GUIDE TO USING THE CROP PLANNING TOOL

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To locate and use the tool, visit:

https://wordpress.evergreen.edu/tmtaa-portfolio-w21-caleb-p/crop-planning-tool/

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Introduction:

Crop planning can be a raw and time-consuming process, but many farmers/gardeners find themselves completely lost without a plan, and as the scale of growing increases, so does the necessity of having a crop plan to follow throughout the season. Winter is the growers time to recuperate, but it is also the time when most people tackle their crop plans as they anticipate and prepare for the coming season. Once the crop planning is done, you have essentially planned out the entire growing season, and now it's just a matter of trying to stay on schedule! There are many ways that gardeners and farmers go about doing their crop planning and if you have a method that is comprehensive and makes sense to you, then stick with what you know. Some growers like to begin with a seed order and then build their crop plan from the seeds selection that they have made, others like to start with the plot or field that they have access to and build their crop plan based on the space that they have to fill. This planning tool assumes that you have your desired crop varieties chosen (but not necessarily purchased) and that you know the dimensions/layout of the space that you have access to.

I was taught to do my own crop planning in Excel and have always appreciated how Excel can simplify the whole planning process, saving a lot of time writing and re-writing the same info over and over again. Excel also allows for the use of equations and functions to be formatted into cells, saving even more time by auto-filling certain sections from the information that you have entered into the spreadsheet. Because of all this, I decided to create this crop planning tool within an Excel spreadsheet that can be independently downloaded and then used, altered and/or improved anyway that the user sees fit. To find the tool, follow the link on the title page - this will take you to where the tool may be downloaded.

I formatted the crop-planning tool with the hopes of making it as easy to understand as possible, but I have created this guide so that any questions that do arise can hopefully be answered within these pages. The guide has been broken into sections which correspond to the individual sheets of the crop planning tool, breaking down in detail the information that is needed to complete each section of the crop plan. When first opening the tool, you will notice that it opens up to a sheet titled: '*Your Crops';* at the bottom of the sheet, you will see the individual tabs that relate to the different aspects of crop planning, those sheets are as follows: **[** ***Your Crops, Field Layout, Transplants, Direct Seeding, Greenhouse Seeding, Harvest Yields].*** The crop data that has already been entered into the

tool is a real-world example of the crop plan that I will be using for the coming growing season. Feel free to explore the sheets and try to gain some clarity as to the overall arc that you will be following when using this tool. When you are ready to begin entering your own data, go slow and make sure that the dates and information make sense to what you can do within your dimensions as you move along through the process – it always helps me to make a crude map in order to visualize how the spacing will work out in real life. Remember that you have this guide to help answer any questions along the way, happy growing!

Using the Tool

The order in which the sheets are laid out are the order that I naturally follow when doing my own crop plan and I suggest doing them in the same order. As you navigate throughout the sheets, notice how each heading is either color coded with Red or Green. The columns that have a red header are the columns that you will be entering your own specific growing information into, this includes your desired crops, crop varieties, days to maturity, etc., The columns with green headers are locked cells (can't enter info into them) that contain equations that will automatically pop-out numbers and dates once the appropriate information has been entered into the red colored columns, these columns can be unlocked if needed but this presents the risk of losing or altering the equations that allow for the green cells to auto-fill. Many of the sheets contain a lot of the same information and to save time, this information can just be copied and pasted when you move from one sheet to the next. As you progress through the crop planning, be sure that you are entering data using the same units that correspond to the column title.

The final sheet titled "Harvest Yields" is a tab that contains generalized characteristics of many of the crops that you may be growing. I included this tab as a resource to help you find some of the info that you will need to fill certain columns, such as the column "Yield per Row Foot" in the Transplant sheet; the data needed to fill that column can all be found in the Harvest Yields tab. This has also been locked because you won't need to enter any info into this sheet.

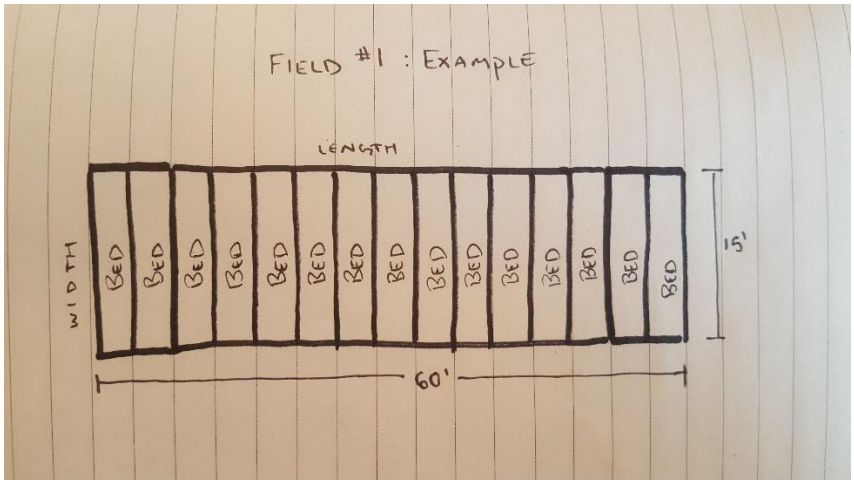
Sheet 1: "Your Crops":

Filling in this sheet is rather straight forward. The columns are titled **[Crop, Crop Variety, DTM, Spacing (in), TP,DS].**

Once you have begun making decisions on the **crops** and **crop varieties** that you are interested in growing, you can begin to enter them into this first sheet. **DTM** or Days to Maturity for your specific variety is often included on the seed packet or within the website that you are buying your seeds. **Spacing** in inches is the amount of space that you would like to have between each of your plants of a specific variety, this info is also often included on the seed packets or on the website, but you can use whatever spacing you would like. **TP/DS** stands for transplant or direct seeding, this column is asking you whether you are going to be transplanting or directly seeding that specific crop variety into your field.

Sheet 2: "Field Layout"

The Field Layout tab shouldn't include any specific crop information but rather only information about the physical growing space that you are planning to use. This sheet also makes a few assumptions that you should be aware of: 1st, this sheet assumes that you have access to your growing space and that you know the dimensions of the field. 2nd, it also assumes that you know what you'd like the sizes and orientation of your beds to be. Here is a visual aid:



Example of a field layout map

You may want to have your beds span the width of the bed (like in the example above, or you may want your beds to span the length of the bed, either way it is still utilizing the same amount of space, one just gives you more beds than the other. The 3rd and final assumption for this sheet is that if you are including walking paths in your field that they are included in the **Bed Width,** so if you are planning on having 36" wide beds with 12" walking paths, the **Bed Width** would equal 48".

Sheet 3: "Transplant"

**Remember that this is only a guide and assumes that we are growing in optimal conditions. As the season progresses and the days become shorter, the days to maturity for all of your crops gets longer and longer. **

This sheet should only contain crop varieties that you will be transplanting from a greenhouse to the field, all crop varieties that will be directly seeded should be left out of this sheet as they will be addressed later in the crop planning.

Now this is where we begin to get some interesting, real-life information in return. You may want to begin by copying and pasting the Crop, Crop Variety, and DTM into their corresponding columns based on what you entered into the 'Your Crops' tab; add the harvest unit that you will harvesting the **crop** in (head, lb, bunch, etc.) to the Crop column. Keeping the same unit for a specific crop throughout the crop planning is important as you start to plan out your desired harvest amounts, and if you are planning on selling or marketing your crops, this can help you in making a comprehensive enterprise budget.

Harvest Date is the date that you want to have a mature and harvestable crop and can be entered into Excel by entering the numbered day of the month and then the first three letters of that month, for instance if you want to harvest Cabbage on October 1st, your harvest date cell would look like: '1-Oct'. Knowing the Harvest Date is an important aspect of crop planning, especially when growing crops on a schedule. It can also be used to determine your planting schedule for the season, by knowing when you want to harvest your crop, you can back-track and plan out when plants need to be sown to try and reach maturity by your projected harvest date. If you plan on doing multiple plantings of the same crop variety, just add another separate row to the sheet for that crop variety and include the next harvest date that you plan to have that crop.

Once you have entered data into the first 4 columns, the next two columns should auto-populate with the **Calculated Transplant Date** and **Greenhouse Seeding Date.** The Calculate Transplant Date column is nothing more than the harvest date subtracted by the DTM and can be considered a guide as to when you want to transplant your seedlings to try and harvest by your Harvest Date. The Greenhouse Seeding Date is the date that seeds should be started in the greenhouse and assumes that the plants will remain in a green house for 30 days before being transplanted into the field.

The **Harvest Needs** column is the amount of crop that you want to have at the time of harvest, this should be recorded in the same units that you specified earlier.

Plant Spacing is in inches.

Yield per Row Foot is the approx. yield that you could expect from 1 row foot of that specific crop, this can be found in the Harvest Yields tab – be sure to use the same units for each crop variety.

Rows per bed is the number of rows of the specific crop that that you will have in a single bed. A row-foot is a foot of space within a single row of plants, and a bed-foot is a foot of space of all the rows withing a single bed.

SF or Safety Factor is used to account for the inevitable loss or failure of crops. When you see this in a sheet, it is being multiplied by the total in order to add just a bit more volume so that you may meet your harvest needs in the case of some crop failure throughout the season. By using a SF of 1.2, you are adding 20% more to the total, and as you get more and more confident in your growing, this number can be moved closer to 1 (don't go below 1).

By imputing this information, you receive 2 auto-populated cells for the **Calculated Bed Feet** and the **Total Plants** that you will need to transplant to meet your harvest goal.

Lastly, highlighted in Yellow and titled '**Total Bed Feet'** is the sum of all the calculated bed feet for each crop variety, telling you the total amount of space that would be necessary to accommodate all of your transplants.

You have received a large amount of information from this sheet, you are now capable of knowing approximately when you need to start your seedlings in the greenhouse, how many seedlings you will need and when to transplant them to the field, and how much field space (beds/rows within beds) each crop would need to meet your harvest needs. You have also made decisions on the quantities and timeframe of having mature crops thus giving some perspective as to what your growing season has in hold for you. If your total amount of Bed Feet exceeds the actual amount of space that you have access to, it is likely that you will need to go back into this sheet and alter your harvest needs so that they require less space. It is rare that the first draft of a crop plan is the one that sticks, and it is all to common to jump back and forth as new developments arise throughout the season.

Sheet 4: "Direct Seeding"

Where the transplant sheet dealt with all crop varieties that you will be transplanting into the field, the Direct Seeding sheet deals exclusively with the crop varieties that will directly seeded into your field; this means that there will no greenhouse period of care and no use of seedling trays and soil mixes, only the bare soil within your field. Filling out the Direct Seeding sheet will be very similar to the Transplant sheet, you will begin with the **Crop (& unit), Crop Variety, DTM** and **Harvest Date** for a specific crop variety. That information will output the **Filed Sow Date,** or the date in which you should sow your seeds into your field.

Once you have gotten your Field Sow Date, you will then enter the variety-specific information for **Harvest Needs, Approx. Yield, Rows Per Bed, SF* (Safety Factor),** and **In-row Seed Spacing,** just as you did in the Transplant sheet. This information will then provide you with your **Calculated Bed Feet** needed to meet your harvest needs, as well as a calculated **Total Number Seeds** needed to fill your Calculated Bed Feet.

The final column in this sheet is titled **Seed Weight Needed** and you will notice that it is a different color than any other cell, this is because there was no easy way for me to calculate the projected seed weight needed within Excel. If you would like to add the Needed Seed Weight to your crop plan, I have added a link that will take you to a website that has the approximate weight of multiple types of seeds; knowing your Total Seeds Needed, you would only need to do a simple conversion to calculate your Needed Seed Weight.

That link is here: https://harvesttotable.com/vegetable_seeds_per_ounce_per/

(*Note that the Safety Factor is a bit higher for direct seeding due the fact that there is often more seed failure/seed loss when directly seeding outdoors.)

Sheet 5 : "Greenhouse Seeding"

To accompany your transplant sheet, you can fill out this Greenhouse Seeding sheet that will give you data on the **# of Trays Needed** that you'll need to meet your transplanting needs. Enter the same **Crops** and **Crop Varieties** (IN THE SAME ORDER) as they are in the transplant sheet. The **# of Cells per Tray** is just that: the number of cells that your transplant trays have. The **Total Plants Needed** column in this sheet should auto-populate based on what you determined in the Transplant sheet, with that and the # of cells per tray you receive the **# of Trays Needed** to be seeded to meet your harvest goals. Including a **SF** (safety factor) here allows for some margin of greenhouse seedling failure and can be reduced when you feel more comfortable with greenhouse seedling care. Lastly, to calculate the **Total Number Of Seeds** you must enter the **Seeds Per Cell** column which is the number of seeds that you would like to put into each seedling cell of your seed tray, some farmers like to put multiple seeds in a single cell and then prick them apart and re-pot them later on, while others find this to be a waste of time – however you like to manage your seedlings, make sure that you account for differences in your crop plan.

Sheet 6: "Harvest Yields"

This sheet is only meant to be used as a guide for filling out sections of the crop plan and isn't meant to be altered in anyway, unless you want to add more information about different crops that may

not be included in the sheet already. The information within this sheet should only be used as a guide and if you disagree with any of the numbers or values, use the values that make sense to you. The harvest yields is highly subjective to the management practices that you use to grow your crops so don't be surprised if the actual yields of your crops differ from what is projected in these sheets; this is another justification for using safety factors in your in your crop planning to allow some wriggle room when it comes to harvest time!

GOOD LUCK and HAPPY GROWING!!