

Chapter 1 : About Your Privacy on this Site

*The best, most comprehensive, book I have read about horticultural therapy*Debbie Birk, Horticultural Therapy Coordinator *Growing with Gardening offers step-by-step guidance in planning a year-round horticultural program for therapy, recreation, or education.*

Use barrels a wooden half-barrel can yield an amazing amount of food , buckets, baskets, boxes, bath- and other tubs, and troughsâ€”anything that holds soil. Many plants grown in pots must be watered as often as twice a day. To keep plants adequately cool and moist during hot summer days, double-pot: Place a small pot inside a larger one and fill the space between them with sphagnum moss or crumpled newspaper. Vegetables that can be easily transplanted are best suited for containers. Place containers where they will receive maximum sunlight and good ventilation. Watch for and control insect pests. Whatever the size or type, place your containers where they are most convenient to be cared for and will grow best. Plants in containers need the best possible soil, aeration, and drainage for healthy root growth and optimum harvest. Do not use soil from the garden: It is too heavy, can become waterlogged, and brings disease and insects with it. A teepee of bamboo stakes will hold pole beans or snap peas. Cucumbers trained to climb up a nylon mesh fence will develop fruit that hang down and grow straight. To maximize space and thus your harvest, plant root crops, low-growers, and tall climbers together in the same container. The climbers will eagerly scramble up a trellis, while the small plants spread around their base. Mix quick-maturing plants, such as lettuce or radishes , with longer-growing ones, like tomatoes or broccoli. Group plants with similar needs for sun and water, such as pole beans, radishes, and lettuce; cucumber, bush beans, and beets ; tomatoes, basil , and onions ; and peas and carrots. For supplies, you only need a good container, the right soil mix , and appropriate seed or transplant varieties. In addition to providing 5 hours or more of full sun, watering is critical.

Chapter 2 : Gardening and Growing with The Garden Helper - Garden Helper, Gardening Questions and A

Create the perfect front yard and backyard landscapes with our gardening tips. We'll tell you about beautiful annual, perennial, bulb, and rose flowers, as well as trees, shrubs, and groundcovers that put on a year-round gardening show.

View as slideshow Photo by Kolin Smith To grow well, vegetables need good soil, the right amount of water, and sunshine. You can amend poor soil and deal with too much or too little moisture by building raised beds bottomless frames that hold soil above the grade line to keep vegetables above muck, or by irrigating in dry weather. But there is no practical work-around for deep shade. Thus, sunshine is the Number 1 site requirement to grow a vegetable garden. Fruiting plants like tomatoes, eggplants, peppers, and pumpkins need sun at least 8 to 10 hours a day. If your garden gets a few hours less sun, you can still grow peas and also plants that have edible parts underground, such as potatoes, turnips, carrots, and beets. If your garden gets only 4 to 6 hours of sun, focus on greens: Homeowner Michele Rast collects brussel sprouts and other goodies to fill a basket for friends. Beds 2 to 4 feet wide generally work best. Make main paths at least 3 feet wide so that you can get a wheelbarrow through. In a small garden it often works best to divide a bed into square-foot sections. Devote each one to the number of plants that can use the space efficiently. So you might put in nine bush beans, since they need about 4 inches between plants, or 16 onions, spaced 3 inches apart. Lettuce grows fast but turns bitter as it sends up a flower stalk. To be sure you always have young leaves to harvest, plant a few new seeds every few weeks. You can skim off the sod with a flat shovel and dig down deeply to aerate the soil and mix in compost and whatever other soil amendments you need. Or you can just layer things on top. Start by mowing down any tall grass or weeds. Shovel on a couple of inches of compost. Cover that with a weed-suppressing layer of cardboard or multiple sheets of newspaper. Top that with a mixture of brown and green plant material, just as if you were building a compost pile. If you want to plant right away, add a few inches of compost or topsoil, and the beds are ready to go. Or wait a season and let microorganisms in the soil make the compost for you. After you harvest your first crops, you can "double dig," going down twice as deep as a shovel blade, to incorporate everything and aerate the soil. A homeowner drills weepholes into a raised planting bed. Create Optimal Conditions With Compost View as slideshow Every vegetable garden benefits from a few inches of compost each year. But what about adding lime, other trace minerals, or fertilizer? To learn what you need to grow a vegetable garden, get a soil test. Finished compost looks like rich organic soilâ€”dark and crumbly in texture, with no large chunks of material. To check if yours is ready, grab a handful, put it in a pot, and place a few grass seeds in it.

Chapter 3 : Growing with plants

The Fruit Trees Book - Growing Apples: A Beginner Gardening Books Series on Yard Upkeep, Soil Testing, Planting, Pruning & Tree Care (Your No-Nonsense Guide To A Juicy Apple Harvest In Your Backyard).

How to Get Seeds or Clones – Choosing the Right Strain The two most popular ways to get cannabis seeds or clones is in person or via online seed banks. Seeds vs Clones or read on below <https://www.growweeb.com/seed-bank>: Just like with animals, the way your cannabis plants turn out will have a lot to do with the genetics they started life with. Each cannabis plant is a mixture of the traits from its two parents. Tutorial About Choosing the Right Strain <https://www.growweeb.com/seed-bank>: There are three main strains or types of cannabis: These types are not set in stone. Nearly all cannabis strains you run into will be some sort of hybrid. Some strains lean more indica, others lean more Sativa. Some are a class of their own. Sativa Sativa strains tend to cause more of a cerebral or mental high. Sativas grow larger, have higher light requirements, and take longer to mature than indica plants so a sativa strain of cannabis may need special plant training to be suited for growing indoors. Sativas often have thin, finger-like leaves while indicas have fatter, rounder leaves. Hybrid It is often simplest to grow marijuana plants that are a hybrid strain because they have been bred to carry the best traits of both sativa and indica. When growing with Ruderalis-based cannabis strains such as the Lowryder, you can give the plant up to 18 hours of light a day for the whole grow, and your plant will be ready to harvest in about 3 months. Because of their short lifecycle, Ruderalis cannabis strains generally do not grow taller than feet. Learn more about choosing the right cannabis strain: Viable cannabis seeds are usually hard and dark colored. Seeds which are kept in a cool, dry place away from light will remain viable for five years or even longer! The downside of using seeds that you find in the bud you got from your local weed dealer is that about half of the seeds will end up being male, and only half will end being female. Some growers get very lucky with bagseed, and end up with great results. Already have your seeds? Get started with germinating your cannabis seeds. Whenever possible, get a trusted strain for best results! It is actually safe and reliable to buy your marijuana seeds online from a reputable seed source. The biggest problem for USA residents ordering online is the long wait time – nearly all cannabis seed sources are located overseas. Yet as long as you choose to get guaranteed delivery from your seed source, you know that they will always eventually come, even if it takes twice as long as expected. Learn more about buying cannabis seeds online with safety Getting seeds online will allow you to purchase feminized all-female seeds and will also let you pick the exact strain to match your size and time requirements. This can be helpful when setting up your grow space. Clones Clones are an exact copy of another plant. When starting with a clone, you can expect the plant to grow and produce buds in a very similar way to the mother plant it came from. This can be helpful to growers because they know exactly what to expect. In order to get cannabis clones, you will need to know someone who already has cannabis plants. The only online way to get cannabis plants is by ordering seeds. You may be able to buy cannabis clones from your local medical marijuana dispensary if you have a recommendation for marijuana from your doctor in a medical state. One of the great things about starting with seeds is anyone can do it.. Starting with a cannabis clone can save you a couple of weeks to a month compared to starting with seeds because they have a head start on growth. Using clones instead of regular seeds guarantees the gender of your weed plant because the clones have the exact same genetics as their parent plant including gender. If you already have female plants, you can clone them to make more plants copies without ever having to worry about sexing your plants or creating seeds. New cannabis clones like warm, wet conditions. Before your clones have made roots, they to get water through their leaves right until roots have formed. A humid cloner works great for getting clones to root, or you can mist your plants a few times a day until they start forming roots. Some growers will use a heating pad under their clones to help keep things warm. Many automatic cloners come with a heat setting. If your clone has already established its roots, then you can put it in its new home with your grow lights a bit further away than normal. Only give your clone just a little bit of water at first with either no nutrients or a highly diluted nutrient solution. However, in the very beginning, less is more for your clone. Your recently-moved clone is more sensitive to heat and light than an established plant, and putting it in a completely new environment can be stressful. Once the clone has started

really growing usually after a couple of days then you can put your lights closer and start feeding it with full-strength nutrients. At this point you basically treat the clone like a cannabis plant in the vegetative stage first stage of life. Get started with creating and caring for your cannabis clones: I ended up yielding 6. But for some of the bigger grow lights, the electric bill can grow quite a bit, especially when using AC units. Each person has different electricity rates depending on where they live, but let me give you an idea with another one of my grow setups. And I live in a hot area with expensive electricity. For me, growing indoors saves handfuls of money compared to buying buds, even with the cost of electricity. For some growers, this is more than enough. This will help you choose the right growing setup. A setup like this can yield several ounces or even a pound of bud at harvest.

Chapter 4 : Welcome to calendrierdelascience.com! - KidsGardening

'Hypertufa Containers - Creating and Planting an Alpine Trough Garden is a new book by Lori Chips that addresses a very specific gardening method which while old-fashioned, may have found its time given climate change and a gardening audience which is growing more and more aware.

Today many of us struggle with corn. A few of us still celebrate sweet corn and dried corn however, especially as a garden crop. Even small -yard gardeners with limited space can grow some varieties - especially new ones specially bred for containers although I do feel that these are best considered as a novelty crop and not something worthy of feeding a family with. The fact is a full raised bed 4 x 8 feet or a 10 x foot plot can provide a decent crop if you have the room. Dried corn, on the other hand, is often more complex and interesting if one does find a rare, old variety. Just do your homework My tiny plot of corn still gives us corn in the tiny gap season when our local farms seem to run out. Mainly the names of the varieties. This very well may be my personal gripe but when I see "Butter and sugar" spray painted on a sign I go crazy. Lumping all sweet corn into two buckets bushels? I snapped this yesterday as I was driving home near my house. I assume everthing here comes from the Boston vegetable market but it is rather typical of what one sees everywhere. Corn is affected more by cultural trends than most any other vegetable. My father considered himself a corn aficionado I mean - you have no idea, he was literally crazy about sweet corn. My dad came from an entirely different era€”born in I am certain that corn on the cob was often a complete meal for him and his 7 brothers in this house. I know this because we were one of those families that often had a few dozen ears of sweetcorn on the table for meals in the summer not to save money, but because it was good. Like most corn geeks I like a balance between corn flavor, starch, and some sugar, but mostly I like the popping texture that comes with some of the newest hybrids when you eat them straight off of the cob. There is nothing like it. The breakthrough of SE or Sugar Extender sugar enhanced corn was a big breakthrough in the late 20th century, and while those varieties are far better than old sweet corn varieties, they were bred for long-life on the supermarket shelf, and many of us just think that they are too sweet when compared against new Augmented Shrunken SH2 genetics or even Synergistic varieties. I shall explain in far more detail than any human needs in this post. I am hardly a normal consumer of corn I am also hardly an expert, but rather a fan. We would hop with him into our Country Squire station wagon and drive to certain local farms somewhere he used to work as a kid as their fields became ready to pick. He somehow knew what varieties Mr. Salo was planting that year, and he knew the maturity dates. He also would demand that we be allowed out into the field to pick the corn so that it would be of optimum freshness. We were one of those households where sweet corn was considered a complete meal. Dozens would be cooked and that would be supper on any given weeknight in the summer. We would only be allowed to cut corn off of the cobs if it was too old, or if we needed to take it somewhere like on a picnic or to school for lunch. Dad was born in , a time when corn hybridizing was changing things. Corn seems to come in styles and follows fashion. Bi-colored corn eventually became more popular than all-yellow corn in the midth century but it was never my fathers favorite. I on the other hand while young wanted white corn, simply because it seemed rare and odd. My point is - these are still old late 20th century varieties and we might want to move on from them. The problem was I could never get my dad to buy it. Then came Bi-colored corn. It wasnt until bi-color corn started to be marketed under the variety namesthat was more appealing did he try it. Names then began to be more user firendly and appealing. Blue corn varieties are generally heirloom types and are best for ornamental use. Still, how pretty is this Indigo variety? Wouldnt you want corn that had everything? The perfect balance of starch, sugar, and pop? Then knowing the variety name is key. Farm stands and market growers knwo that sweet corn is a cash crop. Even more so today. The race starts in early spring when growers try to get their corn planted earlier than their competitors. This year I noticed Remy floating fabric over an entire field near the farm where I grow veggies. The owner told me that they now plant corn as plugs very early in the spring - weeks before anyone else. Then they cover the fields with floating row covers to protect the seedlings from frost. This gives them a jump on all of the local competition. I just pop the young plants into prepared ground with little effort even as early as mid

april. May 5th is the typical sowing date for sweet corn here in Zone 5 New England. Varieties do matter for both commercial farmers and home growers as date-to-maturity while important, isn't as critical as variety. Does it germinate in cold soil? Will the pollen affect a neighboring plot of corn? Will the stalks grow too tall and shade something else? Will all the corn come in at the same time? Some varieties grow better in early spring, others better in high summer. Some are best for the fall. Flavor though is often the most important reason why a home grower would want to think long about the variety they are growing. Commercial farmers tend only to choose their crop varieties based on the market. Ten years ago you never knew the difference between a Brandywine tomato and a Big Girl. My point is that more and more of us today are informed - we know the difference. We are familiar with the names of some varieties, especially with fruit. We can tell the difference between hype and authenticity. Odd when there are literally hundreds and hundreds of varieties. Home raised popcorn is a fun crop. Just be sure that the ears are pollinated well by hand with tassels from another plant. This crop was raised in a double row that was hand pollinated last summer. Dry it well though if you plan to pop it. Of course, new variety name probably need some tweaking or creativity, and few are any good or helpful. So renaming corn might be in order first. Pollinate your corn at home by snapping off a tassel that is dripping with pollen on a dry afternoon, and shake it over the silks which are emergin on the little ears. It;s fun to do, and doesnt hurt the plant. Imagine every silk as a thread that leads to a kernel. The next time you are buying corn, ask the seller what variety it is. I do this all the time and only once in Vermont did I get an honest answer. At least on the east coast. Old varieties of dry corn are often superior to newer ones. Here is one case where heirloom really delivers. Green Oaxcan corn makes some of the best cornmeal. Homemade cornmeal is easy to make. I made this last year in my Vitamix blender. Corn genetics concern people, but probably more than they should: First, there are no GMO corn varieties that a home grower could grow or even access. The truth is, corn breeding is science, and if you believe in science and all of the good that it can bring to our world, then you should be able to appreciate why new corn varieties are often better performers in the garden than most heirloom varieties. We should also consider that in one sense corn is already genetically modifiedâ€”through selection over the millennia. If you have any concerns about GMO corn, then do try growing your own dry corn. Beleive me - nothing tastes like home-grown cornmeal. A sq foot bed supplied us with 5 quarts of cornmeal. You should feel safe buying seed anywhere as no GMO seed is available for home growers at all- so relax. That said, some GMO sweet corn on-the-ear is showing up in supermarkets, but I imagine that most of this corn is raised in the south for northern markets during the winter. Breed me a blight-free tomato with the flavor of summer, please. I want that now. Wouldnt that solve everything? There are many varieties of dry, heirloom or ornamental corn available today. Each are so rewarding to grow in the homer garden. Corn is a very old crop. One of the oldest man has ever cultivated. We know where corn originated, and it looked nothing like the crop we recognize today.

Chapter 5 : Garden Guides | For All Things Gardening

Hydroponic growing is a sustainable gardening method that brings proper nutrients, light and oxygen to your plants so they grow steadily in optimal conditions.

Hanging baskets in Thornbury, South Gloucestershire Residential gardening takes place near the home, in a space referred to as the garden. Although a garden typically is located on the land near a residence, it may also be located on a roof , in an atrium , on a balcony , in a windowbox , or on a patio or vivarium. Gardening also takes place in non-residential green areas, such as parks, public or semi-public gardens botanical gardens or zoological gardens , amusement parks , along transportation corridors, and around tourist attractions and garden hotels. In these situations, a staff of gardeners or groundskeepers maintains the gardens. Indoor gardening is concerned with the growing of houseplants within a residence or building, in a conservatory , or in a greenhouse. Indoor gardens are sometimes incorporated as part of air conditioning or heating systems. Indoor gardening extends the growing season in the fall and spring and can be used for winter gardening. Native plant gardening is concerned with the use of native plants with or without the intent of creating wildlife habitat. The goal is to create a garden in harmony with, and adapted to a given area. This type of gardening typically reduces water usage, maintenance, and fertilization costs, while increasing native faunal interest. Water gardening is concerned with growing plants adapted to pools and ponds. Bog gardens are also considered a type of water garden. These all require special conditions and considerations. A simple water garden may consist solely of a tub containing the water and plant s. In aquascaping , a garden is created within an aquarium tank. Container gardening is concerned with growing plants in any type of container either indoors or outdoors. Common containers are pots, hanging baskets , and planters. Container gardening is usually used in atriums and on balconies, patios, and roof tops. Community gardening is a social activity in which an area of land is gardened by a group of people, providing access to fresh produce and plants as well as access to satisfying labor, neighborhood improvement, sense of community and connection to the environment. These shared gardens, typically front or back yards , are usually used to produce food that is divided between the two parties. Organic gardening uses natural, sustainable methods, fertilizers and pesticides to grow non- genetically modified crops. Garden features and accessories[edit] There is a wide range of features and accessories available in the market for both the professional gardener and the amateur to exercise their creativity. These are used to add decoration or functionality, and may be made from a wide range of materials such as copper, stone, wood, bamboo, stainless steel , clay , stained glass , concrete, or iron. Examples include trellis , arbors , statues, benches , water fountains , urns , bird baths and feeders, and garden lighting such as candle lanterns and oil lamps. Comparison with farming[edit] Hand gardening tools Gardening for beauty is likely[original research? Small-scale, subsistence agriculture called hoe-farming is largely indistinguishable from gardening. A patch of potatoes grown by a Peruvian peasant or an Irish smallholder for personal use could be described as either a garden or a farm. Gardening for average people evolved as a separate discipline, more concerned with aesthetics, recreation and leisure , [17] under the influence of the pleasure gardens of the wealthy. In respect to its food-producing purpose, gardening is distinguished[by whom? Farming occurs on a larger scale, and with the production of salable goods as a major motivation. There is some overlap between the terms, particularly in that some moderate-sized vegetable growing concerns, often called market gardening , can fit in either category. Planting in a garden The key distinction between gardening and farming is essentially one of scale; gardening can be a hobby or an income supplement, but farming is generally understood[by whom? One distinction is that gardening is labor-intensive and employs very little infrastructural capital , sometimes no more than a few tools, e. By contrast, larger-scale farming often involves irrigation systems , chemical fertilizers and harvesters or at least ladders , e. However, this distinction is becoming blurred with the increasing use of power tools in even small gardens. In part because of labor intensity and aesthetic motivations, gardening is very often much more productive per unit of land than farming. Monty Don has speculated on an atavistic connection between present-day gardeners and pre-modern peasantry. Gardening is effectively scaled up to feed entire villages of

over people from specialized plots. A variant is the community garden which offers plots to urban dwellers; see further in allotment gardening. Gardens as art[edit] Garden at the Schultenhof in Mettingen , North Rhine-Westphalia , Germany Garden design is considered to be an art in most cultures, distinguished from gardening, which generally means garden maintenance. Garden design can include different themes such as perennial, butterfly, wildlife, Japanese, water, tropical , or shade gardens. In Japan, Samurai and Zen monks were often required to build decorative gardens or practice related skills like flower arrangement known as ikebana. In 18th-century Europe, country estates were refashioned by landscape gardeners into formal gardens or landscaped park lands, such as at Versailles , France, or Stowe , England. Today, landscape architects and garden designers continue to produce artistically creative designs for private garden spaces. City of Toronto" , , the right to cultivate all native species, even most varieties deemed noxious or allergenic, was upheld as part of the right of free expression. Community gardening comprises a wide variety of approaches to sharing land and gardens. People often surround their house and garden with a hedge. Common hedge plants are privet , hawthorn , beech , yew , leyland cypress , hemlock , arborvitae , barberry , box , holly , oleander , forsythia and lavender. The idea of open gardens without hedges may be distasteful to those who enjoy privacy. The Slow Food movement has sought in some countries to add an edible school yard and garden classrooms to schools, e. Garden pests[edit] Garden pests are generally plants , fungi , or animals frequently insects that engage in activity that the gardener considers undesirable. A pest may crowd out desirable plants, disturb soil, stunt the growth of young seedlings, steal or damage fruit, or otherwise kill plants, hamper their growth, damage their appearance, or reduce the quality of the edible or ornamental portions of the plant. Aphids , spider mites , slugs , snails , ants , birds , and even cats are commonly considered to be garden pests. Because gardeners may have different goals, organisms considered "garden pests" vary from gardener to gardener. *Tropaeolum speciosum* , for example, may be considered a desirable and ornamental garden plant, or it may be considered a pest if it seeds and starts to grow where it is not wanted. As another example, in lawns , moss can become dominant and be impossible to eradicate. In some lawns, lichens , especially very damp lawn lichens such as *Peltigera lactucifolia* and *P.* Garden pest control[edit] There are many ways by which unwanted pests are removed from a garden. For example, snails may be dealt with through the use of a chemical pesticide, an organic pesticide, hand-picking, barriers, or simply growing snail-resistant plants. Pest control is often done through the use of pesticides , which may be either organic or artificially synthesized. Pesticides may affect the ecology of a garden due to their effects on the populations of both target and non-target species. For example, unintended exposure to some neonicotinoid pesticides has been proposed as a factor in the recent decline in honey bee populations. These guns are especially effective inside of barns and sheds, as the snake shot will not shoot holes in the roof or walls, or more importantly injure livestock with a ricochet. They are also used for pest control at airports , warehouses , stockyards , etc.

Chapter 6 : Learn How to Grow Cannabis Indoors | Grow Weed Easy

Gardening Projects. Projects help you learn about gardening. You can even work on gardening projects during the winter. Try different projects, such as growing plants inside your home or growing a garden with a theme.

Hydroponics is a form of agriculture where plant roots grow, not in soil, but in nutrient-enriched water. With the addition of automatic controls, it can be nearly maintenance-free. Hydroponic Historical Roots Hydroponic gardening has roots in ancient history, possibly as far back as the first century in ancient Rome, when Emperor Tiberius wanted cucumbers grown year-round at his palace. Further south, in the 10th and 11th centuries, the Aztecs developed a system of hydroponic floating gardens or chinampas. Once known as nutriculture and chemiculture, the term hydroponics derives its meaning from the Greek words for water hydro and working ponos “working water. The term became a part of the horticultural lexicon when Dr. Gericke of the University of California, Berkeley conducted experiments on plant nutrition for large-scale commercial farming applications. Outside the lab, Gericke became unpopular with his neighbors when he grew foot-high tomato vines in his backyard using only mineral nutrient solutions. How it Works Plants grown hydroponically do not depend on soil to obtain nutrients. Some Benefits of Growing Hydroponically Controlled System for Optimal Growing Conditions Hydroponics utilize closed-circuit controlled systems which enable gardeners to maintain optimal growing conditions. As plants require adequate air circulation to receive the carbon dioxide needed for photosynthesis, indoor hydroponic systems usually include fans or some sort of venting system. Herbicide-Free Crops No soil means no weeds, so plants grown hydroponically do not require any harmful herbicides. As soil often contains diseases which can be transmitted to plants, hydroponic plants tend to be more disease- and pest-resistant, although not completely. As in soil-based growing, hydroponic plants can attract pests. But pests tend to be minimal due to the controlled growing environment. Hydroponic plants are not necessarily organic, but growers can control pests using biological methods in lieu of harmful pesticides. Great For Small-Space Living and Indoor Gardening Hydroponic systems are perfect for gardeners living in small spaces, as they require very little square footage. In the same amount of space, growing hydroponically produces four times the amount of crops of traditional soil-based techniques. Most home systems are easy to set up, and relocating the garden is no arduous task, as the systems are generally simple to move. Can Be Almost Maintenance-Free Some hydroponic systems are nearly plug-and-play, as they feature automatic controls which monitor water and nutrient levels, and a timer to manage irrigation and add nutrient solution when needed. Six Basic Hydroponic Systems There are four basic methods of hydroponic or soilless gardening “active, passive, recovery, and non-recovery” and six basic hydroponic systems which each function differently, but in all cases the plants receive their nutrients via some form of water hydro delivery system: A timer controls a submersed pump which drips nutrient solution onto the base of each plant via a small drip line. Wick System Maybe the simplest hydroponic system, the wick system involves no moving parts and can use a variety of growing media. In all cases the nutrient solution gets released onto the growing tray and delivered to the roots through a wick. Water Culture and Aquaponic Systems In this system, the containers holding the plants sit inside a floating Styrofoam platform, through which the roots are suspended directly into the nutrient water. Aquaponic systems are a form of water culture that uses fish. The fish produce waste, which becomes nutrients to fertilize the plants. The plants then filter and purify the water, which gets recycled back to the fish in a continuous cycle. Fish can survive for weeks without feeding, and they only need what they can eat in about 5 minutes “a very small amount of fish food. The fish, often tilapia, can also end up on your dinner table. Nutrient Film System The nutrient film system, aka NFT, involves a continuous flow of nutrients, eliminating the need for a timer. A pump forces the nutrient solution over the plant roots onto a grow tray, then the overflow drains into a reservoir. Aeroponics In an aeroponic system, sometimes referred to as fogponics, the roots are not suspended in water but hang in the air, where they receive a nutrient-rich growing medium via misting with a nutrient-rich solution. The concept of hydroponics is not rocket science. Oh, wait, maybe it is. Growing food in the cosmos may represent the future as NASA experiments with cultivating crops hydroponically in space. Astronauts will be growing their

kale in a space capsule, while back on Earth, individuals with postage stamp-sized indoor spaces may do the same on a small countertop using controlled hydroponic systems. Ready to dip your toe, or your plants, into the water? Embed the article on your site.

Chapter 7 : Garden Lesson Plans for Hands-on Learning - KidsGardening

The Garden Helper is a free gardening encyclopedia and guides to growing and caring for gardens, plants and flowers.

Water culture became a popular research technique after that. In 1835, John Woodward published his water culture experiments with spearmint. He found that plants in less-pure water sources grew better than plants in distilled water. By 1840, a list of nine elements believed to be essential for plant growth had been compiled, and the discoveries of German botanists Julius von Sachs and Wilhelm Knop, in the years 1840-1842, resulted in a development of the technique of soilless cultivation. It quickly became a standard research and teaching technique and is still widely used. Solution culture is, now considered, a type of hydroponics where there is no inert medium. In 1929, William Frederick Gericke of the University of California at Berkeley began publicly promoting that solution culture be used for agricultural crop production. Gericke created a sensation by growing tomato vines twenty-five feet high. Satchell, a phycologist with an extensive education in the classics. In 1935, Gericke published the book, *Complete Guide to Soilless Gardening*, after leaving his academic position in a climate that was politically unfavorable. Hoagland and Daniel I. Arnon wrote a classic agricultural bulletin, *The Water Culture Method for Growing Plants Without Soil*, [9] which made the claim that hydroponic crop yields were no better than crop yields with good-quality soils. Crop yields were ultimately limited by factors other than mineral nutrients, especially light. This research, however, overlooked the fact that hydroponics has other advantages including the fact that the roots of the plant have constant access to oxygen and that the plants have access to as much or as little water as they need. In soil, a grower needs to be very experienced to know exactly how much water to feed the plant. Too much and the plant will be unable to access oxygen; too little and the plant will lose the ability to transport nutrients, which are typically moved into the roots while in solution. These two researchers developed several formulas for mineral nutrient solutions, known as Hoagland solution. Modified Hoagland solutions are still in use. One of the earliest successes of hydroponics occurred on Wake Island, a rocky atoll in the Pacific Ocean used as a refueling stop for Pan American Airlines. Hydroponics was used there in the 1940s to grow vegetables for the passengers. Hydroponics was a necessity on Wake Island because there was no soil, and it was prohibitively expensive to airlift in fresh vegetables. Hydroponics research mimicking a Martian environment uses LED lighting to grow in a different color spectrum with much less heat. Eurofresh declared bankruptcy, and the greenhouses were acquired by NatureSweet Ltd. For all techniques, most hydroponic reservoirs are now built of plastic, but other materials have been used including concrete, glass, metal, vegetable solids, and wood. The containers should exclude light to prevent algae and fungal growth in the nutrient solution. In static solution culture, plants are grown in containers of nutrient solution, such as glass Mason jars typically, in-home applications, plastic buckets, tubs, or tanks. The solution is usually gently aerated but may be un-aerated. If un-aerated, the solution level is kept low enough that enough roots are above the solution so they get adequate oxygen. A hole is cut in the lid of the reservoir for each plant. A single reservoir can be dedicated to a single plant, or to various plants. Reservoir size can be increased as plant size increases. A home made system can be constructed from plastic food containers or glass canning jars with aeration provided by an aquarium pump, aquarium airline tubing and aquarium valves. Clear containers are covered with aluminium foil, butcher paper, black plastic, or other material to exclude light, thus helping to eliminate the formation of algae. The nutrient solution is changed either on a schedule, such as once per week, or when the concentration drops below a certain level as determined with an electrical conductivity meter. Whenever the solution is depleted below a certain level, either water or fresh nutrient solution is added. In raft solution culture, plants are placed in a sheet of buoyant plastic that is floated on the surface of the nutrient solution. That way, the solution level never drops below the roots. Continuous-flow solution culture [edit] The nutrient film technique being used to grow various salad greens In continuous-flow solution culture, the nutrient solution constantly flows past the roots. It is much easier to automate than the static solution culture because sampling and adjustments to the temperature and nutrient concentrations can be made in a large storage tank that has potential to serve thousands of plants. A popular variation is the nutrient film technique or NFT, whereby a very shallow stream

of water containing all the dissolved nutrients required for plant growth is recirculated past the bare roots of plants in a watertight thick root mat, which develops in the bottom of the channel and has an upper surface that, although moist, is in the air. Subsequent to this, an abundant supply of oxygen is provided to the roots of the plants. A properly designed NFT system is based on using the right channel slope, the right flow rate, and the right channel length. The main advantage of the NFT system over other forms of hydroponics is that the plant roots are exposed to adequate supplies of water, oxygen, and nutrients. In all other forms of production, there is a conflict between the supply of these requirements, since excessive or deficient amounts of one results in an imbalance of one or both of the others. NFT, because of its design, provides a system where all three requirements for healthy plant growth can be met at the same time, provided that the simple concept of NFT is always remembered and practised. The result of these advantages is that higher yields of high-quality produce are obtained over an extended period of cropping. A downside of NFT is that it has very little buffering against interruptions in the flow e. But, overall, it is probably one of the more productive techniques.

While slopes along channels of 1: As a consequence, it is recommended that slopes of 1: The slope may be provided by the floor, benches or racks may hold the channels and provide the required slope. Both methods are used and depend on local requirements, often determined by the site and crop requirements. As a general guide, flow rates for each gully should be one liter per minute. Flow rates beyond these extremes are often associated with nutritional problems. Depressed growth rates of many crops have been observed when channels exceed 12 meters in length. On rapidly growing crops, tests have indicated that, while oxygen levels remain adequate, nitrogen may be depleted over the length of the gully. As a consequence, channel length should not exceed 10–15 meters. In situations where this is not possible, the reductions in growth can be eliminated by placing another nutrient feed halfway along the gully and halving the flow rates through each outlet.

Aeroponics Aeroponics is a system wherein roots are continuously or discontinuously kept in an environment saturated with fine drops a mist or aerosol of nutrient solution. The method requires no substrate and entails growing plants with their roots suspended in a deep air or growth chamber with the roots periodically wetted with a fine mist of atomized nutrients. Excellent aeration is the main advantage of aeroponics. A diagram of the aeroponic technique Aeroponic techniques have proven to be commercially successful for propagation, seed germination, seed potato production, tomato production, leaf crops, and micro-greens. Another distinct advantage of aeroponics over hydroponics is that any species of plants can be grown in a true aeroponic system because the microenvironment of an aeroponic can be finely controlled. The limitation of hydroponics is that certain species of plants can only survive for so long in water before they become waterlogged. Aeroponics is also widely used in laboratory studies of plant physiology and plant pathology. Aeroponic techniques have been given special attention from NASA since a mist is easier to handle than a liquid in a zero-gravity environment.

Fogponics Fogponics is a derivation of aeroponics wherein the nutrient solution is aerosolized by a diaphragm vibrating at ultrasonic frequencies. The smaller size of the droplets allows them to diffuse through the air more easily, and deliver nutrients to the roots without limiting their access to oxygen.

Passive hydroponics Passive sub-irrigation, also known as passive hydroponics, semi-hydroponics, or hydroculture, [23] is a method wherein plants are grown in an inert porous medium that transports water and fertilizer to the roots by capillary action from a separate reservoir as necessary, reducing labor and providing a constant supply of water to the roots. In the simplest method, the pot sits in a shallow solution of fertilizer and water or on a capillary mat saturated with nutrient solution. The various hydroponic media available, such as expanded clay and coconut husk, contain more air space than more traditional potting mixes, delivering increased oxygen to the roots, which is important in epiphytic plants such as orchids and bromeliads, whose roots are exposed to the air in nature. Additional advantages of passive hydroponics are the reduction of root rot and the additional ambient humidity provided through evaporations. Hydroculture compared to traditional farming in terms of crops yield per area in a controlled environment was roughly 10 times more efficient than traditional farming, uses 13 times less water in one crop cycle than traditional farming, but on average uses times more kilojoules per kilogram of energy than traditional farming.

Ebb and flow In its simplest form, there is a tray above a reservoir of nutrient solution. Either the tray is filled with growing medium clay granules being the most common and then plant directly or place the pot over medium,

stand in the tray. At regular intervals, a simple timer causes a pump to fill the upper tray with nutrient solution, after which the solution drains back down into the reservoir. This keeps the medium regularly flushed with nutrients and air. Once the upper tray fills past the drain stop, it begins recirculating the water until the timer turns the pump off, and the water in the upper tray drains back into the reservoirs. The method was invented in Bengal in ; for this reason it is sometimes referred to as "The Bengal System". In its simplest form, a nutrient-and-water solution is manually applied one or more times per day to a container of inert growing media, such as rockwool, perlite, vermiculite, coco fibre, or sand. In a slightly more complex system, it is automated with a delivery pump, a timer and irrigation tubing to deliver nutrient solution with a delivery frequency that is governed by the key parameters of plant size, plant growing stage, climate, substrate, and substrate conductivity, pH, and water content. In a commercial setting, watering frequency is multi-factorial and governed by computers or PLCs. Commercial hydroponics production of large plants like tomatoes, cucumber, and peppers uses one form or another of run-to-waste hydroponics. In environmentally responsible uses, the nutrient-rich waste is collected and processed through an on-site filtration system to be used many times, making the system very productive. Deep water culture[edit] Main article: Deep water culture The hydroponic method of plant production by means of suspending the plant roots in a solution of nutrient-rich, oxygenated water. Traditional methods favor the use of plastic buckets and large containers with the plant contained in a net pot suspended from the centre of the lid and the roots suspended in the nutrient solution. The solution is oxygen saturated by an air pump combined with porous stones. With this method, the plants grow much faster because of the high amount of oxygen that the roots receive. While deep water culture involves the plant roots hanging down into a reservoir of nutrient solution, in top-fed deep water culture the solution is pumped from the reservoir up to the roots top feeding. As with deep water culture, there is an airstone in the reservoir that pumps air into the water via a hose from outside the reservoir. The airstone helps add oxygen to the water. Both the airstone and the water pump run 24 hours a day. The biggest advantage of top-fed deep water culture over standard deep water culture is increased growth during the first few weeks. With top-fed deep water culture, the roots get easy access to water from the beginning and will grow to the reservoir below much more quickly than with a deep water culture system. Once the roots have reached the reservoir below, there is not a huge advantage with top-fed deep water culture over standard deep water culture. However, due to the quicker growth in the beginning, grow time can be reduced by a few weeks. This section relies too much on references to primary sources. Please improve this section by adding secondary or tertiary sources.

Chapter 8 : Gardening - Wikipedia

Hydroponic gardening is one of the best ways to grow fresh vegetables year round. It is also a great alternative for growing a variety of plants in smaller spaces, such as indoors. Hydroponic gardening is simply a means of growing plants without soil. When plants are grown hydroponically, their.

Keep your bird feeders cleaned and filled, especially when there is snow on the ground! Today there are over 32 million Christmas trees sold each year in this country. There are over a million acres planted with Christmas trees, employing about , people annually. For every real Christmas tree harvested, 2 to 3 seedlings are planted in its place. The average six foot Christmas tree will take six years to grow, but certain species may take as long as fifteen years to reach that height. Whether you are going to use a living tree or a cut tree, there are a few important things you should know about selecting and caring for your Christmas tree. The first consideration should be freshness, after all, you want to be sure that your tree will survive through the entire holiday season. Drafts, extremes in temperature, and sudden changes in temperatures should be carefully avoided. Norfolk Pines need bright light but never full sun. Preferably you should place your tree within four feet of a large window. Norfolks can survive with only household incandescent or fluorescent lighting if they receive a minimum of 16 hours of light each day, but there is no substitute for bright, natural light. Turn your Norfolk Island Pine frequently to keep it symmetrical. Calendar of Gardening Tasks and Projects For a complete guide of the important tasks, maintenance and projects that should be done in your garden each month, check out the Gardening Calendars. Gardening tasks are the same, no matter where you live. In other zones, they are just done in a different month! If you do your gardening is in cooler or warmer regions, browse the months before and after the current month for reminders of anything you forgot to do, and projects that you have to look forward to. This should allow you to plan your seasonal gardening activities well in advance, and help keep your plants and flowers looking their very best. Winter Blooming House Plants Christmas and Thanksgiving Cactus, Jade Plants and Poinsettias are short day plants that bloom in reaction to the natural shortening of the days in fall. Holiday Cactus Schlumbergera Hybrids Holiday Cactus are capable of blooming at almost any time of the year by manipulating their light and temperature. The natural changes of daylight hours will usually trigger blooming of these different Holiday Cactus to coincide with their named holiday. Protect from artificial light during night time hours. Increase watering and resume feeding when the flower buds appear. Christmas Cactus and other Holiday Cactus do not like to be moved to a different location once they set their buds. Rapid environmental changes can cause the flower buds to quickly drop. This can be accomplished by placing your plant in a closet or unlit room, or by covering the plant with black cloth, black plastic frame or a cardboard box. At this stage, ANY light, even turning on a light bulb in the room for a few seconds will delay the bloom for up to a day! Your Poinsettia plant should be returned to the light each day and given a minimum of 4 hours of direct sun. Jade Plant Crassula argentea Typically, all healthy, mature Jade Plants will bloom, usually around Christmas in the northern hemisphere. Their blooming is triggered by the natural shortening of the daylight hours. If your Jade Tree is in a room that usually has lights turned on at night, it will more than likely fail to bloom for you. Find a suitable area that seldom has the lights on at night but receives good, natural light during the day. Amaryllis Hippeastrum Plant Amaryllis bulbs 8 weeks before you would like them to bloom. Bulbs can be planted at two week intervals, from September through February to ensure non-stop winter bloom, until May. Plant in a well-drained, sterile potting medium, using a standard 6-inch diameter pot. Be sure that the pot has adequate drainage holes. Click on them to enlarge. I hope that you enjoyed your visit to The Garden Helper! Please come back again, soon Other articles you might like:

Chapter 9 : Container Gardening with Vegetables | Getting Started | The Old Farmer's Almanac

Hydroponics is proved to have several advantages over soil gardening. The growth rate on a hydroponic plant is percent faster than a soil plant, grown under the same conditions. The yield of the plant is also greater.