

Instructions for Using Planting Calculator

The Vineyard Financial Associates Planting Tool is a free utility to help you make planting decisions. It is based on Microsoft Excel's Solver Add-In. If you are unfamiliar with Solver, then the first thing you need to do is install it, which is mercifully easy. This help file will walk you through how to do that and how to use the tool. The tool comes pre-loaded with an already solved example to help explain how it works in a concrete fashion.

Depending on your familiarity with Excel, it should take you between 0 and 30 minutes to become fully familiar with the tool, which allows you to decide an optimal mix of plantings for your vineyard, based on a variety of factors, such as risk, benefits and logistic considerations.

Installing Solver

To install Solver, click the **File** tab, choose **Options**, and then click **Add-Ins**. In the **Manage** box at the bottom of the dialog box, select **Excel Add-Ins** and click **Go**. Select the Solver Add-In check box in the Add-Ins dialog box and click OK. After Solver is activated, you can run Solver by clicking **Solver** in the **Analysis** group on the **Data** tab.

Orientation

This sheet is color-coded. Each color indicates a different type of cell:

- **Green cells** are the output. Solver will adjust these within the parameters you give it to provide an optimal mix of plantings. There's no need to mess with these.
- **Red cells** are the input cells. You will enter information into these cells to give Solver your parameter, so it can understand what you need.
- **Grey cells** are labels. Don't mess with them, unless you want to customize the sheet. For instance, you might want to change "Benefit" to "Expected Return" or "Risk" to "Rhône Varieties." Come back to this thought after you understand how this thing works.
- **Orange Cells** are summary cells, they show the sums of the columns above them, except for E17, which shows the total predicted yield and G17 which shows the total predicted "Benefit." If you mess with these cells, you'll break the worksheet, so they're locked.

What to Put Into Each Cell

- **Red Column (A3:A16):** Enter a 1 if the grape is red. Other cells can be left blank or you can put in a 0. I like to put in a 0 for whites and leave them blank if there is no grape it is referring to.
- **Variety Column (B3:B16):** Put the name of the grape. This need not be a variety, it could be a clone or even a rootstock or an orchard crop, if you want. Just leave unused cells blank or put in a placeholder, like they have now, and set their plantings to a minimum and maximum of 0 and 0 in the next two cells to the right.
- **Min (C3:C16):** If you have a minimum amount of acreage you want for this variety, type it in here. In this example, the grower wants at least 10 tons each of Chardonnay and Pinot Noir.
- **Max (D3:D16):** Here you can cap your planting to any variety, so as to reduce exposure to market shifts or for logistic reasons. Remember that if you just leave a 0 in here, then Solver will never tell you to plant any of this variety. If you don't want a cap, just type in the total number of acres available here. In this example, the farmer is not worried about planting too much

Chardonnay, Sauvignon Blanc or Pinot Noir, but does not want to be over-planted to specialist varieties. Make sure none of these numbers are less than any of the numbers in the Min column or Solver won't work. If you want to plant a specific amount of something, just make the Min and Max match.

- **Yield per Acre (E3:E16):** If you have a maximum, total yield you can handle, use this column to put your expected tons to the acre. If not, put zeroes all the way down. In this example, there is a maximum yield, but it does not end up being a limiting factor. You may only need to limit early- or late-ripening varieties. In that case, just assign a zero to everything else.
- **Risk (F3:F16):** This is a column that allows you to assign a rating of how risky a variety might be to plant and then keep that total risk profile under a cap. In this case, the grower is using it to limit the total combined plantings of Barbera and Sangiovese.
- **Benefit (G3:G16):** Ideally, this would reflect your discounted, forecast operating cash flow from each variety, but you can measure benefit however you would like. The simplest useful thing to put in here could just be a projected profit per acre.
- **Total Acreage (C18):** Just enter the total acreage to be planted.
- **Minimum Viable Planting (C19):** You may not want to consider planting a block less than a certain size. Put that size here and Solver will rule out any outcomes that recommend such plantings. Here, the grower does not want any blocks below 5 acres.
- **Max Red (C20) and Min Red (C21):** You can use these cells to set your maximum allocation to red and whites. For instance, this grower wants to make sure that he does not plant more than 60 acres to either white or red, so he sets the min and max to 40 and 60, respectively.
- **Max Risk (C22):** Remember when we assigned risk factors to a couple varieties? This is where you put the cap. If you don't need to use this - and, remember, you can manually limit each variety - then put a zero in it, just make sure that you've also zeroed out the risk column.
- **Max Tonnage (C23):** This really works the same way as Max Risk. If you zero it out, make sure you've zeroed out cells F3:F16.
- **Min and Max Varieties (C24 and C25):** You can use these tabs to indicate a minimum and maximum number of varieties.

Okay, How Do We Actually Run the Thing?

Now that you've got all of your parameters in, just click on the **Data** tab and select **Solver** from the **Analysis** group (usually the right-most group.) You shouldn't have to mess with anything, just click Solve and Solver will figure out the way to maximize the total "Benefit" within the other parameters you gave it. It will then let you choose if you want to keep the new results, which you likely do.

If you get an error message, it is probably an issue with the parameters you gave it. If you get negative numbers, then check the checkbox in Solver that says "Make Unconstrained Variables Non-Negative." Another issue that can throw things off are the radio buttons at the top of Solver. Make sure that "Max" is selected. Also, if you get an error message about linearity, then make sure that the pull-down menu for "Select a Solving Menu" is set to GRG Non-Linear.

If you want to customize this and mess around with it, I would recommend making a second copy to practice on, so you don't mess up the first one.

