

GARDENING TOPICS



YARD TOOLS - WEED EATERS - RIDING MOWERS - PUSH MOWERS - ZERO TURN MOWERS
LEAF BLOWERS - MULCH - SHOVELS - GARDEN RAKES - LEAF RAKES - GARDEN HOE

GARDENING BOOKS - GARDEN TOOL KITS

I hope you enjoy this book...

Table of Contents

Benefits Of Gardening For Kids
Choosing the Best Plants for your Garden
In Search of the Best Gardening Tools
Butterfly Gardening
Choosing a Garden that is Perfect for You
Choosing and Planting Perennials
Container Gardening Tips for Newbies
Creating a Raised Bed
Creating Microclimates to Facilitate Growth
Dealing with Garden Pests
Landscape Gardening
Making A Garden
Planting Seeds
Requisites Of The Home Vegetable Garden
The Cultivation Of Vegetables
The Genesis Of Soil
Vegetable Culture
Wild-Flower Garden
Conclusion

Benefits Of Gardening For Kids

Apparently, we can see how nature is treated these days. It is a sad thing to know that people do not pay attention so much anymore to the environmental problems. What can we do about this? It's as simple as starting with the children. It is good to see the children's involvement with environment-friendly activities. One such nature-loving activity that children could easily get their hands on is gardening. Why should you consider gardening for your children?

Here are the benefits that gardening could easily provide the children with:

1. Science

In planting, children are indirectly taught the wonders of science like the plant's life cycle and how human's intervention can break or make the environment. They can have a first hand experience on the miracle of life through a seed. This would definitely be a new and enjoyable experience for the kids.

2. Life

Watching a seed grow into a tree is just as wondrous as the conception to birth and growth of a child. In time, kids will learn to love their plants and appreciate the life in them. Gardening could actually help simulate how life should be treated -- it should be with care. The necessities to live will be emphasized to kids with the help of gardening - water, sunlight, air, soil. Those necessities could easily be corresponded to human necessities, i.e., water, shelter, air, food. By simply weeding out, one could educate how bad influences should be avoided to be able to live life smoothly.

3. Relaxation

Studies show that gardening can reduce stress because of its calming effect. This is applicable to any age group. More so, it stimulates all the five senses. Believe it or not, gardening may be used as therapy to children who have been abused or those who are members of broken homes. It helps build one's self-esteem.

4. Quality Time with the Family

You can forget about your stressful work life for a while be soothed by the lovely ambience in the garden. You can play and spend quality time with your children. You can talk while watering the plants or you can work quietly beside each other. The bottom line is, always do what you have to do, together with your kids. You might discover a lot of new things about your child while mingling with them in your garden.

Let kids become aware of their environment's needs. And one way to jumpstart that environmental education may be through gardening. It's hitting two birds with one stone -- teach them to respect life while you bond with them.

Choosing the Best Plants for your Garden

Many times we buy plants on impulse then find there is nowhere in the garden that really suits them. Before buying plants carefully examine your garden to see how much sun and shade it gets, whether the soil is well drained or waterlogged and whether your aspect is sheltered or windswept. You'll then be equipped to go and buy the best plants for your situation; shade-loving plants for the sheltered areas, sun-lovers for the warm spots, drought-resistant plants for the parched areas which may be either sunny or shaded, and swamp plants for the poorly-drained parts.

But wait! Test your soil first, to determine the pH level of your soil and what kind of nutrients you need to add, if any. Is the soil acid or alkaline? Most plants prefer soil that is slightly acidic, but there are some that must have alkaline soil to grow. You can alter the soil's pH level, but it's much easier to simply plant for the soil you have.

Now you are ready to plant. Well - almost. Will you plant in groups or singly? If you buy 'one of everything' your garden may seem rather spotty. Group plantings are organized, harmonious and you can vary the color for interest.

Before planting out, place your chosen plants around the garden bed in their pots to see how they will look. Re-arrange them until you are satisfied. Grouping plants in sets of threes or fives usually looks better than planting in groups of even numbers. Be sure that you have an interesting combination of colors and textures of plants. Tall plants should go to the back, or the center if your garden will be viewed equally from all sides. Try to keep your plants away from trees. The roots of trees are fiercely competitive and will steal all the nutrients and moisture meant for your flowers.

The right color scheme is one way to maintain the harmony in your garden. Imagine the color of the flowers when they are in bloom. Some colors may clash with others, but can still be planted side-by-side if they have a different blooming season. Foliage color is also important. Many flower plants have silver, grey or purplish foliage that is just as attractive as the flower. This means that they are still attractive well past the blooming season and so have added value.

In Search of the Best Gardening Tools

Different kinds of gardens require different kinds of garden tools. Hardware stores mostly cater for a wide range of tools, but there are shops that specialize in the more expensive kind of garden tool that shouts quality. Wherever you decide to shop, here are a few pointers to advise you.

Do you have small garden or a large one? A small garden will not require the same large equipment that would be of use in an extensive one. A ride-on mower is unnecessary if you only have a small strip of lawn. Another point to consider is who does most of the gardening? Some tools are too heavy for use by women.

When you buy secateurs make sure the blade always stays sharp to avoid damaging the plant. Look for models that have blades that can be sharpened or replaced, models with tension control and with sizes that best fit your hands. Secateurs usually cost around \$50 - \$130.

Hedge trimmers or shears are handy - but only if you have a hedge, or plan on growing one. Some hedge trimmers have curved blades to stop branches from sliding out when cut.

Forks are used for turning and aerating compost and breaking up lumps of soil. The cheaper ones are often not strong enough for heavy soil, so go for sturdiness instead of price. Forks usually cost around \$30 - \$100.

A shovel has a scoop blade and is best used to move around dirt and garden soil. A spade has a flat blade great for cutting edges, digging and dividing plants. The edge of a spade should be kept sharpened for clean and efficient cutting will cause the least amount of damage to plants. These are a basic garden necessity and usually cost from \$30 - \$50.

A pruning saw is used for pruning trees and larger shrubs, while secateurs are for plants like roses. Pruning saws have a narrow curved blade that fits between stems or branches and easily and cuts them as you pull the saw backwards. They are approximately \$27- \$55.

A chipping hoe is a handy tool for getting rid of small weeds. The Dutch or push-hoe is slightly more user-friendly as the action required to use it does not jar the neck and shoulder quite so much.

A rake is also a basic requirement for the garden. The strong rake with the flat head and sharp metal prongs is used for smoothing a garden bed and getting out the last of the bumps and weeds. The plastic rake is used to gather leaves and grass clippings only.

Gardening tools don't have to be expensive. Flea markets and garage sales can be excellent places to pick up great tool bargain.

Butterfly Gardening

What is butterfly gardening? Simply put butterfly gardening is the art of growing flowers and plants that will attract these colorful and dainty creatures to your garden. Delight your family and visitors with beautiful butterflies, but be sure to create a safe habitat for them. If you own cats rethink your plans, because it would be a shame to attract these lovely insects to their death.

The design your butterfly garden is a matter of personal preference. Typical points to consider are the size of your garden and the types of flowers and plants you want to grow. Pick a style of garden that appeals to you, but ensure it also contains the plants and flowers that appeal to the butterflies you wish to attract.

It is important to find out which plants and flowers will attract the species of butterflies that live in your area. This information can be found at the local library

To create the kind of environment that they find attractive, you will also need water of some kind. A birdbath will look attractive and keep the butterflies up off the ground, away from stray cats or mischievous puppies. A shallow dish on a post or hung in a tree will do just as well.

When planting your butterfly garden be careful how you coordinate the colors you choose for your flowerbeds. Although butterflies do not care about your choice of color, you don't want your garden to be a hodgepodge of unrelated colors and textures. Butterflies are attracted to those flowers that have nectar rather than pollen, like honeysuckle, milkweed, summer lilac, Valerian, daisies, Purple Cone flower, Yellow Sage, day lilies and lavender.

Some people find it helpful to draw and color a layout of their butterfly gardening plan to see what the finished product would look like. Keep in mind that warm colors like red and orange are flashy and showy. These colors have a greater impact against a strong green background. Cool colors such as blue and purple are soothing and toned down and would work better with a white contrast to create the look of freshness and brightness.

Choosing a Garden that is Perfect for You

If you're thinking about starting a garden, the first thing you need to consider is what type of garden you will have. There are many different choices and often it can be hard to pick just one, but hopefully you can narrow it down. But by narrowing it down, you'll make the gardening experience easier on yourself and the plants. If all your plants are similar, then it shouldn't be very hard to care for them all. So here are some of the main garden ideas for you to choose from.

If you're just looking for something to look nice in your yard, you'll want a flower garden. These are usually filled with perennial flower. Perennial flowers are flowers which stay healthy year-round. They're basically weeds because of their hardiness, only nice looking. Different areas and climates have different flowers which are considered perennials. If you do a quick internet search for your area, you can probably find a list of flowers that will bring your flower garden to life. These usually only require work in the planting stage - after that, the flower take care of themselves. The only downside to this is that you don't have any product to show for it.

Another choice for your garden is to have a vegetable garden. These usually require a little more work and research than a flower garden, but can be much more rewarding. No matter what time of the year it is, you can usually find one vegetable that is still prospering. That way you can have your garden be giving you produce almost every day of the year! When starting a vegetable garden, you should build it with the thought in mind that you will be adding more types of veggies in later. This will help your expandability. Once all your current crops are out of season, you won't be stuck with almost nowhere to put the new crops. A vegetable garden is ideal for someone who wants some produce, but doesn't want to devote every waking hour to perfecting their garden (see below.)

One of the more difficult types of gardens to manage is a fruit garden. It's definitely the most high-maintenance. When growing fruits, many more pests will be attracted due to the sweetness. You not only have to deal with having just the right dirt and fertilizer, you have to deal with choosing a pesticide that won't kill whoever eats the fruits. Your fruit garden will probably not produce year-round. The soil needs to be just right for the plants to grow, and putting in another crop during its off-season could be disastrous to its growth process. If you're willing to put lots of work into maintaining a garden, then a fruit garden could be a good choice for you.

So now that I've outlined some of the main garden types that people choose, I hope you can make a good decision. Basically, the garden type comes down to what kind of product you want, and how much work you want to put into it. If you're looking for no product with no work, go with a flower garden. If you want lots of delicious product, but you are willing to spend hours in your garden each day, then go for a fruit garden. Just make sure you don't get into something you can't handle!

Choosing and Planting Perennials

If you've been growing a vegetable garden for a while, you might be feeling slightly disgruntled at how plain it is to look at. I too began my gardening career with a vegetable garden, but I decided that it wasn't quite as pleasing to look at as I would have liked. I heard from a friend that the use of perennial flowers could be a great way to liven up my garden without adding any extra work for me.

Perennial flowers are strong, local flowers that come back every year without having to replant or do any extra work. During their off seasons, the flowers and stems die back and you can hardly even tell the plant is there (rather than just dying and looking like hideous brown clumps in your garden). When it's time to bloom, entirely new flowers shoot up where the old ones were.

Before deciding whether to put in perennials or not, you need to make sure that your soil has proper drainage. If the water stays saturated for long periods of time, you should build a raised bed. To test, dig a hole and fill it with water. Wait a day, and then fill it with water again. All traces of water should be gone within 10 hours. If the hole isn't completely dry, you will need to build a raised bed.

Picking your perennials can be a complicated process. The goal should be to have them flowering as much as possible during the year, so you should create an outline of the year. Research the different types of flower you want, and create a timeline of flowering. If you plan it right, you can have a different type of flower blooming at any point in the year. Getting just the right mixture of seeds can give your yard a constantly changing array of colors.

When you go to buy the seeds from your local florist or nursery, you might be able to find a custom seed mixture for your area. This takes the really tough research part out of the job. Usually these blends are optimized for the local climate, and do great jobs of having flowers always grow in your yard. If one of these isn't available, you can ask the employees what they think would be a good mixture. They should be happy to help you put something together which will be optimal for whatever you desire.

You should definitely use mulch when planting perennials. This will reduce the overall amount of work you have to do, by reducing the amount of weeds and increasing the water retention. Bark or pine needles work great, I have found, and depending on the rest of your yard you might have them on hand at no charge. As for fertilizer, you should use it sparingly once your plants start to come to life.

When you actually go to plant the seeds, you should put them in small, separate clumps according to the directions. This is because they tend to spread out, and if you have too many too close together then they will end up doing nothing but choking each other out. As you plant them, throw in a little bit of extremely weak fertilizer. In no time at all you should start to see flowers blooming up.

Container Gardening Tips for Newbies

Container gardens can create a natural sanctuary in a busy city street, along rooftops or on balconies. You can easily accentuate the welcoming look of a deck or patio with colorful pots of annuals, or fill your window boxes with beautiful shrub roses or any number of small perennials. Whether you arrange your pots in a group for a massed effect or highlight a smaller space with a single specimen, you'll be delighted with this simple way to create a garden.

Container gardening enables you to easily vary your color scheme, and as each plant finishes flowering, it can be replaced with another. Whether you choose to harmonize or contrast your colors, make sure there is variety in the height of each plant. Think also of the shape and texture of the leaves. Tall strap-like leaves will give a good vertical background to low-growing, wide-leaved plants. Choose plants with a long flowering season, or have others of a different type ready to replace them as they finish blooming.

Experiment with creative containers. You might have an old porcelain bowl or copper urn you can use, or perhaps you'd rather make something really modern with timber or tiles. If you decide to buy your containers ready-made, terracotta pots look wonderful, but tend to absorb water. You don't want your plants to dry out, so paint the interior of these pots with a special sealer available from hardware stores.

Cheaper plastic pots can also be painted on the outside with water-based paints for good effect. When purchasing pots, don't forget to buy matching saucers to catch the drips. This will save cement floors getting stained, or timber floors rotting.

Always use a good quality potting mix in your containers. This will ensure the best performance possible from your plants.

If you have steps leading up to your front door, an attractive pot plant on each one will delight your visitors. Indoors, pots of plants or flowers help to create a cosy and welcoming atmosphere. Decide ahead of time where you want your pots to be positioned, then buy plants that suit the situation. There is no point buying sun lovers for a shady position, for they will not do well. Some plants also have really large roots, so they are best kept for the open garden.

If you have plenty of space at your front door, a group of potted plants off to one side will be more visually appealing than two similar plants placed each side. Unless they are spectacular, they will look rather boring.

Group the pots in odd numbers rather than even, and vary the height and type. To tie the group together, add large rocks that are similar in appearance and just slightly different in size. Three or five pots of the same type and color, but in different sizes also looks affective.

With a creative mind and some determination, you will soon have a container garden that will be the envy of friends and strangers alike.

Creating a Raised Bed

If your current planting goals involve plants that require good water drainage, I am sure you know how frustrating it is to have a yard that just won't cooperate. Some plants can handle the excess water that comes about from being in an area that doesn't drain properly. In fact, it might just cause them to bloom more lushly. However, other plants don't cope as well, and it will cause them to die a gruesome, bloated death. You should always find out about the drainage required for every plant you buy, and make sure that it won't conflict with any of the areas you are considering planting it in.

In order to test how much water your designated patch of soil will retain, dig a hole approximately ten inches deep. Fill it with water, and come back in a day when all the water had disappeared. Fill it back up again. If the 2nd hole full of water isn't gone in 10 hours, your soil has a low saturation point. This means that when water soaks into it, it will stick around for a long time before dissipating. This is unacceptable for almost any plant, and you are going to have to do something to remedy it if you want your plants to survive.

The usual method for improving drainage in your garden is to create a raised bed. This involves creating a border for a small bed, and adding enough soil and compost to it to raise it above the rest of the yard by at least 5 inches. You'll be amazed at how much your water drainage will be improved by this small modification. If you're planning to build a raised bed, your prospective area is either on grass or on dirt. For each of these situations, you should build it slightly differently.

If you want to start a raised garden in a non grassy area, you won't have much trouble. Just find some sort of border to retain the dirt you will be adding. I've found that there is nothing that works quite as well as a few two by fours. After you've created the wall, you must put in the proper amount soil and steer manure. Depending on how long you plan to wait before planting, you will want to adjust the ratio to allow for any deteriorating that may occur.

If you're trying to install a raised bed where sod already exists, you will have a slightly more difficult time. You will need to cut the sod around the perimeter of the garden, and flip it over. This may sound simple, but you will need something with a very sharp edge to slice the edges of the sod and get under it. Once you have turned it all upside down, it is best to add a layer of straw to discourage the grass from growing back up. After the layer of straw, simply add all the soil and steer manure that a normal garden would need.

Planting your plants in your new area shouldn't pose much difficulty. It is essentially the same process as your usual planting session. Just be sure that the roots don't extent too far into the original ground level. The whole point of creating the raised bed is to keep the roots out of the soil which saturates easily. Having long roots that extend that far completely destroys the point.

Once you have plants in your new bed, you'll notice an almost immediate improvement. The added soil facilitates better root development. At the same time, evaporation is prevented and decomposition is discouraged. All of these things added together makes for an ideal environment for almost any plant to grow in. So don't be intimidated by the thought of adjusting the very topography of your yard. It is a simple process as I'm sure you've realized, and the long term results are worth every bit of work.

Creating Microclimates to Facilitate Growth

Many gardeners live in areas where almost anything can grow effortlessly. Just plant the seeds and water it for a few weeks, and you've got a beautifully lush plant. But if you live in somewhere like Colorado, you'll understand what its like to have a slim selection of plants that naturally grow. It can be quite a challenge to facilitate the growth of a large variety of plants, especially when the very world you live in seems to be rooting against you.

Some people solve this problem by loading up their plants with every type of chemical and fertilizer known to man. This usually works, but to me it seems kind of unnatural to rely on man made materials to keep your plants alive. Also, if I'm growing fruits or vegetables, I don't feel very comfortable eating something that is entirely composed of chemicals.

A gardening theory that I have relied on in the past to grow many types of plants is that of creating a "microclimate" for each type of plant. This is when you regulate the sunlight, shade, moisture, and wind factors for each separate plant. It sounds like a challenge, and it is. But you can regulate these factors in such a way that the plant feels just like it is in the ideal growing conditions. This can be achieved by the use of wind barriers, shading umbrellas, extra water, or different types or amounts of compost.

If you're ready to make an attempt at creating microclimates, you'll need to make a detailed plan in advanced. You should start by finding a large shade providing bush or tree that will grow fast and naturally in your area. Just look at some undeveloped plots of land and see what is there. Most likely it grew on its own without any planting or care. This is what you want to happen. Usually the growing of one plant can bring about the growing of another more desirable plant.

If you have a fence in your backyard (you would be surprised at how many people don't) then you already have a good amount of shade to work with. You can start the microclimate process using just the shade of the fence, combined with (perhaps) a screen or large bush to shade your new plant for the other half of the day that the fence doesn't take care of. The fence is also useful for shading against wind for very fragile plants.

Once you have established the shade, be it natural or unnatural, you have created a slightly less harsh miniature environment. You must remember this is a gradual process, and find a new plant to put in the shade of the other one. Now your choices are a little more open. You don't have to go with a rugged plant like the one you did before; you can now choose a plant that survives in cooler weather.

If the plant you are trying to grow next requires more moisture in the air than your area provides, installing a fountain or small pond can fix this problem due to the evaporation. You may think you don't want to waste water on a pond or fountain, but it's all going toward the betterment of your garden. It's just like the watering process, only indirect. As an added benefit, usually fountains are quite aesthetically attractive and a great addition to your garden.

I can't explain every stage of the process, because everyone's goals and setups are slightly different. But to reach your goal, you should do research on every plant that you would like to have in your garden. Find out everything you can about the zone that it flourishes in, and ask yourself how you can emulate that zone within your own backyard. Almost always you can take control of the environment and

recreate whatever you wish. Usually all it takes is some planning and strategy.

Dealing with Garden Pests

While tending to my own garden, I have found that one of the most frustrating things that can happen to a gardener is to walk outside to check on your plants. It's just a routine walk to make sure that your garden is thriving, but you end up finding holes in all of your plants that looked fine only hours before. The explanations for some of these plant-destroying holes are garden pests. Some of the main garden pests are slugs, worms, caterpillars, birds, snails, and the occasional gopher. Although you can never wipe out these pests entirely, after all your hard work in the garden you have to do something.

Insects are one of the worst things to have in your garden; they can live under the soil, in old weeds or piles of leaves, or in a number of other places. In order to help keep insects away, always try and eliminate places in your garden and near your garden that these insects and other plant diseases could be living. Remove old leaves, weeds, or any other decaying matter that insects and diseases could be living in from your yard. Also, regularly turn over your garden soil and break apart any clumps of dirt so that you can eliminate the living spaces any insects that might be hiding underground.

Another way to rid your garden of the pests is to use dormant spray, which is used to keep destructive insects and diseases under control. It is best that you use dormant spray when your plants are dormant, usually around February or early March. I have used dormant spray many times on my garden and it has worked wonders on keeping insects out. But as I learned from experience, dormant spray is only effective if you follow the correct instructions. When I first decided to use some on my garden, I just dumped it everywhere in hopes of killing everything harmful. Unfortunately I ended up killing my entire garden along with my neighbors. Some insects can be beneficial to your garden though, so be sure to find out which insects help your garden.

Another pest problem I've had besides insects has been birds. Whenever I see birds in my garden I run outside a chase them away, but as soon as I step inside they come right back. The solution that I've come up with to keep the birds away from my garden is to put a bird feeder in my yard. Instead of costing me time and money by eating my garden, the birds eat at the bird feeder. In the long run it'll save you money. Not only can a bird feeder help keep birds away from your garden, but they can also be a new part of your yard decoration. Although not completely eliminating my bird problem, my bird feeder has made the problem smaller. Getting a dog has also helped.

If you start seeing mounds of dirt around your yard, and your plants keep unexplainably dying, you can assume that you have a gopher problem. Thankfully, this is one of the few garden pests that I haven't had. However my friend has struggled with a tremendous gopher infestation, so I decided to research it. Gophers are rodents that are five to fourteen inches long. Their fur can be black, light brown, or white, and they have small tails. One method of getting rid of these root-eating pests is to set traps. The key to successfully capturing a gopher using a trap is to successfully locate the gopher's tunnels and set the trap correctly. Another way to get rid of them is to use smoke bombs, which you place into the tunnel and the smoke spreads through out it and hopefully reaches the gopher.

If you suspect that your gardens are being pillaged by any of the pests I mentioned, I encourage you to try your hardest to eliminate the problem as soon as possible. The longer you let the species stay, the more established it will become.

Landscape Gardening

Landscape gardening has often been likened to the painting of a picture. Your art-work teacher has doubtless told you that a good picture should have a point of chief interest, and the rest of the points simply go to make more beautiful the central idea, or to form a fine setting for it. So in landscape gardening there must be in the gardener's mind a picture of what he desires the whole to be when he completes his work.

From this study we shall be able to work out a little theory of landscape gardening.

Let us go to the lawn. A good extent of open lawn space is always beautiful. It is restful. It adds a feeling of space to even small grounds. So we might generalize and say that it is well to keep open lawn spaces. If one covers his lawn space with many trees, with little flower beds here and there, the general effect is choppy and fussy. It is a bit like an over-dressed person. One's grounds lose all individuality thus treated. A single tree or a small group is not a bad arrangement on the lawn. Do not center the tree or trees. Let them drop a bit into the background. Make a pleasing side feature of them. In choosing trees one must keep in mind a number of things. You should not choose an overpowering tree; the tree should be one of good shape, with something interesting about its bark, leaves, flowers or fruit. While the poplar is a rapid grower, it sheds its leaves early and so is left standing, bare and ugly, before the fall is old. Mind you, there are places where a row or double row of Lombardy poplars is very effective. But I think you'll agree with me that one lone poplar is not. The catalpa is quite lovely by itself. Its leaves are broad, its flowers attractive, the seed pods which cling to the tree until away into the winter, add a bit of picture squeness. The bright berries of the ash, the brilliant foliage of the sugar maple, the blossoms of the tulip tree, the bark of the white birch, and the leaves of the copper beech all these are beauty points to consider.

Place makes a difference in the selection of a tree. Suppose the lower portion of the grounds is a bit low and moist, then the spot is ideal for a willow. Don't group trees together which look awkward. A long-looking poplar does not go with a nice rather rounded little tulip tree. A juniper, so neat and prim, would look silly beside a spreading chestnut. One must keep proportion and suitability in mind.

I'd never advise the planting of a group of evergreens close to a house, and in the front yard. The effect is very gloomy indeed. Houses thus surrounded are overcapped by such trees and are not only gloomy to live in, but truly unhealthful. The chief requisite inside a house is sunlight and plenty of it.

As trees are chosen because of certain good points, so shrubs should be. In a clump I should wish some which bloomed early, some which bloomed late, some for the beauty of their fall foliage, some for the color of their bark and others for the fruit. Some spireas and the forsythia bloom early. The red bark of the dogwood makes a bit of color all winter, and the red berries of the barberry cling to the shrub well into the winter.

Certain shrubs are good to use for hedge purposes. A hedge is rather prettier usually than a fence. The Californian privet is excellent for this purpose. Osage orange, Japan barberry, buckthorn, Japan quince, and Van Houtte's spirea are other shrubs which make good hedges.

I forgot to say that in tree and shrub selection it is usually better to choose those of the locality one lives in. Unusual and foreign plants do less well, and often harmonize but poorly with their new setting.

Landscape gardening may follow along very formal lines or along informal lines. The first would have straight paths, straight rows in stiff beds, everything, as the name tells, perfectly formal. The other method is, of course, the exact opposite. There are danger points in each.

The formal arrangement is likely to look too stiff; the informal, too fussy, too wiggly. As far as paths go, keep this in mind, that a path should always lead somewhere. That is its business to direct one to a definite place. Now, straight, even paths are not unpleasing if the effect is to be that of a formal garden. The danger in the curved path is an abrupt curve, a whirling effect. It is far better for you to stick to straight paths unless you can make a really beautiful curve. No one can tell you how to do this.

Garden paths may be of gravel, of dirt, or of grass. One sees grass paths in some very lovely gardens. I doubt, however, if they would serve as well in your small gardens. Your garden areas are so limited that they should be re-spaded each season, and the grass paths are a great bother in this work. Of course, a gravel path makes a fine appearance, but again you may not have gravel at your command. It is possible for any of you to dig out the path for two feet. Then put in six inches of stone or clinker. Over this, pack in the dirt, rounding it slightly toward the center of the path. There should never be depressions through the central part of paths, since these form convenient places for water to stand. The under layer of stone makes a natural drainage system.

A building often needs the help of vines or flowers or both to tie it to the grounds in such a way as to form a harmonious whole. Vines lend themselves well to this work. It is better to plant a perennial vine, and so let it form a permanent part of your landscape scheme. The Virginia creeper, wistaria, honeysuckle, a climbing rose, the clematis and trumpet vine are all most satisfactory.

close your eyes and picture a house of natural color, that mellow gray of the weathered shingles. Now add to this old house a purple wistaria. Can you see the beauty of it? I shall not forget soon a rather ugly corner of my childhood home, where the dining room and kitchen met. Just there climbing over, and falling over a trellis was a trumpet vine. It made beautiful an awkward angle, an ugly bit of carpenter work.

Of course, the morning-glory is an annual vine, as is the moon-vine and wild cucumber. Now, these have their special function. For often, it is necessary to cover an ugly thing for just a time, until the better things and better times come. The annual is 'the chap' for this work.

Along an old fence a hop vine is a thing of beauty. One might try to rival the woods' landscape work. For often one sees festooned from one rotted tree to another the ampelopsis vine.

Flowers may well go along the side of the building, or bordering a walk. In general, though, keep the front lawn space open and unbroken by beds. What lovelier in early spring than a bed of daffodils close to the house? Hyacinths and tulips, too, form a blaze of glory. These are little or no bother, and start the spring aright. One may make of some bulbs an exception to the rule of unbroken front lawn. Snowdrops and crocuses planted through the lawn are beautiful. They do not disturb the general effect, but just blend with the whole. One expert bulb gardener says to take a basketful of bulbs in the fall, walk about your grounds, and just drop bulbs out here and there. Wherever the bulbs drop, plant them. Such small bulbs as those we plant in lawns should be in groups of four to six. Daffodils may be thus planted, too. You all remember the grape hyacinths that grow all through Katharine's side yard.

The place for a flower garden is generally at the side or rear of the house. The backyard garden is a lovely idea, is it not? Who wishes to leave a beautiful looking front yard, turn the corner of a house,

and find a dump heap? Not I. The flower garden may be laid out formally in neat little beds, or it may be more of a careless, hit-or-miss sort. Both have their good points. Great masses of bloom are attractive.

You should have in mind some notion of the blending of color. Nature appears not to consider this at all, and still gets wondrous effects. This is because of the tremendous amount of her perfect background of green, and the limitlessness of her space, while we are confined at the best to relatively small areas. So we should endeavour not to blind people's eyes with clashes of colors which do not at close range blend well. In order to break up extremes of colors you can always use masses of white flowers, or something like mignonette, which is in effect green.

Finally, let us sum up our landscape lesson. The grounds are a setting for the house or buildings. Open, free lawn spaces, a tree or a proper group well placed, flowers which do not clutter up the front yard, groups of shrubbery these are points to be remembered. The paths should lead somewhere, and be either straight or well curved. If one starts with a formal garden, one should not mix the informal with it before the work is done.

Making A Garden

The first thing in garden making is the selection of a spot. Without a choice, it means simply doing the best one can with conditions. With space limited it resolves itself into no garden, or a box garden. Surely a box garden is better than nothing at all.

But we will now suppose that it is possible to really choose just the right site for the garden. What shall be chosen? The greatest determining factor is the sun. No one would have a north corner, unless it were absolutely forced upon him; because, while north corners do for ferns, certain wild flowers, and begonias, they are of little use as spots for a general garden.

If possible, choose the ideal spot a southern exposure. Here the sun lies warm all day long. When the garden is thus located the rows of vegetables and flowers should run north and south. Thus placed, the plants receive the sun's rays all the morning on the eastern side, and all the afternoon on the western side. One ought not to have any lopsided plants with such an arrangement.

Suppose the garden faces southeast. In this case the western sun is out of the problem. In order to get the best distribution of sunlight run the rows northwest and southeast.

The idea is to get the most sunlight as evenly distributed as possible for the longest period of time. From the lopsided growth of window plants it is easy enough to see the effect on plants of poorly distributed light. So if you use a little diagram remembering that you wish the sun to shine part of the day on one side of the plants and part on the other, you can juggle out any situation. The southern exposure gives the ideal case because the sun gives half time nearly to each side. A northern exposure may mean an almost entire cut-off from sunlight; while northeastern and southwestern places always get uneven distribution of sun's rays, no matter how carefully this is planned.

The garden, if possible, should be planned out on paper. The plan is a great help when the real planting time comes. It saves time and unnecessary buying of seed.

New garden spots are likely to be found in two conditions: they are covered either with turf or with rubbish. In large garden areas the ground is plowed and the sod turned under; but in small gardens remove the sod. How to take off the sod in the best manner is the next question. Stake and line off the garden spot. The line gives an accurate and straight course to follow. Cut the edges with the spade all along the line. If the area is a small one, say four feet by eighteen or twenty, this is an easy matter. Such a narrow strip may be marked off like a checkerboard, the sod cut through with the spade, and easily removed. This could be done in two long strips cut lengthwise of the strip. When the turf is cut through, roll it right up like a roll of carpet.

But suppose the garden plot is large. Then divide this up into strips a foot wide and take off the sod as before. What shall be done with the sod? Do not throw it away for it is full of richness, although not quite in available form. So pack the sod grass side down one square on another. Leave it to rot and to weather. When rotted it makes a fine fertilizer. Such a pile of rotting vegetable matter is called a compost pile. All through the summer add any old green vegetable matter to this. In the fall put the autumn leaves on. A fine lot of goodness is being fixed for another season.

Even when the garden is large enough to plow, I would pick out the largest pieces of sod rather than have them turned under. Go over the plowed space, pick out the pieces of sod, shake them well and

pack them up in a compost heap.

Mere spading of the ground is not sufficient. The soil is still left in lumps. Always as one spades one should break up the big lumps. But even so the ground is in no shape for planting. Ground must be very fine indeed to plant in, because seeds can get very close indeed to fine particles of soil. But the large lumps leave large spaces which no tiny root hair can penetrate. A seed is left stranded in a perfect waste when planted in chunks of soil. A baby surrounded with great pieces of beefsteak would starve. A seed among large lumps of soil is in a similar situation. The spade never can do this work of pulverizing soil. But the rake can. That's the value of the rake. It is a great lump breaker, but will not do for large lumps. If the soil still has large lumps in it take the hoe.

Many people handle the hoe awkwardly. The chief work of this implement is to rid the soil of weeds and stir up the top surface. It is used in summer to form that mulch of dust so valuable in retaining moisture in the soil. I often see people as if they were going to chop into atoms everything around. Hoeing should never be such vigorous exercise as that. Spading is vigorous, hard work, but not hoeing and raking.

After lumps are broken use the rake to make the bed fine and smooth. Now the great piece of work is done.

Planting Seeds

Any reliable seed house can be depended upon for good seeds; but even so, there is a great risk in seeds. A seed may to all appearances be all right and yet not have within it vitality enough, or power, to produce a hardy plant.

If you save seed from your own plants you are able to choose carefully. Suppose you are saving seed of aster plants. What blossoms shall you decide upon? Now it is not the blossom only which you must consider, but the entire plant. Why? Because a weak, straggly plant may produce one fine blossom. Looking at that one blossom so really beautiful you think of the numberless equally lovely plants you are going to have from the seeds. But just as likely as not the seeds will produce plants like the parent plant.

So in seed selection the entire plant is to be considered. Is it sturdy, strong, well shaped and symmetrical; does it have a goodly number of fine blossoms? These are questions to ask in seed selection.

If you should happen to have the opportunity to visit a seedsman's garden, you will see here and there a blossom with a string tied around it. These are blossoms chosen for seed. If you look at the whole plant with care you will be able to see the points which the gardener held in mind when he did his work of selection.

In seed selection size is another point to hold in mind. Now we know no way of telling anything about the plants from which this special collection of seeds came. So we must give our entire thought to the seeds themselves. It is quite evident that there is some choice; some are much larger than the others; some far plumper, too. By all means choose the largest and fullest seed. The reason is this: When you break open a bean and this is very evident, too, in the peanut you see what appears to be a little plant. So it is. Under just the right conditions for development this 'little chap' grows into the bean plant you know so well.

This little plant must depend for its early growth on the nourishment stored up in the two halves of the bean seed. For this purpose the food is stored. Beans are not full of food and goodness for you and me to eat, but for the little baby bean plant to feed upon. And so if we choose a large seed, we have chosen a greater amount of food for the plantlet. This little plantlet feeds upon this stored food until its roots are prepared to do their work. So if the seed is small and thin, the first food supply insufficient, there is a possibility of losing the little plant.

You may care to know the name of this pantry of food. It is called a cotyledon if there is but one portion, cotyledons if two. Thus we are aided in the classification of plants. A few plants that bear cones like the pines have several cotyledons. But most plants have either one or two cotyledons.

From large seeds come the strongest plantlets. That is the reason why it is better and safer to choose the large seed. It is the same case exactly as that of weak children.

There is often another trouble in seeds that we buy. The trouble is impurity. Seeds are sometimes mixed with other seeds so like them in appearance that it is impossible to detect the fraud. Pretty poor business, is it not? The seeds may be unclean. Bits of foreign matter in with large seed are very easy to discover. One can merely pick the seed over and make it clean. By clean is meant freedom from foreign

matter. But if small seed are unclean, it is very difficult, well nigh impossible, to make them clean.

The third thing to look out for in seed is viability. We know from our testings that seeds which look to the eye to be all right may not develop at all. There are reasons. Seeds may have been picked before they were ripe or mature; they may have been frozen; and they may be too old. Seeds retain their viability or germ developing power, a given number of years and are then useless. There is a viability limit in years which differs for different seeds.

From the test of seeds we find out the germination percentage of seeds. Now if this percentage is low, don't waste time planting such seed unless it be small seed. Immediately you question that statement. Why does the size of the seed make a difference? This is the reason. When small seed is planted it is usually sown in drills. Most amateurs sprinkle the seed in very thickly. So a great quantity of seed is planted. And enough seed germinates and comes up from such close planting. So quantity makes up for quality.

But take the case of large seed, like corn for example. Corn is planted just so far apart and a few seeds in a place. With such a method of planting the matter of per cent, of germination is most important indeed.

Small seeds that germinate at fifty per cent. may be used but this is too low a per cent. for the large seed. Suppose we test beans. The percentage is seventy. If low-vitality seeds were planted, we could not be absolutely certain of the seventy per cent coming up. But if the seeds are lettuce go ahead with the planting.

Requisites Of The Home Vegetable Garden

In deciding upon the site for the home vegetable garden it is well to dispose once and for all of the old idea that the garden "patch" must be an ugly spot in the home surroundings. If thoughtfully planned, carefully planted and thoroughly cared for, it may be made a beautiful and harmonious feature of the general scheme, lending a touch of comfortable homeliness that no shrubs, borders, or beds can ever produce.

With this fact in mind we will not feel restricted to any part of the premises merely because it is out of sight behind the barn or garage. In the average moderate-sized place there will not be much choice as to land. It will be necessary to take what is to be had and then do the very best that can be done with it. But there will probably be a good deal of choice as to, first, exposure, and second, convenience. Other things being equal, select a spot near at hand, easy of access. It may seem that a difference of only a few hundred yards will mean nothing, but if one is depending largely upon spare moments for working in and for watching the garden and in the growing of many vegetables the latter is almost as important as the former this matter of convenient access will be of much greater importance than is likely to be at first recognized. Not until you have had to make a dozen time-wasting trips for forgotten seeds or tools, or gotten your feet soaking wet by going out through the dew-drenched grass, will you realize fully what this may mean.

Exposure.

But the thing of first importance to consider in picking out the spot that is to yield you happiness and delicious vegetables all summer, or even for many years, is the exposure. Pick out the "earliest" spot you can find a plot sloping a little to the south or east, that seems to catch sunshine early and hold it late, and that seems to be out of the direct path of the chilling north and northeast winds. If a building, or even an old fence, protects it from this direction, your garden will be helped along wonderfully, for an early start is a great big factor toward success. If it is not already protected, a board fence, or a hedge of some low-growing shrubs or young evergreens, will add very greatly to its usefulness. The importance of having such a protection or shelter is altogether underestimated by the amateur.

The soil.

The chances are that you will not find a spot of ideal garden soil ready for use anywhere upon your place. But all except the very worst of soils can be brought up to a very high degree of productiveness especially such small areas as home vegetable gardens require. Large tracts of soil that are almost pure sand, and others so heavy and mucky that for centuries they lay uncultivated, have frequently been brought, in the course of only a few years, to where they yield annually tremendous crops on a commercial basis. So do not be discouraged about your soil. Proper treatment of it is much more important, and a garden- patch of average run-down, or "never-brought-up" soil will produce much more for the energetic and careful gardener than the richest spot will grow under average methods of cultivation.

The ideal garden soil is a "rich, sandy loam." And the fact cannot be overemphasized that such soils usually are made, not found. Let us analyze that description a bit, for right here we come to the first of the four all-important factors of gardening food. The others are cultivation, moisture and temperature.

"Rich" in the gardener's vocabulary means full of plant food; more than that and this is a point of vital importance it means full of plant food ready to be used at once, all prepared and spread out on the garden table, or rather in it, where growing things can at once make use of it; or what we term, in one word, "available" plant food. Practically no soils in long- inhabited communities remain naturally rich enough to produce big crops. They are made rich, or kept rich, in two ways; first, by cultivation, which helps to change the raw plant food stored in the soil into available forms; and second, by manuring or adding plant food to the soil from outside sources.

"Sandy" in the sense here used, means a soil containing enough particles of sand so that water will pass through it without leaving it pasty and sticky a few days after a rain; "light" enough, as it is called, so that a handful, under ordinary conditions, will crumble and fall apart readily after being pressed in the hand. It is not necessary that the soil be sandy in appearance, but it should be friable.

"Loam: a rich, friable soil," says Webster. That hardly covers it, but it does describe it. It is soil in which the sand and clay are in proper proportions, so that neither greatly predominate, and usually dark in color, from cultivation and enrichment. Such a soil, even to the untrained eye, just naturally looks as if it would grow things. It is remarkable how quickly the whole physical appearance of a piece of well cultivated ground will change. An instance came under my notice last fall in one of my fields, where a strip containing an acre had been two years in onions, and a little piece jutting off from the middle of this had been prepared for them just one season. The rest had not received any extra manuring or cultivation. When the field was plowed up in the fall, all three sections were as distinctly noticeable as though separated by a fence. And I know that next spring's crop of rye, before it is plowed under, will show the lines of demarcation just as plainly.

The Cultivation Of Vegetables

Before taking up the garden vegetables individually, I shall outline the general practice of cultivation, which applies to all.

The purposes of cultivation are three to get rid of weeds, and to stimulate growth by (1) letting air into the soil and freeing unavailable plant food, and (2) by conserving moisture.

As to weeds, the gardener of any experience need not be told the importance of keeping his crops clean. He has learned from bitter and costly experience the price of letting them get anything resembling a start. He knows that one or two days' growth, after they are well up, followed perhaps by a day or so of rain, may easily double or treble the work of cleaning a patch of onions or carrots, and that where weeds have attained any size they cannot be taken out of sowed crops without doing a great deal of injury. He also realizes, or should, that every day's growth means just so much available plant food stolen from under the very roots of his legitimate crops.

Instead of letting the weeds get away with any plant food, he should be furnishing more, for clean and frequent cultivation will not only break the soil up mechanically, but let in air, moisture and heat all essential in effecting those chemical changes necessary to convert non- available into available plant food. Long before the science in the case was discovered, the soil cultivators had learned by observation the necessity of keeping the soil nicely loosened about their growing crops. Even the lanky and untutored aborigine saw to it that his squaw not only put a bad fish under the hill of maize but plied her shell hoe over it. Plants need to breathe. Their roots need air. You might as well expect to find the rosy glow of happiness on the wan cheeks of a cotton-mill child slave as to expect to see the luxuriant dark green of healthy plant life in a suffocated garden.

Important as the question of air is, that of water ranks beside it. You may not see at first what the matter of frequent cultivation has to do with water. But let us stop a moment and look into it. Take a strip of blotting paper, dip one end in water, and watch the moisture run up hill, soak up through the blotter. The scientists have labeled that "capillary attraction" the water crawls up little invisible tubes formed by the texture of the blotter. Now take a similar piece, cut it across, hold the two cut edges firmly together, and try it again. The moisture refuses to cross the line: the connection has been severed.

In the same way the water stored in the soil after a rain begins at once to escape again into the atmosphere. That on the surface evaporates first, and that which has soaked in begins to soak in through the soil to the surface. It is leaving your garden, through the millions of soil tubes, just as surely as if you had a two-inch pipe and a gasoline engine, pumping it into the gutter night and day! Save your garden by stopping the waste. It is the easiest thing in the world to do cut the pipe in two. By frequent cultivation of the surface soil not more than one or two inches deep for most small vegetables the soil tubes are kept broken, and a mulch of dust is maintained. Try to get over every part of your garden, especially where it is not shaded, once in every ten days or two weeks. Does that seem like too much work? You can push your wheel hoe through, and thus keep the dust mulch as a constant protection, as fast as you can walk. If you wait for the weeds, you will nearly have to crawl through, doing more or less harm by disturbing your growing plants, losing all the plant food (and they will take the cream) which they have consumed, and actually putting in more hours of infinitely more disagreeable work. If the beginner at gardening has not been convinced by the facts given, there is only one thing left to convince him experience.

Having given so much space to the reason for constant care in this matter, the question of methods naturally follows. Get a wheel hoe. The simplest sorts will not only save you an infinite amount of time and work, but do the work better, very much better than it can be done by hand. You can grow good vegetables, especially if your garden is a very small one, without one of these labor-savers, but I can assure you that you will never regret the small investment necessary to procure it.

With a wheel hoe, the work of preserving the soil mulch becomes very simple. If one has not a wheel hoe, for small areas very rapid work can be done with the scuffle hoe.

The matter of keeping weeds cleaned out of the rows and between the plants in the rows is not so quickly accomplished. Where hand-work is necessary, let it be done at once. Here are a few practical suggestions that will reduce this work to a minimum, (1) Get at this work while the ground is soft; as soon as the soil begins to dry out after a rain is the best time. Under such conditions the weeds will pull out by the roots, without breaking off. (2) Immediately before weeding, go over the rows with a wheel hoe, cutting shallow, but just as close as possible, leaving a narrow, plainly visible strip which must be hand-weeded. The best tool for this purpose is the double wheel hoe with disc attachment, or hoes for large plants. (3) See to it that not only the weeds are pulled but that every inch of soil surface is broken up. It is fully as important that the weeds just sprouting be destroyed, as that the larger ones be pulled up. One stroke of the weeder or the fingers will destroy a hundred weed seedlings in less time than one weed can be pulled out after it gets a good start. (4) Use one of the small hand-weeders until you become skilled with it. Not only may more work be done but the fingers will be saved unnecessary wear.

The skilful use of the wheel hoe can be acquired through practice only. The first thing to learn is that it is necessary to watch the wheels only: the blades, disc or rakes will take care of themselves.

The operation of "hilling" consists in drawing up the soil about the stems of growing plants, usually at the time of second or third hoeing. It used to be the practice to hill everything that could be hilled "up to the eyebrows," but it has gradually been discarded for what is termed "level culture"; and you will readily see the reason, from what has been said about the escape of moisture from the surface of the soil; for of course the two upper sides of the hill, which may be represented by an equilateral triangle with one side horizontal, give more exposed surface than the level surface represented by the base. In wet soils or seasons hilling may be advisable, but very seldom otherwise. It has the additional disadvantage of making it difficult to maintain the soil mulch which is so desirable.

Rotation of crops.

There is another thing to be considered in making each vegetable do its best, and that is crop rotation, or the following of any vegetable with a different sort at the next planting.

With some vegetables, such as cabbage, this is almost imperative, and practically all are helped by it. Even onions, which are popularly supposed to be the proving exception to the rule, are healthier, and do as well after some other crop, provided the soil is as finely pulverized and rich as a previous crop of onions would leave it.

Here are the fundamental rules of crop rotation:

(1) Crops of the same vegetable, or vegetables of the same family (such as turnips and cabbage) should not follow each other.

(2) Vegetables that feed near the surface, like corn, should follow deep-rooting crops.

(3) Vines or leaf crops should follow root crops.

(4) Quick-growing crops should follow those occupying the land all season.

These are the principles which should determine the rotations to be followed in individual cases. The proper way to attend to this matter is when making the planting plan. You will then have time to do it properly, and will need to give it no further thought for a year.

With the above suggestions in mind, and put to use, it will not be difficult to give the crops those special attentions which are needed to make them do their very best.

The Genesis Of Soil

Soil primarily had its beginning from rock together with animal and vegetable decay, if you can imagine long stretches or periods of time when great rock masses were crumbling and breaking up. Heat, water action, and friction were largely responsible for this. By friction here is meant the rubbing and grinding of rock mass against rock mass. Think of the huge rocks, a perfect chaos of them, bumping, scraping, settling against one another. What would be the result? Well, I am sure you all could work that out. This is what happened: bits of rock were worn off, a great deal of heat was produced, pieces of rock were pressed together to form new rock masses, some portions becoming dissolved in water. Why, I myself, almost feel the stress and strain of it all. Can you?

Then, too, there were great changes in temperature. First everything was heated to a high temperature, then gradually became cool. Just think of the cracking, the crumbling, the upheavals, that such changes must have caused! You know some of the effects in winter of sudden freezes and thaws. But the little examples of bursting water pipes and broken pitchers are as nothing to what was happening in the world during those days. The water and the gases in the atmosphere helped along this crumbling work.

From all this action of rubbing, which action we call mechanical, it is easy enough to understand how sand was formed. This represents one of the great divisions of soil sandy soil. The sea shores are great masses of pure sand. If soil were nothing but broken rock masses then indeed it would be very poor and unproductive. But the early forms of animal and vegetable life decaying became a part of the rock mass and a better soil resulted. So the soils we speak of as sandy soils have mixed with the sand other matter, sometimes clay, sometimes vegetable matter or humus, and often animal waste.

Clay brings us right to another class of soils clayey soils. It happens that certain portions of rock masses became dissolved when water trickled over them and heat was plenty and abundant. This dissolution took place largely because there is in the air a certain gas called carbon dioxide or carbonic acid gas. This gas attacks and changes certain substances in rocks. Sometimes you see great rocks with portions sticking up looking as if they had been eaten away. Carbonic acid did this. It changed this eaten part into something else which we call clay. A change like this is not mechanical but chemical. The difference in the two kinds of change is just this: in the one case of sand, where a mechanical change went on, you still have just what you started with, save that the size of the mass is smaller. You started with a big rock, and ended with little particles of sand. But you had no different kind of rock in the end. Mechanical action might be illustrated with a piece of lump sugar. Let the sugar represent a big mass of rock. Break up the sugar, and even the smallest bit is sugar. It is just so with the rock mass; but in the case of a chemical change you start with one thing and end with another. You started with a big mass of rock which had in it a portion that became changed by the acid acting on it. It ended in being an entirely different thing which we call clay. So in the case of chemical change a certain something is started with and in the end we have an entirely different thing. The clay soils are often called mud soils because of the amount of water used in their formation.

The third sort of soil which we farm people have to deal with is lime soil. Remember we are thinking of soils from the farm point of view. This soil of course ordinarily was formed from limestone. Just as soon as one thing is mentioned about which we know nothing, another comes up of which we are just as ignorant. And so a whole chain of questions follows. Now you are probably saying within yourselves, how was limestone first formed?

At one time ages ago the lower animal and plant forms picked from the water particles of lime. With

the lime they formed skeletons or houses about themselves as protection from larger animals. Coral is representative of this class of skeleton-forming animal.

As the animal died the skeleton remained. Great masses of this living matter pressed all together, after ages, formed limestone. Some limestones are still in such shape that the shelly formation is still visible. Marble, another limestone, is somewhat crystalline in character. Another well-known limestone is chalk. Perhaps you'd like to know a way of always being able to tell limestone. Drop a little of this acid on some lime. See how it bubbles and fizzes. Then drop some on this chalk and on the marble, too. The same bubbling takes place. So lime must be in these three structures. One does not have to buy a special acid for this work, for even the household acids like vinegar will cause the same result.

Then these are the three types of soil with which the farmer has to deal, and which we wish to understand. For one may learn to know his garden soil by studying it, just as one learns a lesson by study.

Vegetable Culture

As a rule, we choose to grow bush beans rather than pole beans. I cannot make up my mind whether or not this is from sheer laziness. In a city backyard the tall varieties might perhaps be a problem since it would be difficult to get poles. But these running beans can be trained along old fences and with little urging will run up the stalks of the tallest sunflowers. So that settles the pole question. There is an ornamental side to the bean question. Suppose you plant these tall beans at the extreme rear end of each vegetable row. Make arches with supple tree limbs, binding them over to form the arch. Train the beans over these. When one stands facing the garden, what a beautiful terminus these bean arches make.

Beans like rich, warm, sandy soil. In order to assist the soil be sure to dig deeply, and work it over thoroughly for bean culture. It never does to plant beans before the world has warmed up from its spring chills. There is another advantage in early digging of soil. It brings to the surface eggs and larvae of insects. The birds eager for food will even follow the plow to pick from the soil these choice morsels. A little lime worked in with the soil is helpful in the cultivation of beans.

Bush beans are planted in drills about eighteen inches apart, while the pole-bean rows should be three feet apart. The drills for the bush limas should be further apart than those for the other dwarf beans say three feet. This amount of space gives opportunity for cultivation with the hoe. If the running beans climb too high just pinch off the growing extreme end, and this will hold back the upward growth.

Among bush beans are the dwarf, snap or string beans, the wax beans, the bush limas, one variety of which is known as brittle beans. Among the pole beans are the pole limas, wax and scarlet runner. The scarlet runner is a beauty for decorative effects. The flowers are scarlet and are fine against an old fence. These are quite lovely in the flower garden. Where one wishes a vine, this is good to plant for one gets both a vegetable, bright flowers and a screen from the one plant. When planting beans put the bean in the soil edgewise with the eye down.

Beets like rich, sandy loam, also. Fresh manure worked into the soil is fatal for beets, as it is for many another crop. But we will suppose that nothing is available but fresh manure. Some gardeners say to work this into the soil with great care and thoroughness. But even so, there is danger of a particle of it getting next to a tender beet root. The following can be done; Dig a trench about a foot deep, spread a thin layer of manure in this, cover it with soil, and plant above this. By the time the main root strikes down to the manure layer, there will be little harm done. Beets should not be transplanted. If the rows are one foot apart there is ample space for cultivation. Whenever the weather is really settled, then these seeds may be planted. Young beet tops make fine greens. Greater care should be taken in handling beets than usually is shown. When beets are to be boiled, if the tip of the root and the tops are cut off, the beet bleeds. This means a loss of good material. Pinching off such parts with the fingers and doing this not too closely to the beet itself is the proper method of handling.

There are big coarse members of the beet and cabbage families called the mangel wurzel and ruta бага. About here these are raised to feed to the cattle. They are a great addition to a cow's dinner.

The cabbage family is a large one. There is the cabbage proper, then cauliflower, broccoli or a more hardy cauliflower, kale, Brussels sprouts and kohlrabi, a cabbage-turnip combination.

Cauliflower is a kind of refined, high-toned cabbage relative. It needs a little richer soil than cabbage and cannot stand the frost. A frequent watering with manure water gives it the extra richness and water

it really needs. The outer leaves must be bent over, as in the case of the young cabbage, in order to get the white head. The dwarf varieties are rather the best to plant.

Kale is not quite so particular a cousin. It can stand frost. Rich soil is necessary, and early spring planting, because of slow maturing. It may be planted in September for early spring work.

Brussels sprouts are a very popular member of this family. On account of their size many people who do not like to serve poor, common old cabbage will serve these. Brussels sprouts are interesting in their growth. The plant stalk runs skyward. At the top, umbrella like, is a close head of leaves, but this is not what we eat. Shaded by the umbrella and packed all along the stalk are delicious little cabbages or sprouts. Like the rest of the family a rich soil is needed and plenty of water during the growing period. The seed should be planted in May, and the little plants transplanted into rich soil in late July. The rows should be eighteen inches apart, and the plants one foot apart in the rows.

Kohlrabi is a go-between in the families of cabbage and turnip. It is sometimes called the turnip-root cabbage. Just above the ground the stem of this plant swells into a turnip-like vegetable. In the true turnip the swelling is underground, but like the cabbage, kohlrabi forms its edible part above ground. It is easy to grow. Only it should develop rapidly, otherwise the swelling gets woody, and so loses its good quality. Sow out as early as possible; or sow inside in March and transplant to the open. Plant in drills about two feet apart. Set the plants about one foot apart, or thin out to this distance. To plant one hundred feet of drill buy half an ounce of seed. Seed goes a long way, you see. Kohlrabi is served and prepared like turnip. It is a very satisfactory early crop.

Before leaving the cabbage family I should like to say that the cabbage called Savoy is an excellent variety to try. It should always have an early planting under cover, say in February, and then be transplanted into open beds in March or April. If the land is poor where you are to grow cabbage, then by all means choose Savoy.

Carrots are of two general kinds: those with long roots, and those with short roots. If long-rooted varieties are chosen, then the soil must be worked down to a depth of eighteen inches, surely. The shorter ones will do well in eight inches of well-worked sandy soil. Do not put carrot seed into freshly manured land. Another point in carrot culture is one concerning the thinning process. As the little seedlings come up you will doubtless find that they are much, much too close together. Wait a bit, thin a little at a time, so that young, tiny carrots may be used on the home table. These are the points to jot down about the culture of carrots.

The cucumber is the next vegetable in the line. This is a plant from foreign lands. Some think that the cucumber is really a native of India. A light, sandy and rich soil is needed I mean rich in the sense of richness in organic matter. When cucumbers are grown outdoors, as we are likely to grow them, they are planted in hills. Nowadays, they are grown in hothouses; they hang from the roof, and are a wonderful sight. In the greenhouse a hive of bees is kept so that cross-fertilization may go on.

But if you intend to raise cucumbers follow these directions: Sow the seed inside, cover with one inch of rich soil. In a little space of six inches diameter, plant six seeds. Place like a bean seed with the germinating end in the soil. When all danger of frost is over, each set of six little plants, soil and all, should be planted in the open. Later, when danger of insect pests is over, thin out to three plants in a hill. The hills should be about four feet apart on all sides.

Before the time of Christ, lettuce was grown and served. There is a wild lettuce from which the

cultivated probably came. There are a number of cultivated vegetables which have wild ancestors, carrots, turnips and lettuce being the most common among them. Lettuce may be tucked into the garden almost anywhere. It is surely one of the most decorative of vegetables. The compact head, the green of the leaves, the beauty of symmetry all these are charming characteristics of lettuces.

As the summer advances and as the early sowings of lettuce get old they tend to go to seed. Don't let them. Pull them up. None of us are likely to go into the seed-producing side of lettuce. What we are interested in is the raising of tender lettuce all the season. To have such lettuce in mid and late summer is possible only by frequent plantings of seed. If seed is planted every ten days or two weeks all summer, you can have tender lettuce all the season. When lettuce gets old it becomes bitter and tough.

Melons are most interesting to experiment with. We suppose that melons originally came from Asia, and parts of Africa. Melons are a summer fruit. Over in England we find the muskmelons often grown under glass in hothouses. The vines are trained upward rather than allowed to lie prone. As the melons grow large in the hot, dry atmosphere, just the sort which is right for their growth, they become too heavy for the vine to hold up. So they are held by little bags of netting, just like a tennis net in size of mesh. The bags are supported on nails or pegs. It is a very pretty sight I can assure you. Over here usually we raise our melons outdoors. They are planted in hills. Eight seeds are placed two inches apart and an inch deep. The hills should have a four foot sweep on all sides; the watermelon hills ought to have an allowance of eight to ten feet. Make the soil for these hills very rich. As the little plants get sizeable say about four inches in height reduce the number of plants to two in a hill. Always in such work choose the very sturdiest plants to keep. Cut the others down close to or a little below the surface of the ground. Pulling up plants is a shocking way to get rid of them. I say shocking because the pull is likely to disturb the roots of the two remaining plants. When the melon plant has reached a length of a foot, pinch off the end of it. This pinch means this to the plant: just stop growing long, take time now to grow branches. Sand or lime sprinkled about the hills tends to keep bugs away.

The word pumpkin stands for good, old-fashioned pies, for Thanksgiving, for grandmother's house. It really brings more to mind than the word squash. I suppose the squash is a bit more useful, when we think of the fine Hubbard, and the nice little crooked-necked summer squashes; but after all, I like to have more pumpkins. And as for Jack-o'-lanterns why they positively demand pumpkins. In planting these, the same general directions hold good which were given for melons. And use these same for squash-planting, too. But do not plant the two cousins together, for they have a tendency to run together. Plant the pumpkins in between the hills of corn and let the squashes go in some other part of the garden.

Wild-Flower Garden

A wild-flower garden has a most attractive sound. One thinks of long tramps in the woods, collecting material, and then of the fun in fixing up a real for sure wild garden.

Many people say they have no luck at all with such a garden. It is not a question of luck, but a question of understanding, for wild flowers are like people and each has its personality. What a plant has been accustomed to in Nature it desires always. In fact, when removed from its own sort of living conditions, it sickens and dies. That is enough to tell us that we should copy Nature herself. Suppose you are hunting wild flowers. As you choose certain flowers from the woods, notice the soil they are in, the place, conditions, the surroundings, and the neighbors.

Suppose you find dog-tooth violets and wind-flowers growing near together. Then place them so in your own new garden. Suppose you find a certain violet enjoying an open situation; then it should always have the same. You see the point, do you not? If you wish wild flowers to grow in a tame garden make them feel at home. Cheat them into almost believing that they are still in their native haunts.

Wild flowers ought to be transplanted after blossoming time is over. Take a trowel and a basket into the woods with you. As you take up a few, a columbine, or a hepatica, be sure to take with the roots some of the plant's own soil, which must be packed about it when replanted.

The bed into which these plants are to go should be prepared carefully before this trip of yours. Surely you do not wish to bring those plants back to wait over a day or night before planting. They should go into new quarters at once. The bed needs soil from the woods, deep and rich and full of leaf mold. The under drainage system should be excellent. Then plants are not to go into water-logged ground. Some people think that all wood plants should have a soil saturated with water. But the woods themselves are not water-logged. It may be that you will need to dig your garden up very deeply and put some stone in the bottom. Over this the top soil should go. And on top, where the top soil once was, put a new layer of the rich soil you brought from the woods.

Before planting water the soil well. Then as you make places for the plants put into each hole some of the soil which belongs to the plant which is to be put there.

I think it would be a rather nice plan to have a wild-flower garden giving a succession of bloom from early spring to late fall; so let us start off with March, the hepatica, spring beauty and saxifrage. Then comes April bearing in its arms the beautiful columbine, the tiny bluets and wild geranium. For May there are the dog-tooth violet and the wood anemone, false Solomon's seal, Jack-in-the-pulpit, wake robin, bloodroot and violets. June will give the bellflower, mullein, bee balm and foxglove. I would choose the gay butterfly weed for July. Let turtle head, aster, Joe Pye weed, and Queen Anne's lace make the rest of the season brilliant until frost.

Let us have a bit about the likes and dislikes of these plants. After you are once started you'll keep on adding to this wild-flower list.

There is no one who doesn't love the hepatica. Before the spring has really decided to come, this little flower pokes its head up and puts all else to shame. Tucked under a covering of dry leaves the blossoms wait for a ray of warm sunshine to bring them out. These embryo flowers are further protected by a

fuzzy covering. This reminds one of a similar protective covering which new fern leaves have. In the spring a hepatica plant wastes no time on getting a new suit of leaves. It makes its old ones do until the blossom has had its day. Then the new leaves, started to be sure before this, have a chance. These delayed, are ready to help out next season. You will find hepaticas growing in clusters, sort of family groups. They are likely to be found in rather open places in the woods. The soil is found to be rich and loose. So these should go only in partly shaded places and under good soil conditions. If planted with other woods specimens give them the benefit of a rather exposed position, that they may catch the early spring sunshine. I should cover hepaticas over with a light litter of leaves in the fall. During the last days of February, unless the weather is extreme take this leaf covering away. You'll find the hepatica blossoms all ready to poke up their heads.

The spring beauty hardly allows the hepatica to get ahead of her. With a white flower which has dainty tracings of pink, a thin, wiry stem, and narrow, grass-like leaves, this spring flower cannot be mistaken. You will find spring beauties growing in great patches in rather open places. Plant a number of the roots and allow the sun good opportunity to get at them. For this plant loves the sun.

The other March flower mentioned is the saxifrage. This belongs in quite a different sort of environment. It is a plant which grows in dry and rocky places. Often one will find it in chinks of rock. There is an old tale to the effect that the saxifrage roots twine about rocks and work their way into them so that the rock itself splits. Anyway, it is a rock garden plant. I have found it in dry, sandy places right on the borders of a big rock. It has white flower clusters borne on hairy stems.

The columbine is another plant that is quite likely to be found in rocky places. Standing below a ledge and looking up, one sees nestled here and there in rocky crevices one plant or more of columbine. The nodding red heads bob on wiry, slender stems. The roots do not strike deeply into the soil; in fact, often the soil hardly covers them. Now, just because the columbine has little soil, it does not signify that it is indifferent to the soil conditions. For it always has lived, and always should live, under good drainage conditions. I wonder if it has struck you, how really hygienic plants are? Plenty of fresh air, proper drainage, and good food are fundamentals with plants.

It is evident from study of these plants how easy it is to find out what plants like. After studying their feelings, then do not make the mistake of huddling them all together under poor drainage conditions.

I always have a feeling of personal affection for the bluets. When they come I always feel that now things are beginning to settle down outdoors. They start with rich, lovely, little delicate blue blossoms. As June gets hotter and hotter their color fades a bit, until at times they look quite worn and white. Some people call them Quaker ladies, others innocence. Under any name they are charming. They grow in colonies, sometimes in sunny fields, sometimes by the road-side. From this we learn that they are more particular about the open sunlight than about the soil.

If you desire a flower to pick and use for bouquets, then the wild geranium is not your flower. It droops very quickly after picking and almost immediately drops its petals. But the purplish flowers are showy, and the leaves, while rather coarse, are deeply cut. This latter effect gives a certain boldness to the plant that is rather attractive. The plant is found in rather moist, partly shaded portions of the woods. I like this plant in the garden. It adds good color and permanent color as long as blooming time lasts, since there is no object in picking it.

There are numbers and numbers of wild flowers I might have suggested. These I have mentioned were not given for the purpose of a flower guide, but with just one end in view your understanding of how to

study soil conditions for the work of starting a wild-flower garden.

If you fear results, take but one or two flowers and study just what you select. Having mastered, or better, become acquainted with a few, add more another year to your garden. I think you will love your wild garden best of all before you are through with it. It is a real study, you see.

Conclusion

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