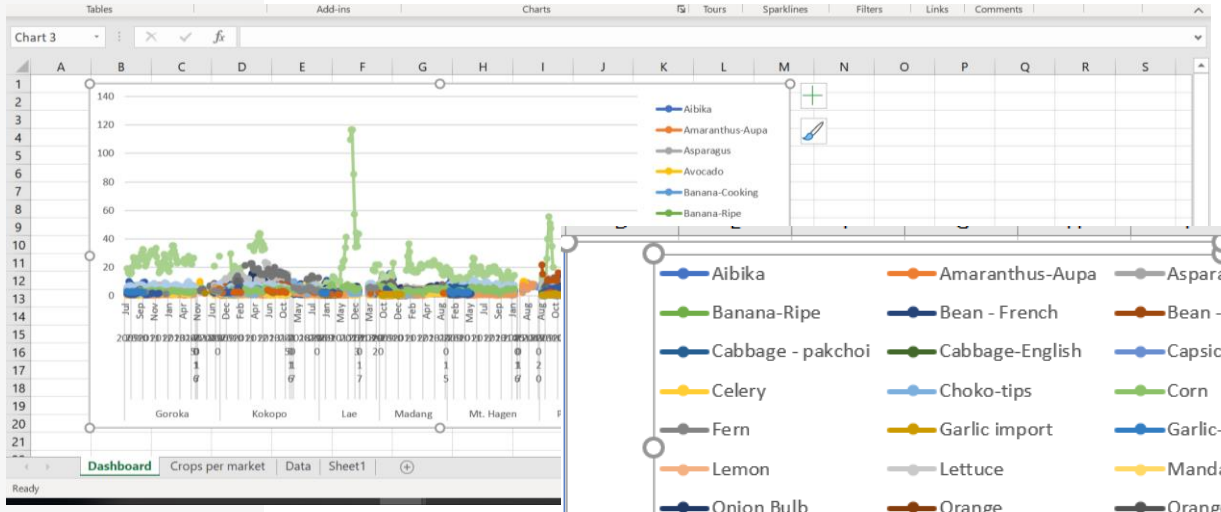
- Under PivotTable Analyze tab press PivotChart
- Select Line with Markers chart, then click OK.

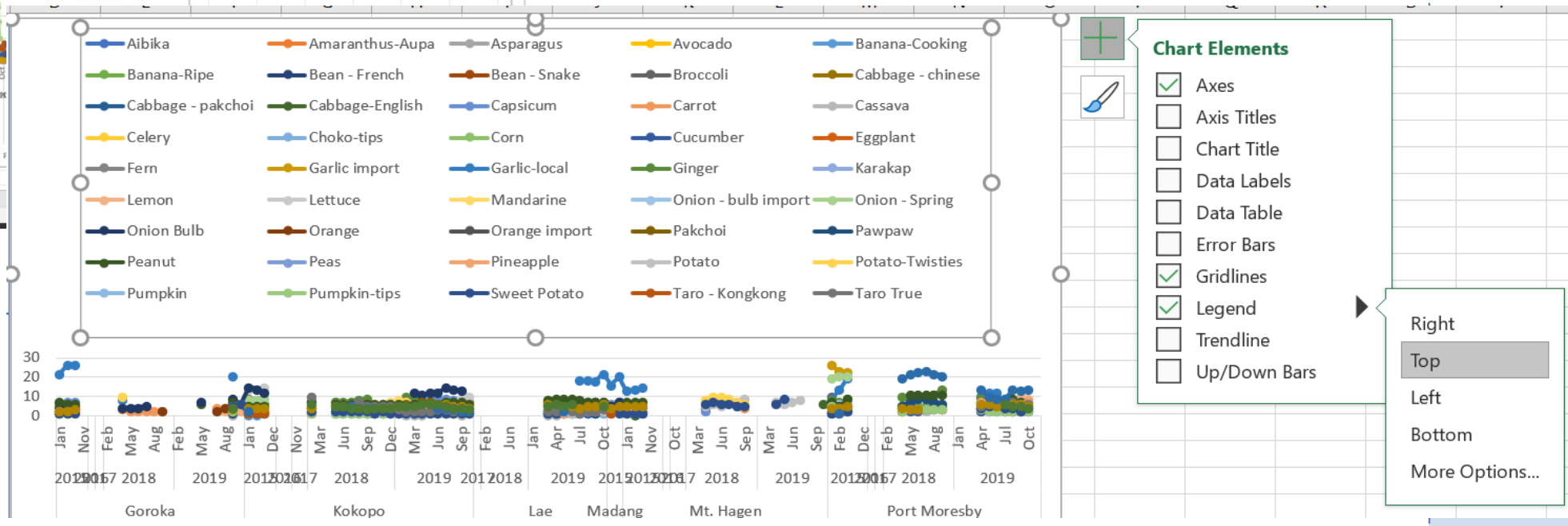


- Instead of the default filer automatically generated with PivotChart, later on this exercise we will create slicer, so for now hide the filters from the chart
- To hide all filters, right click on one of the filter on the chart and press ‘Hide All Field Buttons on Chart’
- Cut and paste the chart to a new sheet (rename the sheet ‘Dashboard’)



Pivot chart on new sheet (dashboard)





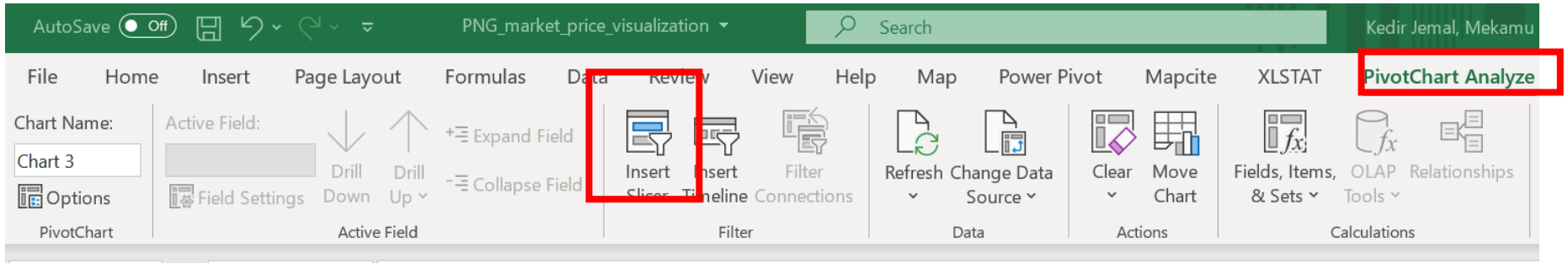
Change the legend position to top

Create slicer

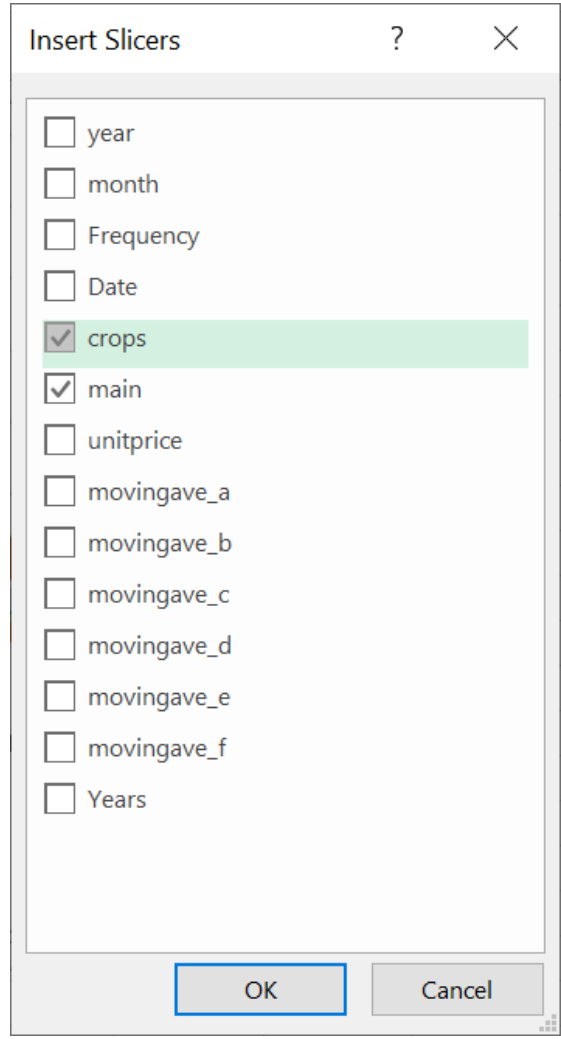
- Slicers make filtering data in PivotTables easier that regular filter
- Slicers are basically just filters, but they're easier and faster to use, allowing you to instantly pivot your data
- Unlike filter, a slicer clearly labels the filter that is applied and provides details to easily understand the data that is displayed

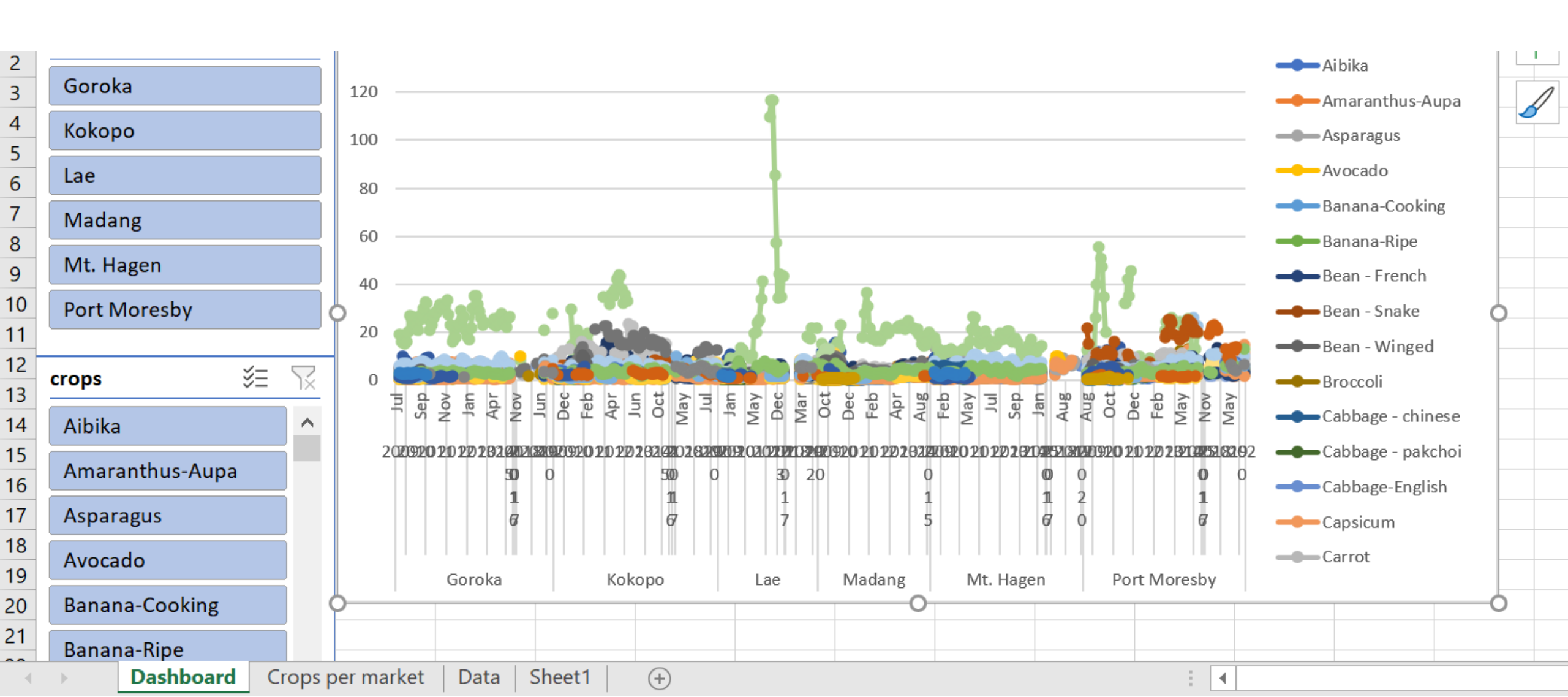
Add slicer

- Select or highlight the pivot chart or any cell in the PivotTable
- From the PivotChart Analyze tab, click the Insert Slicer command.



- A dialog box will appear. Select the *crops* and *main* (market) field, then click OK.





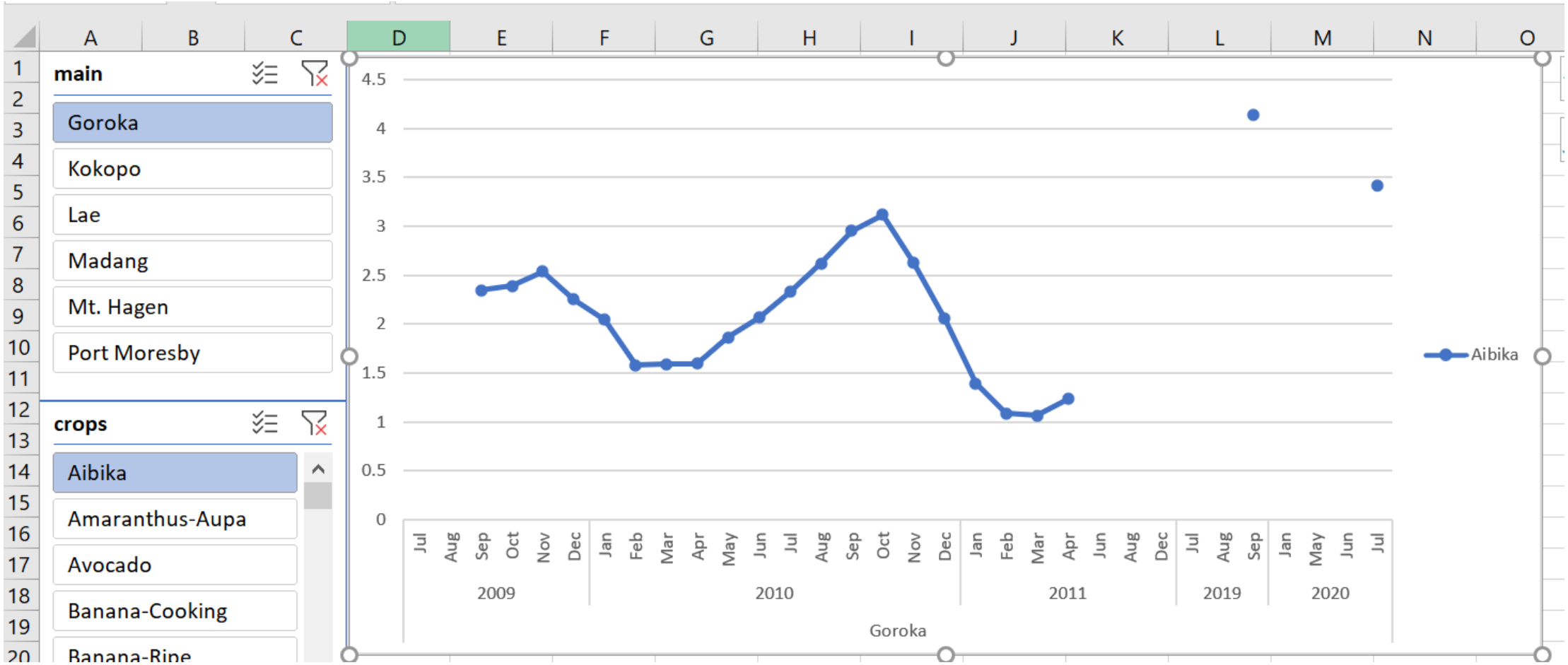
Each selected item will be highlighted in blue. The slicer contains a list of all markets and crops are currently selected.

- Just like filters, only selected items are displayed on the PivotChart

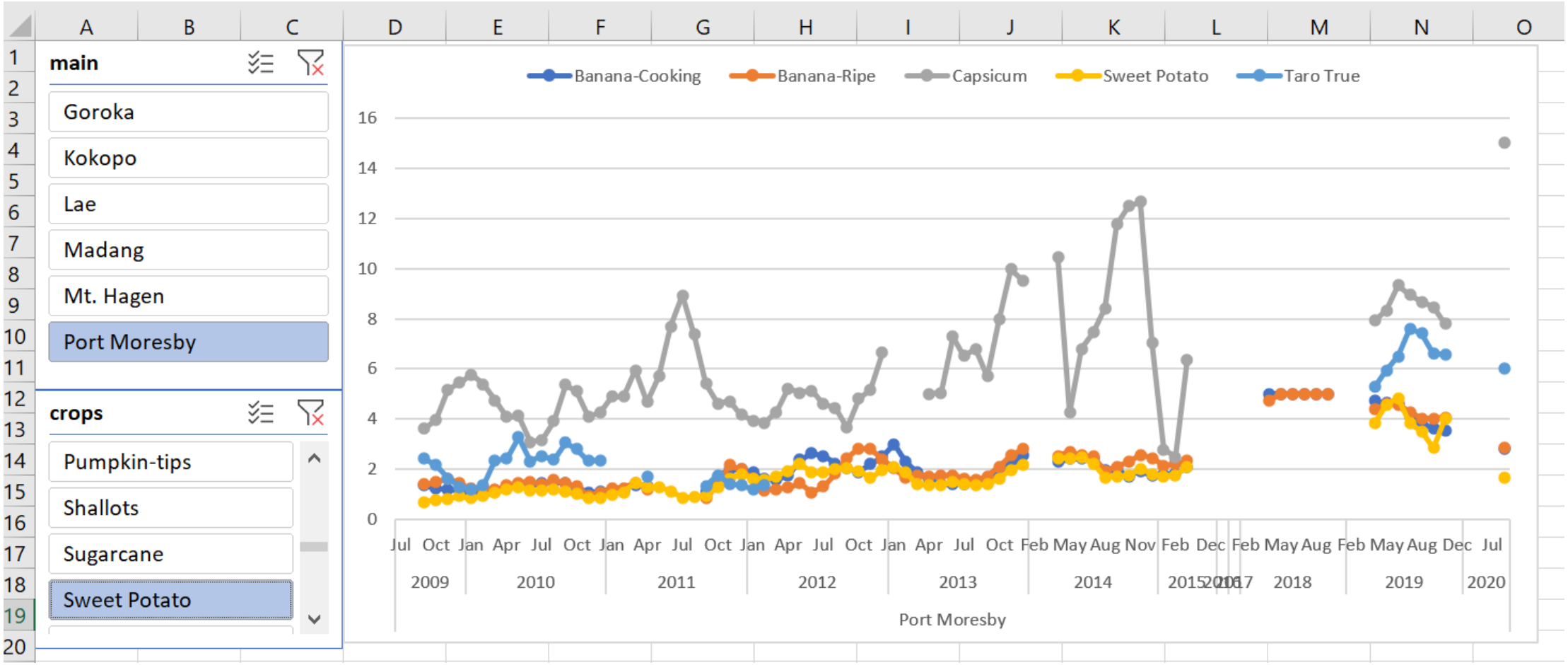
- When you select or deselect items, the PivotChart will instantly reflect the changes

- Since the PivotTable organized to best display multiple crops per market, try selecting one or more crops and a single market. To do so press and hold the Ctrl key on your keyboard to select multiple items from a slicer

Price of Aibika in Goroka market

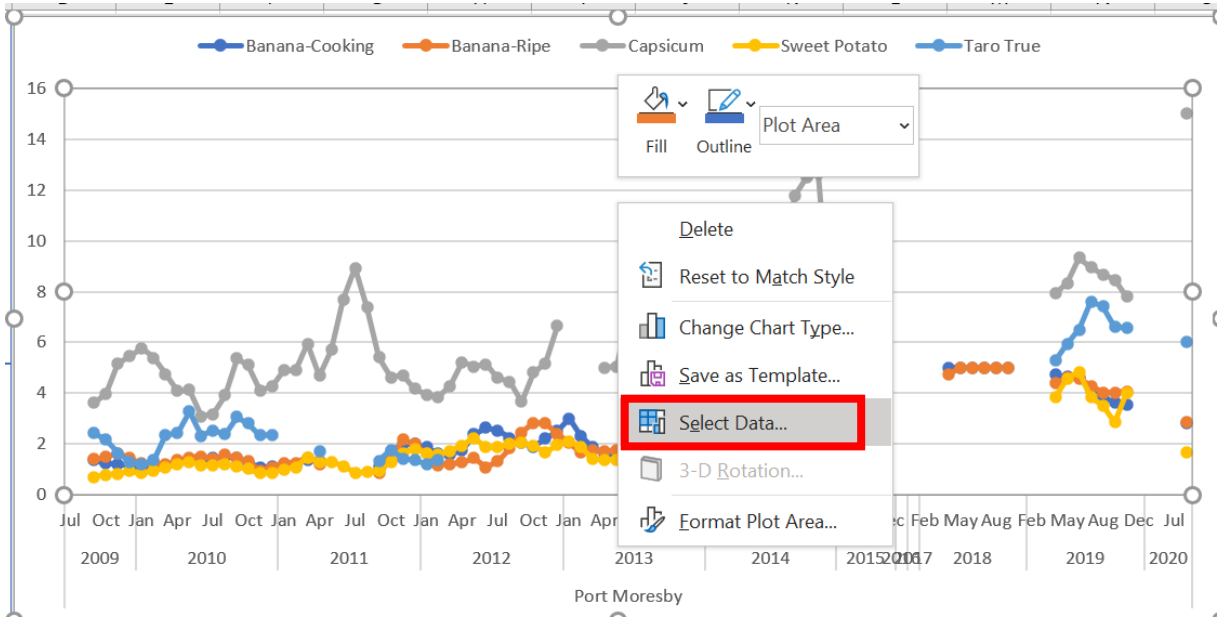


Prices of Banana-cooking, Banana-Ripe, Capsicum, sweet potato and Taro true in Port Moresby

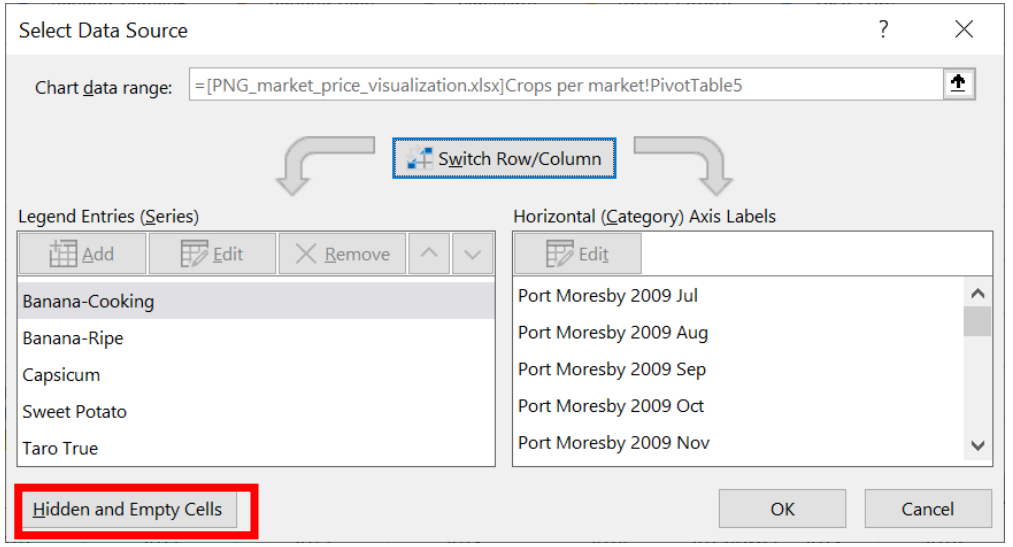


- You may have noticed discontinuity or gaps on the line graph. To connect data point with line change the settings

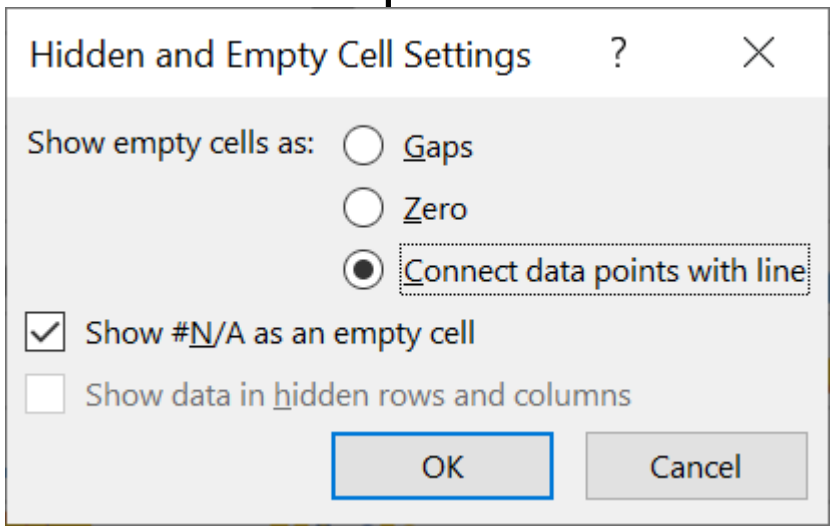
- Right click on the chart, click Select Data



- On Select Data Source dialog box click Hidden and Empty Cells



- On 'Hidden and Empty Cells settings click 'Connect data points with line'



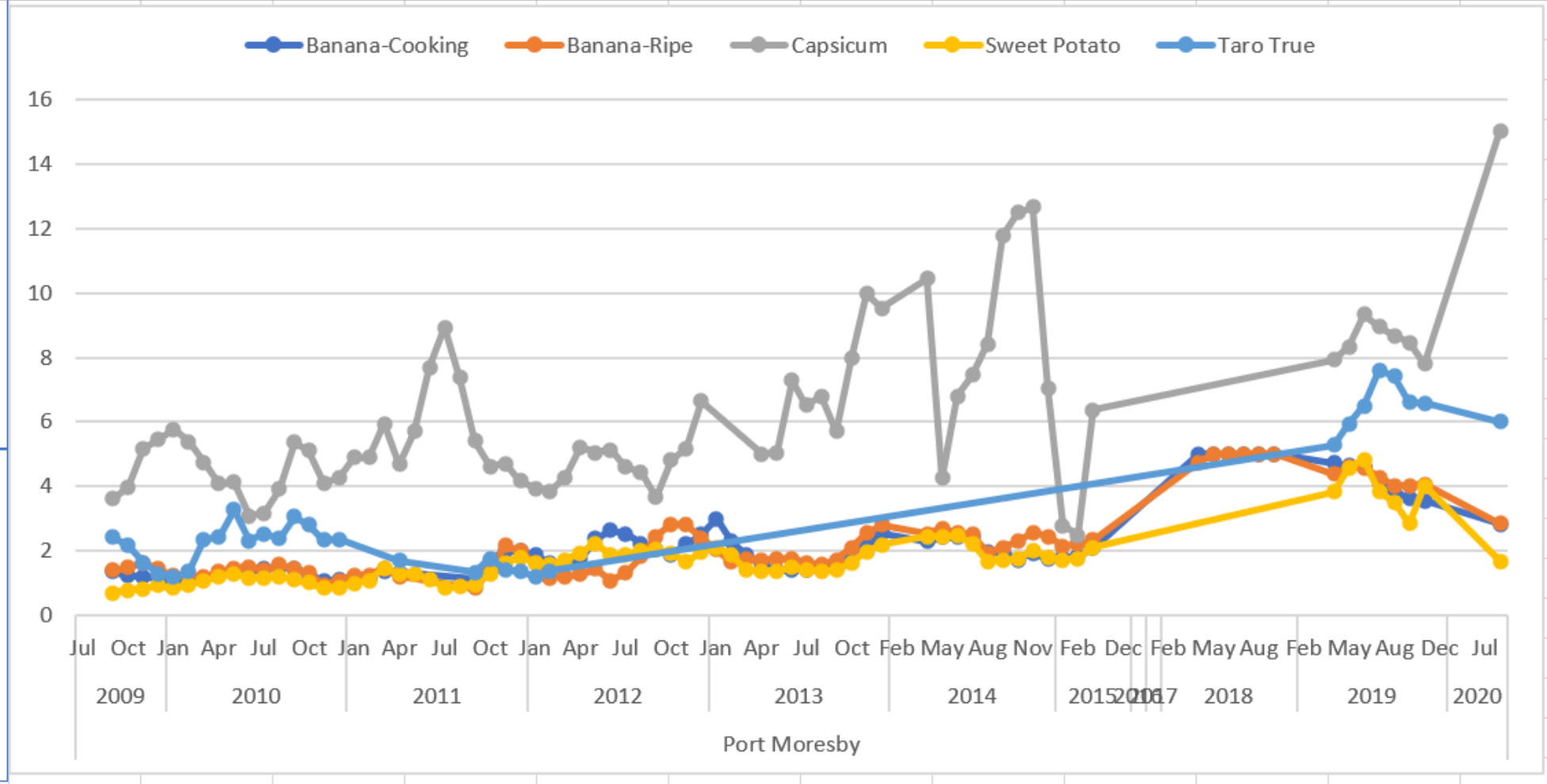
Q19

main

- Goroka
- Kokopo
- Lae
- Madang
- Mt. Hagen
- Port Moresby

crops

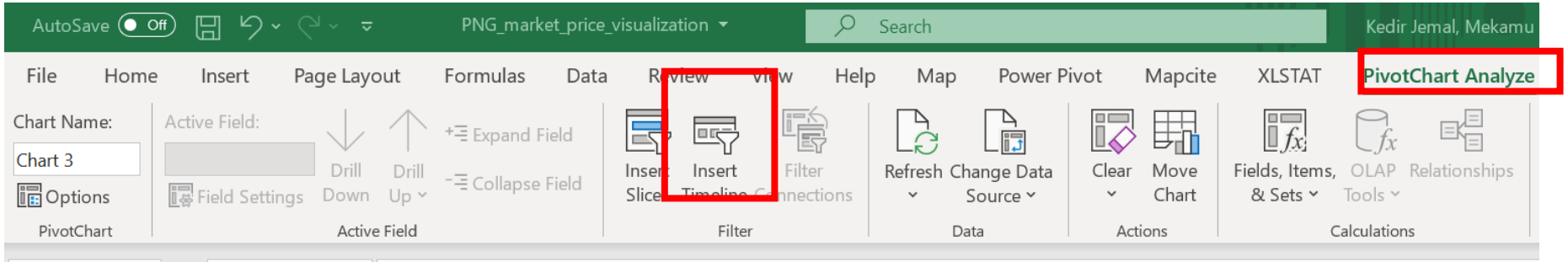
- Pumpkin-tips
- Shallots
- Sugarcane
- Sweet Potato

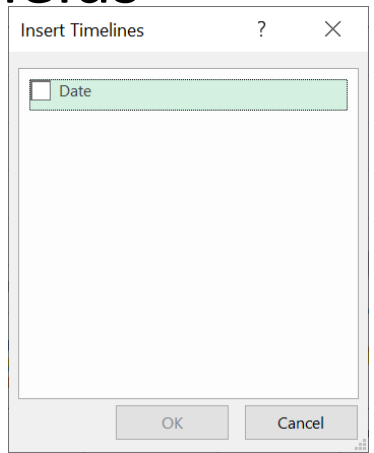


Dashboard | Crops per market | Data | Sheet1

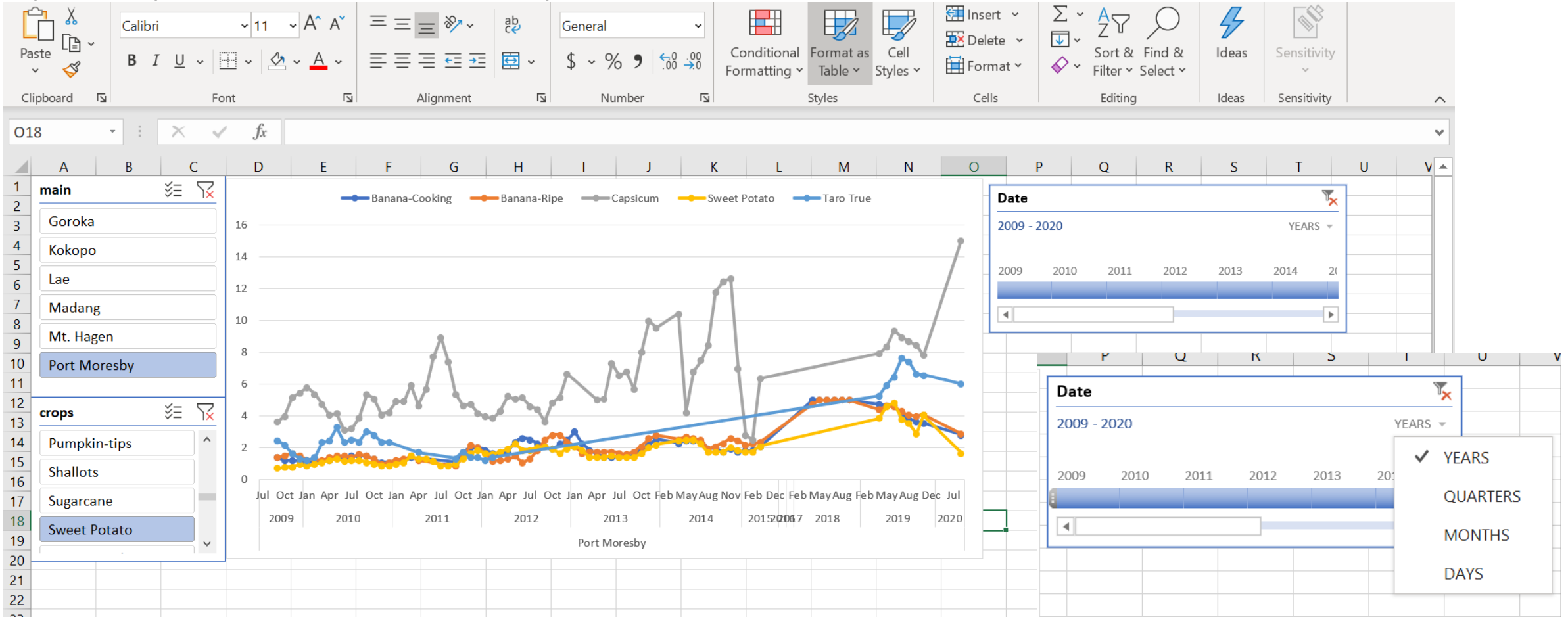
Create time Slicer

- Apart from playing around with filters to show dates, you can now use a PivotTable timeline.
- It lets you filter by time and zoom in on the period you want
- Much like a slicer you create to filter data, you can insert a timeline once and keep it with your PivotChart
- Click anywhere on the pivot chart to show the PivotChart tools
- Click PivotChart Analyze and click on Insert Timeline
- In the Insert Timelines dialog box, check the boxes of the Date fields and click OK





With timeline, you will be able to filter by a time period in one of four time levels (years, quarters, months, or days)



- Drag the timeline scroll bar to the time period you want to display
- In the timespan control, click a period tile and drag to include additional tiles to select the year range you want.
- Use the timespan handles to adjust the year range on either side.

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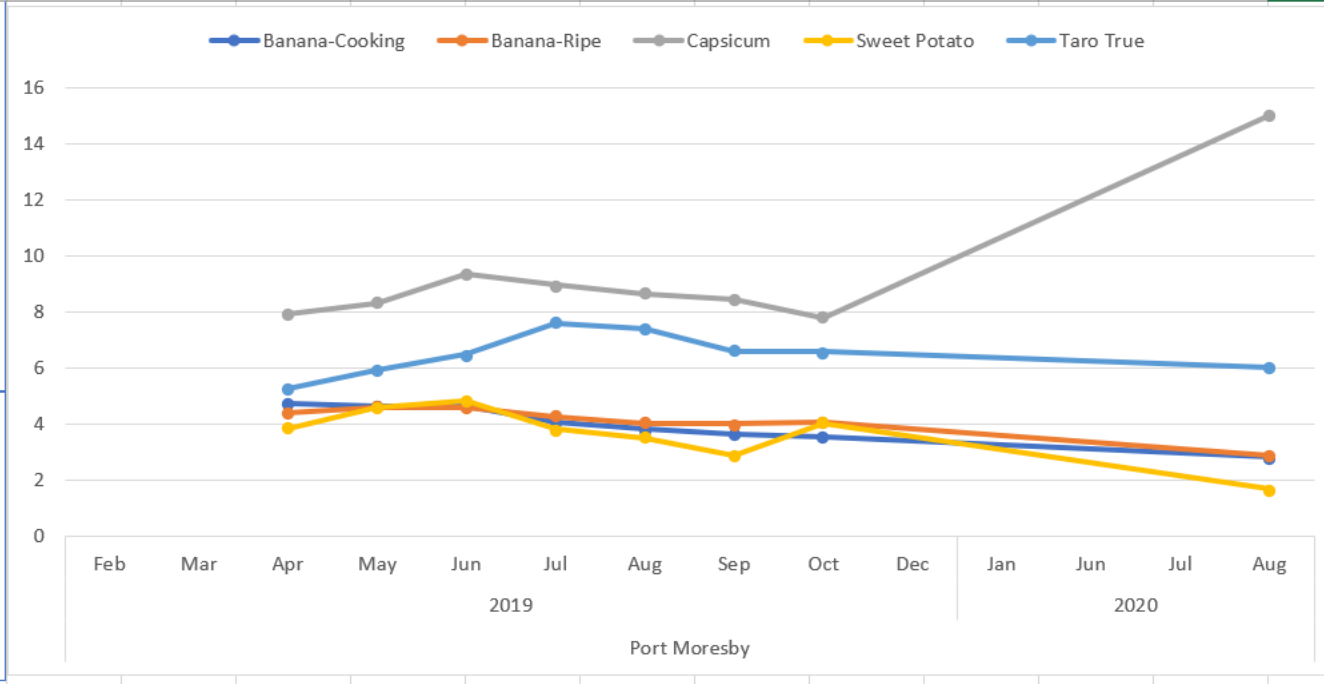
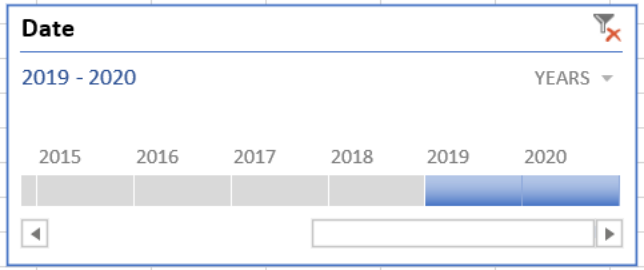
Clipboard Font Alignment Number Styles Cells Editing Ideas Sensitivity

O18

main
- Goroka
- Kokopo
- Lae
- Madang
- Mt. Hagen
- Port Moresby

crops
- Pumpkin-tips
- Shallots
- Sugarcane
- Sweet Potato





Dashboard | Crops per market | Data | Sheet1

90%

Exercise

So far, we have created PivotChart that shows prices of multiple crops in a single market over time.

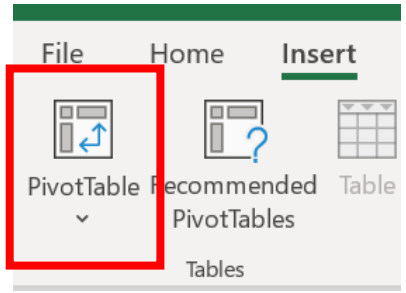
Following similar steps now it is your turn to setup a PivotTable that shows price of a crop across multiple markets.

At the end you will be able to show the following graphs by changing the selection on the slicer and time-line

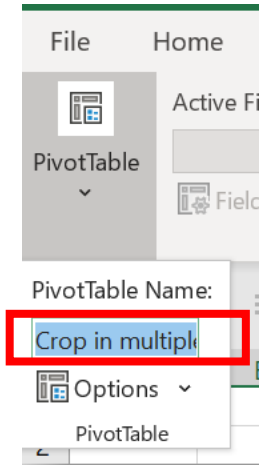
- Price of Sweet potato in POM, Goroka and Lae [
- Price of Pawpaw in Lae
- Price of Taro in POM and Lae

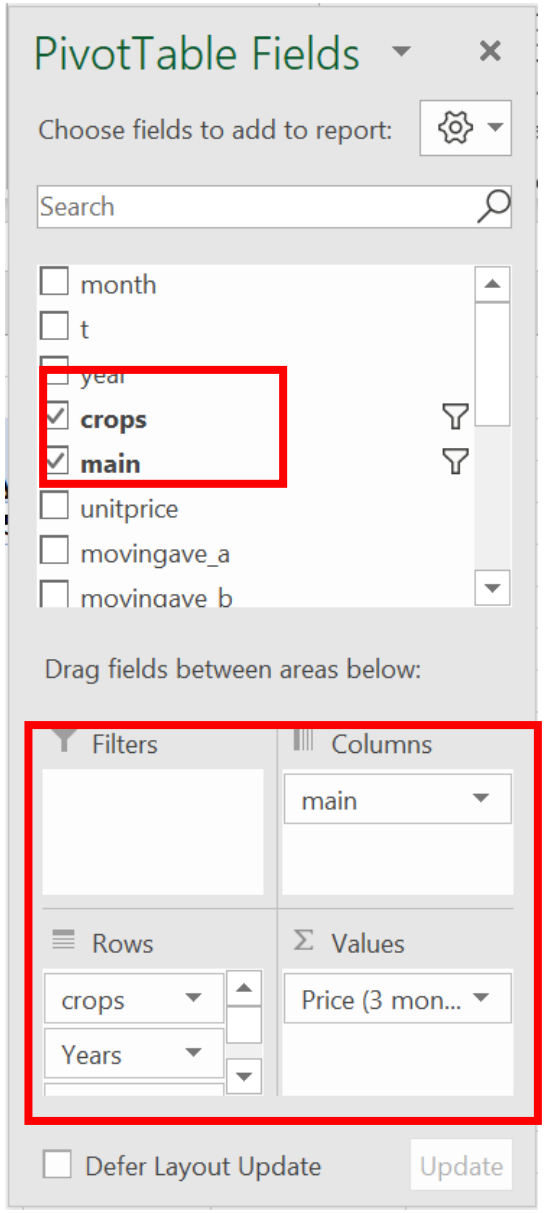
Steps to follow:

- While in Data table sheet click **Insert** from the main ribbon



- Click PivotTable
- Rename Pivot table to “A crop in multiple market”

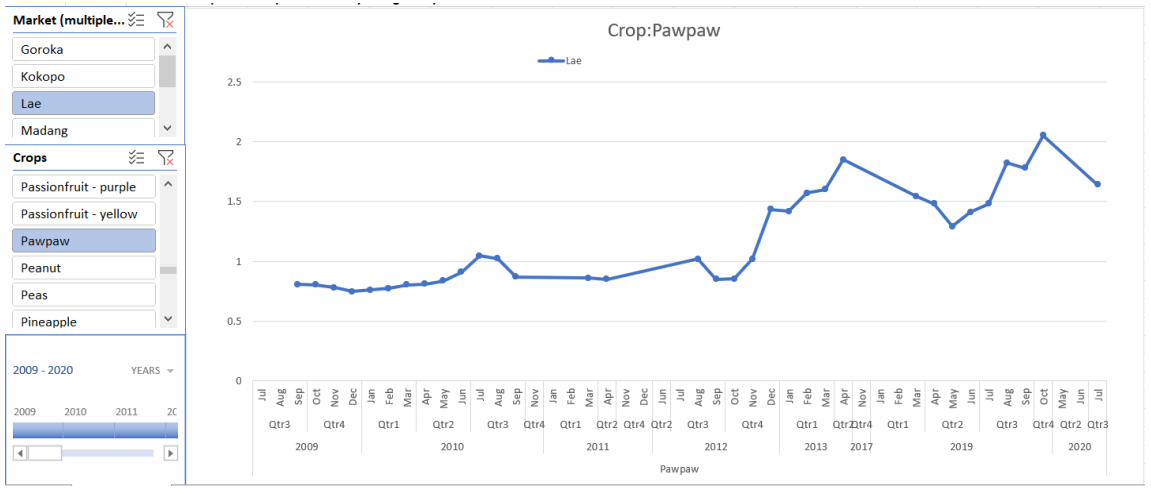




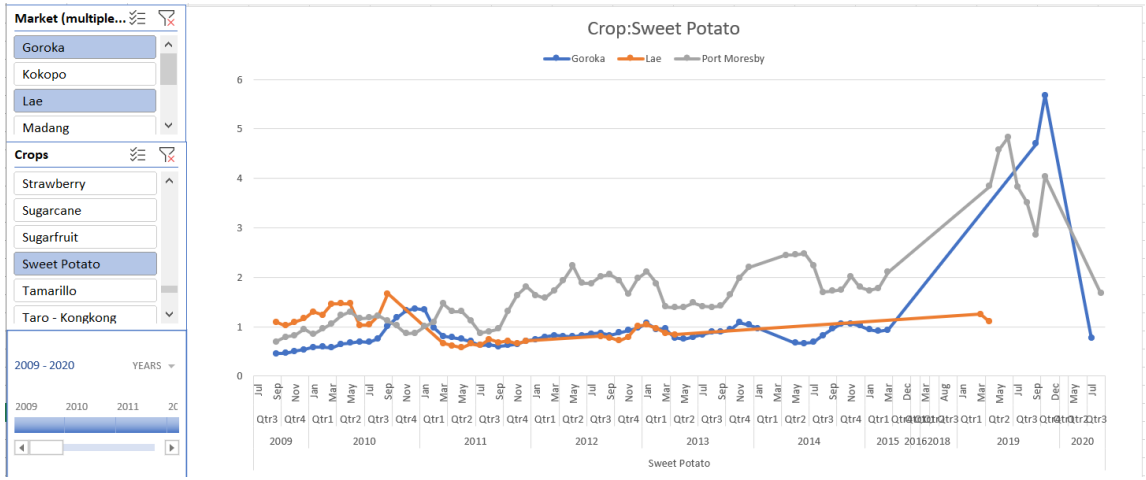
- Drag *crops, date* variables to ‘Rows’ field; *main (market)* to ‘Columns’ and *movingaveg_f to* ‘Values’ field
- Create a line with market from PivotChart, remove the filter from the chart; cut and paste on dashboard
- Select your chart on the dashboard and insert slicer and timeline

Your graph would be look like the following

Price of Pawpaw in Lae



Price of Sweet potato in POM, Goroka and Lae



Price of Taro in POM and Lae