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A bit of Thanks

I want and need to thank my wonderful wife and editor, Brenda, who knew when to push me and realized when I didn't want to be pushed. The encouragement after all of these years of letting me do the things I do in our garden. Honey, I will get your black thumb green eventually. And to my other gardening friends and associates that I have met and mingled with over the years, and especially to those who have helped with some chapter edits: Marilyn, Steva, and Bernie thank you.

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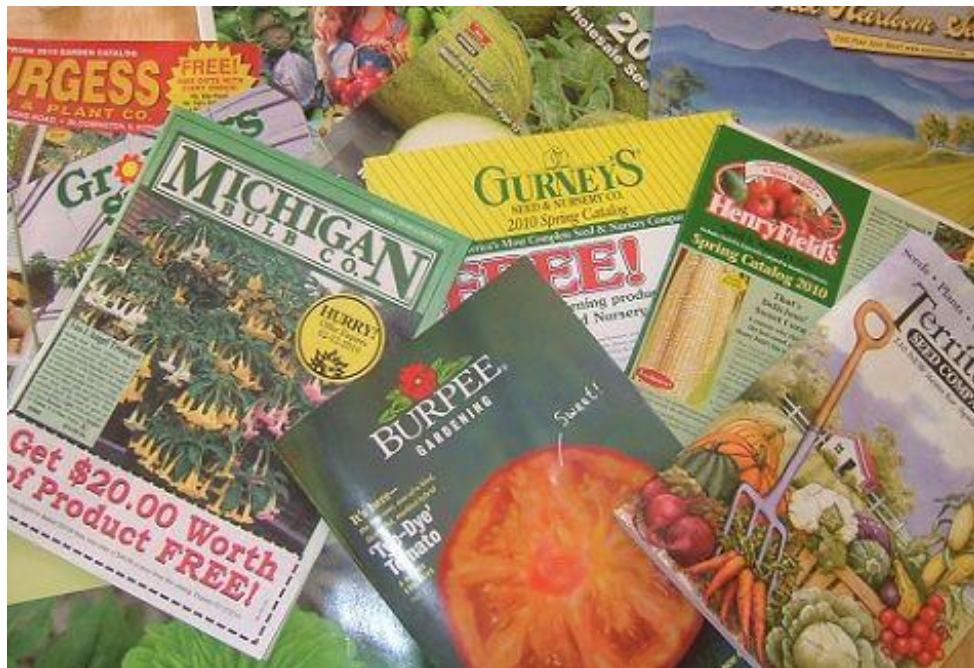
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Introduction



Don't judge each day by the harvest you reap but by the Seeds that you plant. Robert Louis Stevenson

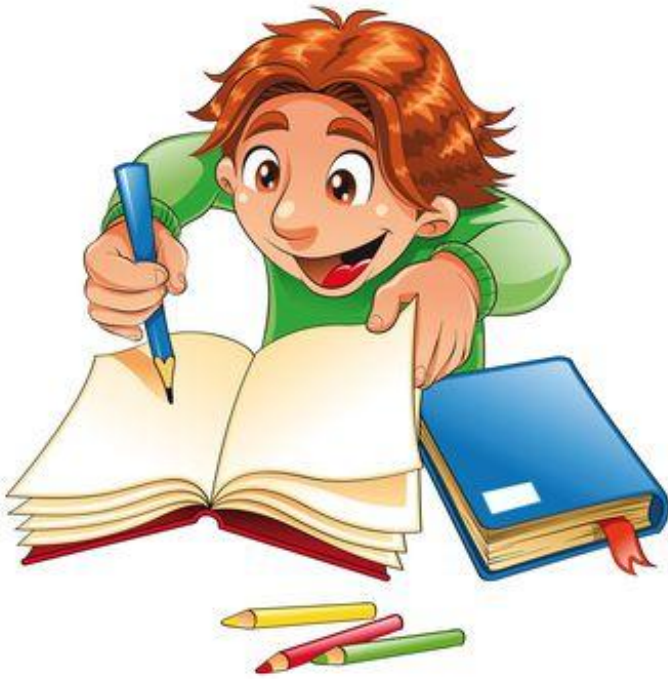
It usually seems that when the Holidays are over at the end of a year and the lights and decorations are all taken down, one's mind turns to the next season: Spring. Not only do we start thinking ahead, but we often have seed catalogs in the mail reminding us of the oncoming change in the season and that spring could only be a page away.

I enjoy looking at as many seed catalogs as I can. I start thinking of what I would enjoy growing. At first I look at the pictures, seeing many new and exciting varieties. Tried and true varieties jump out, as if saying "Hello Friend, it's been awhile." I will get lost in their pages for what seems like hours. My wife even laughs at me, for more than once she has found me asleep with the catalog resting on my chest.

For some, those seed catalogs are a nuisance, to others they are a dream of days to come sometime soon. But to most, they just might seem to be a bit intimidating. Looking at all of the possibilities on the pages of those catalogs, but yet not knowing if it is at all possible to get anything to grow. Those catalogs usually end up being a path not taken.

Let's go down that path together...

Chapter 1: Planning your Garden



"He who fails to plan is planning to fail." Winston Churchill

Write it down.

Before I get carried away with too much daydreaming of what I want to order from the seed catalogs, I get out my designated notebook or gardening journal, as I like to call it. This journal has my garden history in it. Now I know after several years of planting in the same garden plot, the dimensions of my garden. I know that I have 12 garden boxes or raised beds that are 4 x 12 foot in size. The width of my garden is 50 feet, with the approximate length of 100 feet. I do have 25 more feet at the end of my garden plot if I want to extend the size or maybe try something new.

Start your own Gardening Journal-I like to keep my journal in a 3 ring binder so I can keep adding to it. Whether you keep track year by year, or separate your information into categories, that is up to you. However, I like to keep track of it by years. I like to review last year's notes on which new seeds I grew, and hopefully refer to notes that I made on each as to whether I liked it or what I thought of those new plants that I grew last year. These notes help me with making the decisions of what I am going to grow this year. Do I really need to try anything new or should I do what I did last year? Of course I want to try something new.

You need to do this too. You need to keep your own Gardening Journal. Your first entry should read: "Today I started to Plan my Garden."

What Size is your Garden?

It is important to know the size of your Garden. Write this in your Journal: My Garden is ___X___. This will also give you the square footage of your garden. If you plant in raised beds, what size are they? If you only plant in pots or containers, how many do you have?

It is important to know the direction of your garden. Does it lay north and south or does it lay east to west? Draw out your garden, make mention of where trees are and shadows that they might create. Remember the sunlight that is shining on a dormant or winter garden will be

different than the light that will be shining on your summer garden.

What do you want from your garden? Do you just want enough to supplement a few fresh meals? Do you plan on canning or adding your harvest to your food storage? Do you have just enough room for a few plants, planting only in containers? Is your space limited for growing just enough garden produce for fresh salads or maybe planting just enough for a fresh salsa garden? These are just some of the many questions you must ask yourself when planning what size of garden you want to grow and more importantly, what amount of time will you be able to dedicate to the raising of your garden.

Chapter 2: All about seeds



Select seeds from reliable seed sources and companies.

There are many seed companies out there from which to choose. It seems that there are endless possibilities. So how do you choose? I have listed 10 of my favorite seed companies or places to buy seeds from below. You can also find over 60 seed companies listed on a free download at [Successful Gardens](#).

I like to go to my local garden center. Even though they have seeds from some of the national seed companies, more importantly they will usually have local varieties that they recommend for doing well in your area. Also be sure to check with a local Garden Club in your area.

[Jung Seeds & Plants](#)

[Baker Creek Heirloom Seeds](#) [Burpee](#)

[Park Seed](#)

[Territorial Seed Company](#)

[Totally Tomatoes](#)

[Henry Fields](#)

[Botanical Interests](#)

[Renee's Garden](#)

Most seed packets will be date stamped, ensuring high germination rates and success for your garden. They should be stamped with a sell through date of the current year, usually through the last day of August or September. However, many varieties of seeds will stay viable for several years and you are also able to store your un-used seed from year to year.

Viability of your seeds will decrease slowly over the years, especially if you store your seeds in favorable conditions, such as cool and dry. I like to store my seeds in freezer type storage bags and then inside another air tight container. Take extra precautions in areas with high humidity. I did find some old seed in my wife's grandmother's old garage, stored in old glass Mason jars. I am wanting to try growing some of those seeds to see if they germinate.

Now there are also many Seed Trading groups around the world that trade seeds amongst each other. There aren't any regulations on these groups, and there are many wonderful people out there, and of course there are the bad ones too. When trading seed, get to know your trader

first, and as always, trader beware!

When Do I start my seeds?

Knowing Average last frost date- Knowing the average last frost date for your area will help you know when to start germinating your seeds indoors. If you start your seeds too early, they may become weak and leggy, and be in poor condition when you are ready to plant them outside. If you start them too late, well then you might not have enough time for the plants to grow and produce before the killing frosts wipes out your garden. You can check with your local garden center, State University Extension Service office, or local Garden Club for your area's average last and first frost dates in a growing season.

Counting Backwards-but give yourself an extra week.

Most seed packets will indicate whether you need to start your seeds inside or if you can directly sow your seeds outside in the garden. For instance, a tomato seed packet may indicate that you will need to start your seeds six to eight weeks prior to the last average frost date. Whereas a package of carrots, might indicate that you can directly sow the carrot seed in your garden one week prior to the average last frost date. For me, I live in Wyoming and for my area, the average last frost date is May 18. For tomatoes, when following the guidelines of the seed packet, I would start my tomato seeds around the middle of March. I do know some gardeners who start their seedlings as early as the first part of February. For this very reason, it can be easy to become discouraged and this is why I don't suggest you start everything for your garden your first year. Take the time to become used to the demands of starting seeds indoors and make sure you write your observations in your garden journal.

When Do I start my seeds indoors: (Prior to average last frost date)

10-12 weeks: Onions

8-10 weeks: Celery, Peppers, Tomatoes

6-8 weeks: Most herbs should be started indoors and then transplanted into your garden.

5-7 weeks: Cauliflower, Cabbage, Brussels Sprouts, Chinese Cabbage

4-6 weeks: Leeks, Broccoli

2-4 weeks: Artichokes, Watermelon, Cantaloupe, Cucumbers, Melons, Squash, Pumpkins, Eggplant

Direct sow into your Garden:

There are many vegetable seeds that can be planted directly out in your garden. And as you will see from the list below, it seems that I have double listed some varieties. Cucumbers, squash and melons can go through a transplant shock if they are started indoors and then planted into the garden. The transplant shock refers to the aspect that the growing plants, once they have been taken out of their pots and planted into the garden, can take up to two weeks to start growing again as they recover from the shock that has been inflicted to their system. Those same plants, when started from seed in the warm soil of your garden, after all dangers of frost are past, will germinate and will have started catching up to the transplanted plants.

One year I even put this to a test. My results were the same. That is why it is important to plant squash and melon vegetables in peat pots that can be planted directly into the garden as not to

disturb their root system. I talk about peat pots in a later chapter.

The following vegetable seeds can be planted directly into your garden.

3-5 weeks prior to last frost: Onions, Peas, Radish, Turnips, Beets, Parsnip, Spinach

2-4 weeks prior to last frost: Swiss Chard, Mustard Greens, Collards, Kale, Kohlrabi, Turnips, Carrots, Lettuce (both leaf and head)

After last frost date: Rutabaga, Endive, Watermelon, Cantaloupe, Cucumbers, Melons, Green Beans, Sweet Corn, Popcorn, Ornamental Corn, Squash, Pumpkins, Okra

Please note that Bean and Corn seeds are susceptible to rotting in the ground if the soil is too cool or wet. They do best planted when the temperature of the soil has warmed to a minimum temperature of 50 to 60 degrees Fahrenheit.

Chapter 3: Potting Soils



What type of soil (planting medium) is best?

Don't be fooled by the word soil. There should NOT be any dirt or soil in the planting or potting soil you buy. You will often see it labeled or referred to as a soilless potting soil, and as for a bargain soil or cheap priced bag of soil, it usually indicates a poor quality of planting soil.

Here are some key words you will find on bags of potting soil.

Sphagnum Moss: Sphagnum Moss is commonly referred to as peat moss. Sphagnum is a species of moss that contributes to the formations of peat bogs, made up of both dead and living plant tissue. Peat Moss can hold many times its weight in moisture and is widely used to aid in arid, sandy soils to help retain moisture in those growing conditions or to help loosen heavier clay soils.

For those concerned about depleting natural resources like peat moss, Peat Bogs that are used for horticultural purposes are monitored and can only be harvested at certain times of the year to help prevent over production of this natural product. Though it can be found in almost all parts of the world, horticulture grade sphagnum moss is mainly harvested in the Canadian Provinces.

Vermiculite: Vermiculite is a mineral based clay substance. It is a mined material used in many applications from fireproofing to brake pads to seed germination. The type of vermiculite that is used in potting soils and seed germination is exfoliated vermiculite that has been heated to high temperatures to create the structure that is used for growing plants. It offers a great material to aid in moisture retention and also a structure that does not compact when wet, allowing for air porosity for roots to develop. During the 1990's there were some mines that were showing high amounts of asbestos. The vermiculite that is used today in potting soils comes from asbestos free mines.

Perlite: Perlite is a byproduct of volcanoes. It is a form of siliceous rock or volcanic glass. When this volcanic glass retains moisture, prior to cooling, and then mined and re-heated to extremely high temperatures (1600 degrees F) such as in a kiln, the moisture then expands and the porous glass basically explodes, much like popcorn, creating a very porous white glass. It is used as a soil amendment to reduce soil compaction, used in potting soils, or as a growing media in hydroponics.

Organic versus Non-Organic Potting soils: Organic Potting soils will contain more products than just sphagnum moss, vermiculite and perlite. They will also add organic compounds such as worm castings, bark compost, seaweed extracts, and will have living micro-organisms in the soil. Organic potting soil can be much more expensive than regular potting soil, which is made up of natural products too, but usually are just limited to sphagnum moss, vermiculite and perlite.

Added Fertilizers: If your bag of potting soil says that it offers additional fertilizers, don't buy it for that very reason. The small amounts of fertilizer mixed into the potting soil, generally offer no benefits to growing plants, and generally by the time that the roots are able to utilize any fertilizer, it has dissipated and is no longer available. I don't recommend using a potting soil with added fertilizer for your seed starting or transplanting soils.

Be careful of what you buy. A reputable garden center or nursery, will usually have a sample of their potting soils on display and available for you to look at and would allow you to run your fingers through it and to see and feel the texture of the soil. If it is not available, ask to see a sample. Also don't be afraid to ask the employee what their garden center uses in their planting mix.

Commercial Packaged Seed Starting Mixes

There are so many planting soil options to choose from, it all depends on what you want. Since we are talking about seed starting, let's stick with the starting mixes. Seed Starting soils are generally made up of sphagnum peat moss, vermiculite, lime and a wetting agent.

Seed starting mixes will have finer ground peat moss fibers than regular potting soils. In higher quality starting mixes you might find an additional ingredient called coir or coco peat. Coir is the husk fibers of a coconut. When it is ground and used in planting mixes, it has a stronger water holding capacity than just plain peat moss. Coconut Coir is an excellent renewable resource.

When choosing seed starting mixes, I would not recommend choosing the cheapest bag available. I made that mistake once and to my surprise found rocks, sticks and dirt, (I hope it was dirt), in the bag. I ended up dumping that bag of mix out in my garden and went and bought a different bag of starting mix.

If you are starting tiny seeds such as broccoli and cauliflower, or flower seed like alyssum or petunias, it is best to use a fine seed starting mix so that those seeds do not get washed away when watered. Small vegetable seeds, such as tomatoes and pepper, or even larger seeds such as squash and flowers like marigolds or zinnias can be started in regular sized potting soil.

Peat pellets

Peat pellets, in the past, have been mainly made of a finely ground peat moss that has been placed in a mesh sack and then compressed and heated with all of its moisture removed. Now more and more of these pellets are being made with coir, allowing for better absorption and water retention.

A dimple or small impression is pressed into the top of the pellet to indicate where seeds are to be placed. You then take these dried out pellets, place them in a tray that will hold water, add water to hydrate the pellets. The pellets will then absorb water causing the pellets to swell to a size of about 2 inches in height.

The nice thing about using pellets, is that they are fairly mess free. You are able to plant the exact amount of plants you want, and you don't have to worry about disturbing their roots when transplanting outside. All you have to do is place the planted pellet directly into the hole, when it is ready to be planted outside, in the ground and backfill the soil loosely around the pellet. Don't compact the soil too tightly.

There are a couple of drawbacks to using peat pellets. After the pellets have expanded, the premade dimple can become a giant cavern for tiny seeds and the seeds can become lost. Depending on what kind of a tray you are holding your pellets in and how you water them, allow the pellets to become fully saturated, making any adjustments to the peat moss pellet. It is very easy to wash the seeds out of the peat pellets. Take caution when using these easy peat pellets to start your seeds in.

Cost on pellets can range from as low as 15 cents apiece to as much as 50 cents or higher. It usually will depend how much coir has been added to the pellets. Pre-packaged trays can also be purchased with the pellets included and then the tray can be reused year after year and all you have to do is replace the pellets.

Home Made Soil Mixes

Many gardeners like to make their own planting mixes. If you are not comfortable in doing so, there is nothing wrong with buying your seed starting mix.

Your basic mix ratios are equal parts of sphagnum peat moss, vermiculite, and perlite, all of which can be purchased at your local garden center. This can be used for most any planting mix. You can also add coir to your blend and also leaf mold or compost. Advanced gardeners will start adding fertilizers such as rock phosphate and dolomite lime, and other nutrient sources like sea kelp, worm castings and magnesium sulphate to enrich their homemade potting soil.

Homemade mixes might be overwhelming to make for some and can easily be mixed wrong, so that is why I use pre-packaged seed starting mixes.

Plain Old Garden Dirt

You might be tempted to just use plain old dirt from outside and from the garden. Whenever using dirt for seed starting purposes and repotting plants, there is a high chances that you will start growing weeds and possibly introduce fungus and pathogens to your mixes. These fungus and pathogens can very easily and quickly kill your newly sprouted seeds.

When using dirt you must sterilize it first. You can place the amount dirt you are using on a cookie sheet into a preheated oven of 200 degree Fahrenheit until the center of the dirt reaches 180 degrees Farenheight. Leave this in the oven for 30 minutes. This will kill the weed seeds, roots of weed, and the fungus and other pathogens that might be in the dirt. After it is cooled, you then can use it straight or mix with other planting materials such as peat moss.

Chapter 4: Growing Equipment



Now that you have the soil and the seeds you are going to need something to start your seeds in. I remember when I was in kindergarten, my teacher helped us plant some flower seeds for Mother's day. We filled some soil into little paper drinking cups and then placed the seeds in the cup, added water and set them in the window sill. Several days later the seeds germinated and they started growing. It was a great day! I still get that thrill of seeing the new seedlings emerge from the soil today, but I have advanced my seed starting methods from the little paper cups to seeding trays and other pieces of equipment.

Growing Containers

You are able to find many container options to start your seeds in. But you will want to be careful because, just like potting soils, not all containers are suited for starting seeds. One very important thing to consider is that excess water needs to be able to drain away from the soil in order to prevent moisture build up which can cause roots to rot. Excess water will also allow fungus to grow causing "damping off" which is a type of fungus that will kill newly emerged seedlings.

Seedling flats

Seedling flats usually are made of a black or brown plastic material and measure 11 X 21-1/4 inches and are 2-1/2 inches deep. They usually have drain holes throughout the bottom surface, allowing for excess moisture to drain off, but you can buy them without the drain holes. Make sure you have a drip pan to catch the water or a surface that water will not damage. I place my seedling trays onto old cookie sheet pans to catch the excess water.

You can fill the flats with the seed starting soil of your choice and freely scatter the seeds across the surface of the soil. However, if you place the seeds in individual rows, you will be able to identify those seeds with an identification tag. This will allow you to start several varieties of plants at the same time in the same tray, usually only requiring one tray for seed starting. Once your seeds have germinated and have developed their true leaves, you then are able to transplant those seedlings up into a larger cell or container. True leaves are the second set of leaves to appear on a seedling. The leaves or cotyledons that first appear act as an energy source for the newly emerged seedling.

Inserts

Usually at a garden center you will also find plastic or fiber insert trays to go into the flats. These inserts will come in various combinations of cells and packs. You will be able to identify how many plants you will then be able to grow in each tray. The more common inserts will be identified as 804, 1204, 1206, and 1801. Let's use a 1204 for an example: If you were to break each pack apart in this insert, you would have 12 packs of 4 cells, or 48 plants. An 804 insert would offer 8 packs of 4 cells converting to 32 plants. And if you were to break apart an insert sheet that was called an 1801, you would have 18 packs of individual cells, or 18 plants for this one sheet.

Generally, the inserts are made of very thin plastic and once they are used it is better to recycle the plastic than to reuse the inserts. If you are careful and are able to remove your plants without breaking, tearing or damaging the plastic cells, you can re-use them next year. However, it is imperative that you sterilize the insert and also the flats in a simple bleach solution. This will sanitize the planters, killing any pathogens that might have developed, thus preventing any future fungus outbreaks.

There are more and more fiber pots or inserts that are becoming available to grow in. They are intended to plant directly into the ground so as not to disturb the roots of the plants. These fiber pots are mostly made out of peat moss, coconut husks, recycled paper and other natural things. You will also find some containers that are even made out of animal poo.

They are formed by compression and heat and come in variable sizes. The type of fiber used can also depend on how the roots will grow. I have learned that if a fiber pot has a smooth shiny slick surface, it is going to be slower for the roots to break through once transplanted into the garden. When I am ready to transplant these fiber pots, with their growing plants, into the garden, I will take a knife and make a couple of slits into the sides and bottoms of the fiber pots. Some gardeners will remove the bottom in its entirety. By doing this, it allows for unrestricted root penetration into the ground.

Flat Coverings

Flat coverings or Humidity Domes are clear plastic domed lids that fit over the regular sized 11 X 21-1/4 inch flats. They will vary in height, but most domes are about 2 inches high. These domes provide a greenhouse effect, by raising the humidity, helping with moisture control, soil temperature and seed germination. However, the domes need to be removed from the flats once the majority of your seeds have germinated. I have seen some domes that are 6 to 8 inches in height. I don't recommend these domes, because there can be too much humidity and fungus will start to grow. You aren't trying to create a terrarium environment.

Starting Kits

There are several seed growing starter kits out there, trying to simplify the choices, which might be a good place to start for some. Those kits will usually have everything you need to start, except the seeds and most do not have the soil. However, if the kit does have soil bundled into the package, usually that starting soil is dried out. Make sure that you moisten the soil before placing it into the cell inserts.

Some kits will offer the individual peat pellets rather than the cell inserts that you fill with potting soil. The flat trays will have a molded indent to hold the peat pellets, you then just add water, and the pellets absorb the water and expand to their full size. Once the pellets have expanded and you have removed any excess water from the tray, you then are able to place your seeds of

choice onto the top of the pellets, cover the flat with the clear plastic dome and then wait for the seeds to germinate.

You will notice the moisture build up on the plastic dome after a few hours. Depending on how saturated you allowed the pellets to become, you will need to check after a day or two to make sure that the pellets have not started to dry out. If they have started to dry out, just add some more water to the flat, being careful as not to wash the seeds off of the pellets. I like to use a small quart sized watering can with a long neck, allowing me to place the water closer to the bottom of the pellets.

By using the pellet trays, the plants will be ready to go outside once they have grown and the weather is cooperating. You will be able to just place the peat pellets, with the grown plant, directly into the ground and you won't have to disturb the roots either.

Larger Individual Containers

You can plant seeds into larger individual pots. But how large can you go? That depends on what you are growing. I like to use 3 or 4 inch peat pots to start my cucumbers and squash plants in. Normally, these plants will do just fine when their seeds are sown directly outside into the garden soil. However, some varieties require a longer growing time than what my area normally allows. So I will start these plants in the large peat pots, which allows for a larger root area. When placing outside, I will slice the side walls and bottom of the pot, with a sharp knife and then place the pot in its designated area in the garden. When disturbing the roots of squash plants in the transplanting process from plastic pots, the plants can experience a shock to their systems, becoming stunted and they won't grow for up to two weeks.

Chapter 5: Do you have enough light?



Seedlings need more light and brighter light than what most indoor rooms offer. And even though you might have the perfect facing window that floods your room with daylight, it is usually not enough or will last long enough into the day. Newly germinated seeds need 12 to 14 hours of bright light. That is why natural daylight needs to be supplemented. Remember in a greenhouse, daylight is usually available from sunrise to sunset. Do your windows allow daylight into your room from sunrise to sunset? Let's talk about light.

Natural Light

Natural light, or daylight, coming in from your windows is great; however, it isn't strong enough and doesn't last long enough for most home gardeners. Limited light sources can also cause your new seedlings to become tall and leggy, as they are reaching for the light. In a professional greenhouse, growers will often supplement the amount of light new seedlings get.

Full Spectrum Grow lights versus Regular Florescent

Starting your seeds under a bank of grow lights is the ideal way to go if you have the space, and depending on how many seeds you are starting. You should be able to go to your local hardware store and purchase a shop light unit. Usually you will have to buy the bulbs separately, but that is okay, as you can choose the lights you need. Typical light tubes for either the shop or kitchen are the florescent lights that are in the cool or blue range of the light spectrum. These are the best for starting seeds and growing seedlings. Lights in the red to orange range or full spectrum lights will promote flowering. Most cool lights are less expensive than the full spectrum lights bulbs.

Shop lights usually will come in 48 inch lengths and require 2 bulbs. Depending on how expensive you want to go, simple chains will come with most units, and will have a cord to plug into the wall electrical outlet. I like the chains because it allows you to lower and raise the light unit as your plants requirement for light changes. To help prevent stretching or having your seedlings become tall and skinny, have your light source as close to the canopy of the plants as you can. It is best to have the lights only 1 to 3 inches above the top leaves of the plants. This will help keep your plants healthy and stocky instead of weak and leggy.

Using 1 light unit, will allow you to have 2 flats of plants end to end, whereas having 2 shop lights next to each other, will allow you to have at least 4 flats of plants growing side by side under good quality light.

I grow under a double bank of shop lights, for a total of 4 x 48inch florescent light tubes. I use the T8 size bulbs for kitchen and bath.

Incandescent

Incandescent lights are the old single lights bulbs that you screw into light sockets, such as reading lamps or ceiling fans. These lights are not very beneficial for growing new plants because of their limited light patterns. When you get them close enough to the canopy of new seedlings, the lights become too hot, and will actually scorch or burn the leaves and you don't want that to happen. I don't recommend these types of bulbs.

Professional Lights

LED, Metal Halide, and High Pressure Sodium lights are much more expensive and are usually more than what the home gardener needs. I will leave it at that with these types of lights.

Chapter 6: Other Growing Needs



Growing Spaces

It is important to have the right amount of space for growing your new plants. What is the right amount of space? That will all depend on what you are growing. Maybe you can get away with a window sill that you have added extra lights in and that will accommodate a half dozen plants. Great! However, if you are planning on starting a hundred plants, and that is not too crazy depending on your garden needs, you will need some extra space.

I grow my plants on two shelves in a south-west facing sunroom that has lots of windows. However, shrubs and trees outside can limit the natural light that I can get, so I have added extra lights. I know many gardeners who take over their kitchen table in early spring growing their seedlings. If you have the space, and the right lights, you can grow plants anywhere.

Ideally you want your growing space to also be between 60 and 70 degrees Fahrenheit. This will help create ideal growing conditions for your seedlings. When starting your seeds, it should be on the warmer side. But once your seeds have germinated and you have transplanted them, you can keep the temperature down around 65 degrees. When growing areas are kept cooler, plants will grow slower and require less water. Be careful to not over water your plants. Remember that your lights will offer some, as in maybe a degree or two, but not a lot of temperature variance. And if you have your new seedlings near windows, be careful of drafts and freezing outside temps.

Heat Mats

Heat mats generally come in three sizes that will fit one to four flats. These will range from a 10 x 20 inch size up to a 20 x 48 inch mat. Placing your newly planted seed trays onto a heat mat will warm the soil and germination time will be shortened considerably. Pepper seeds can take up to 14 days to germinate. By using a heat mat, I can get my seeds to germinate in as few as 5 days. Heat mats reduce germination time and the chance for damping off or other problems that can arise when germinating seeds. If you don't want to purchase a heat mat, the space on top of a refrigerator usually can offer a warm setting.

You will only need the heat mats for germination of your seeds. If you keep your mats turned on, it can actually stunt or damaged your seedlings as they grow. Plus heating mats will cause your

soil to dry out faster. Always watch for dry spots in your soils. They can show up at any time and any place.

Identification tags

I have made the mistake of forgetting what I planted where in the garden. It is bad enough out in my garden when I forget to mark some of my rows, but I can tell the difference from corn and potatoes. However, when starting 5 different varieties of tomatoes and 10 varieties of peppers, there tends to be a problem. It is important to mark your seedling trays so you know what you are growing, and then when you have transplanted the new seedlings, mark each pack or cell. That way you will know what is where. It wasn't so fun, when biting into what I thought was a sweet pepper and instead, I got a bite of a hot pepper.

Identification tags can be as simple as popsicle sticks. You can buy them in a craft store, or you can buy the plastic markers in various sizes. Whichever you choose to use, make sure to write with a permanent marker or pen. Also keep track of your starting dates and other information in your gardening journal. That way you can always look back to see what you did.

Water

Water is the most important item when gardening and especially when starting your seeds. It takes water to moisten your seed starting mix. It takes water to help maintain humidity. It takes water to keep the plants alive once you have seedlings. And it takes water to help grow your garden. Water is the essence of life.

When starting your seeds, you will need to pre-moisten the soil mix to make sure that there is ample moisture to make sure your seeds will germinate. It is better to start with moist soil so as to not wash your seeds away. Once you have the seeds planted, place the clear plastic growing dome over the tray and place under the lights. If your soil is moist enough, you will notice humidity forming on the inside of the dome. If you notice that the soil is drying out, you are able to tell by the color of the potting soil will become light brown in color, carefully add water. I like to use a spray bottle, as to create a mist of spray, that will moisten the soil, but will not wash away or disturb the seeds.

Once your seeds have germinated, and have grown for a couple of days, be diligent in maintaining adequate soil moisture levels. If new seedlings happen to dry out from lack of moisture, it is unlikely that they will revive. When you are ready to transplant your new plants, you will want to make sure that they are moist and you are moving them into a larger cell that is filled with pre-moistened potting soil.

Once your plants have been transplanted into their larger cells, you can then start to water them directly, or better yet from the bottom up. Remember I mentioned old cookie sheets? If your surface is level, you should be able to add water to the bottom pan, and allow the plants to absorb the water from the bottom. Allow the plant to have adequate water, but to be able to almost dry out. Remember that newly transplanted plants haven't established a large root mass so they will not require as much water at first, but later on they will. Be diligent in monitoring the moisture levels in your soils.

Chapter 7: Ready to transplant



Which container works best and which one should you use? It all depends on what you are growing and how soon you will do your final transplant out into your garden. Once my tomato and pepper seeds have germinated, and have developed their true leaves, I will transplant them up into 1801 sized insert cells because I want a larger stronger plant to transplant into the garden and this size will hold a larger growing plant and will allow for a larger root base.

Transplanting a seedling is a fairly simple process, yet it might seem a bit intimidating for some. If you have sown your seeds in a seedling tray and your new seedlings have developed at least their first set of true leaves, you can carefully loosen the soil around the seedlings stem base, carefully separating it from the soil. The brand new roots are fragile and can be easily torn from the seedling. If this should happen, that seedling will die.

I like to transplant my tomatoes and pepper seedlings up to the individual 1801 cells. Have the new cells pre-filled with moistened potting soil, and taking your finger or pencil or marker, make a small hole in the middle of the cell. Usually an inch deep will be fine. Carefully place the bare seedling into the small hole and gently move the soil back around the stem of the seedling, making sure that all of the roots are covered.

If you started your seeds in the peat pellets, you can wait for a bit longer before needing to transplant those seedlings into a larger container or cell. When you are ready to do so, fill the larger container cell at least half way with moist potting soil. Place the growing plant, peat pellet and all, into the cell and add additional potting soil around the peat pellet, making sure not to compact the soil too tightly. You are now done with that plant. Continue on until all of your seedlings have been transplanted.

When I plant flowers, such as Marigolds or Zinnias, I will use the 1204 (48 plants) or a 1206 (72 plants) inserts filled with regular moist potting soil. As these seeds grow, they have enough room to grow and develop in one of the flats mentioned, and when the time is ready and danger of frost is past, I will transplant these flowers directly outside into my flowerbeds.

Remember it is always better to start with pre-moistened potting soil than trying to wet the soil once it is in the trays. To do this, I have a tub or storage tote that I dump my bags of potting soil into. I then take it to the sink and use the spray nozzle to add water to the potting soil. I will then stir the wet potting soil with my hands, (yes, I like to get my hands dirty), making sure that the

potting soil is evenly wet. Some bagged potting soils will already be moist, but a lot of times the soil has become dry. You want the soil, when you grab a handful and squeeze, to stay in a loosely formed ball and not to be dripping with excess water. Also when choosing your potting soil to transplant into, you don't need to continue using the seed starting mixes. You are now able to use a good potting soil. Again, I don't recommend the potting soils that have fertilizers or moisture control additives, especially for new transplants.

The size of the cell or pot can also limit the root development of each plant, which in turn can restrict the size of plant you grow. Make sure that you use the right sized container or insert for your plants. It is also important to moisten your potting soil prior to placing into the containers. You can wash away or displace seeds from the soil if you moisten or water the soil after the placement of the seeds.

Once you have transplanted your seedlings, you will need to be careful as you water them. Even though you started with moist soil in the new pots, (hopefully it wasn't dripping with water), you will want to carefully water the new transplants in. This will provide adequate moisture, but it will also help settle the loose potting soil around the roots of the new seedlings. It will be easy to overwater them at first. Remember that their roots won't suddenly double in size and won't be able to utilize all of the moisture. Watch for the coloring of the potting soil to lighten, this will be the best indicator of when the transplants need more water.

Fertilizing

Now that you have transplanted your seedlings up, and are just waiting for the weather to cooperate, your plants are going to need some fertilizer and more time for growing. There are so many fertilizer options out there that it is very easy to be overwhelmed with your choices of what to feed your new plants. I would recommend a water soluble type. This type of fertilizer is a powder, usually blue, that will dissolve in water. It is important to follow the directions on the label as they can vary by use. Normal plant applications might indicate 1 tablespoon per gallon of water, but for new seedling the directions might indicate a half rate solution. Always read the label.

I would also use a fertilizer that offers a balanced formulation of N-P-K such as a 20-20-20. The three numbers reference the amount of Nitrogen, Phosphorus, and Potassium that is available in the fertilizer. Nitrogen helps in cell development and growth, Phosphorus aids in root development and flower production, and Potassium helps build stronger cell walls, improving the over-all health of a plant. All fertilizer products are required to show their N-P-K ratio on the label. There might be additional nutrients available in the fertilizer product you are using and those can be usually found on the backside of the label.

When I water and fertilize my newly transplanted seedlings, I allow the water that I use to set for a time, until it has become warmed to room temperature. I do this by having a couple of extra plastic gallon jugs filled with water. New seedlings can become shocked when watered with water that is too cold.

Now that you have transplanted the seedlings, watered and fertilized them, you just have to watch them grow and wait for the weather to allow you to plant them outside. As the plants are growing, you will need to adjust your lights. This is why I have my lights on chains. I can easily adjust their heights as the plants continue to grow taller and taller. You are wanting to keep plants shorter and healthy; maintaining the lights a couple of inches, (no more than four inches), above the tops of the green leaves of the plants will ensure a healthier plant.

As you watch the calendar days go by, getting closer to that last average frost date, the weather has changed. Before you can plant your seedlings in your garden, you must first harden your plants off. You just don't want to plant them outside in the garden one day. Remember you are taking them from the comforts of your home and placing them outside to fend for themselves. It is heart breaking and discouraging to see all of your hard work die if they are placed out too early.

To harden off your new plants, at the appropriate time, start introducing them to the outside environment. Don't place them directly into a bright sunny area or in the windiest areas. If you have a porch or a partially shaded spot, send your plants there. Don't leave them out overnight at first, bring them in at night. After a few days of doing this, you are ready to plant them in your garden. Watch your nightly temperatures. If it threatens to get too cold, be ready to protect your newly planted transplants with some coverings.

Conclusion: Are you ready? Let's get growing!

One thing that you will need to determine is how many seeds and plants do you plan on starting. If this is your first attempt, I would suggest that you start off with one or two varieties. Don't feel that you have to start your whole garden from seed this year. It can be very discouraging, especially with gardening, when you don't experience success. Start off small and know the timing of the plants that you are starting. Not all garden seeds need to be started at the same time, and some garden seed can be planted directly outside, but you must know the timing first of each of the plants you are starting from seed. Please refer to my seed starting list. And I wish you success in your Seed Starting adventure.

A little about Me



There have only been a few years in my life that I remember not having a garden. As a child, I remember going out into the garden with my grandmother, she would patiently allow me to sow the corn seed and carefully watch as I cut the potatoes prior to planting. There are memories of watching the water run down between the rows as my father brought the water in from the ditch and canal. And then when the garden was done, I remember helping my mother with the canning of all of the garden produce. In each of those memories, I was being taught the importance of having a garden and how to tend and nurture it.

While in my college years, I even switched my major from architecture to landscaping. I realized that I wanted to be outside, playing with the dirt, rather than being inside in a stuffy office. And I haven't regretted that switch at all. After college, I spent almost twelve years working and managing a garden center. I then worked for a national fertilizer and chemical company traipsing over most of the western United States, training garden centers owners and their employees about those products.

Currently, I have one of those dream jobs you sometimes hear about, because I love what I do. I get to care for over five hundred roses in my local community where I am the Parks Director. Yes, I care for baseball fields and other public parks too, but to be able to play in the roses is the best.

As you can tell, I love to garden!

The End

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