S.H.A.R.E. PRESENTS

SEED TO SEED

GROWING A SUNFLOWER GARDEN WHEREVER YOU ARE

PREPARED AND PRESENTED BY

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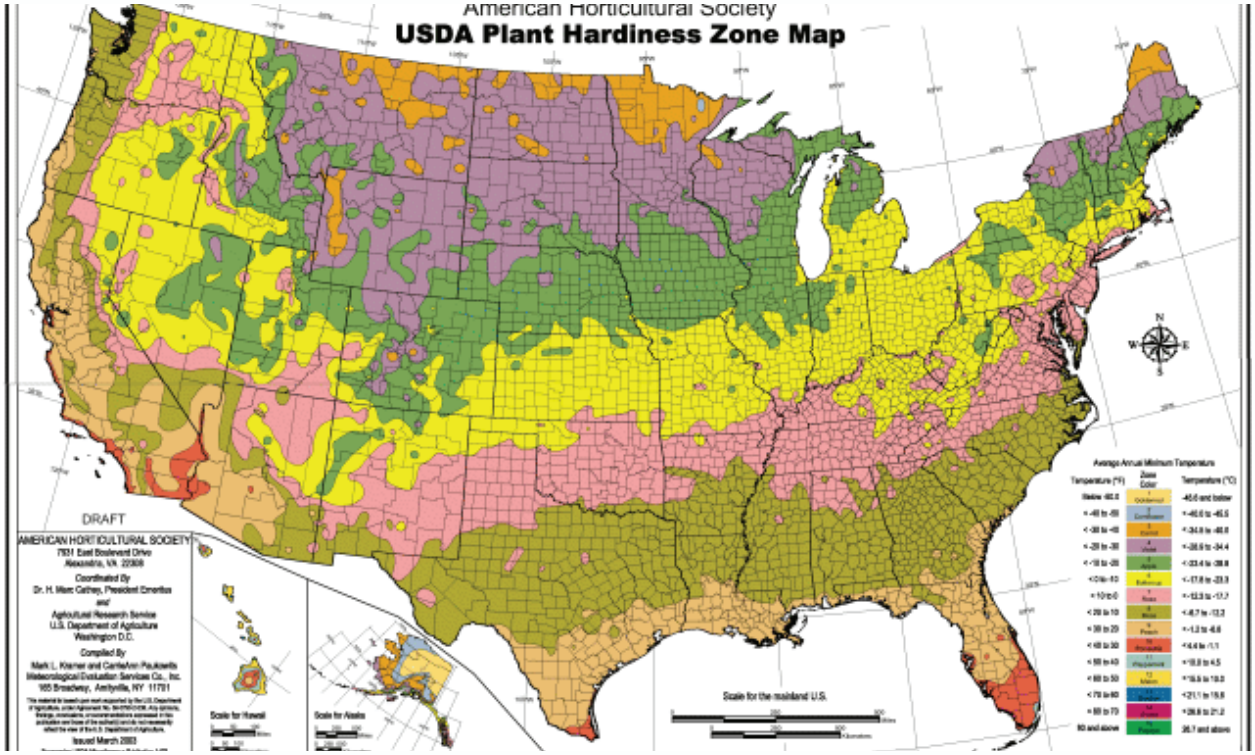
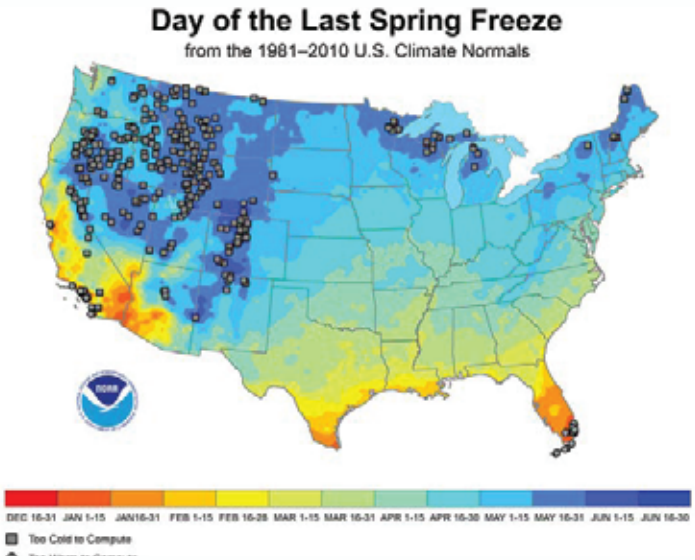
WHERE ARE YOU?

Zone: the USDA Plant Hardiness Map



"ZONE" IS A REFERENCE TO THE USDA PLANT HARDINESS ZONES



The USDA divided North America into zones based on the average annual **minimum** winter temperature. The cutoff between zones is every 10 degrees Fahrenheit, with Zone 1 being the very coldest zone (in the far North, average winter minimum below -50˚F).

Zones 4 and 5 represent much of the interior of the United States.

The map to the left shows the approximate date of the last frost across the United States. This is a helpful reference before sowing seeds whether indoors or out.

In most of the US, the last frost occurs between mid-April and mid-May.

Light and Aspect

These terms are related because they both relate to how much sun that a growing plant may get. Aspect relates to the timing and intensity of sunlight, whereas light relates to the amount of time the plant is exposed to sunlight.

ASPECT WHICH WAY MOST LIGHT COMES FROM	LIGHT HOW MUCH DIRECT SUN THE PLANT GETS EVERY DAY
NORTH RECIEVE LESS SUNLIGHT TEND TO BE COOLER	**FULL SUN** 6 OR MORE HOURS OF SUNLIGHT DAILY
SOUTH RECEIVE MORE SUNLIGHT TEND TO BE WARMER MAY BE TOO DRY	**PART SUN** 4 TO 6 HOURS OF SUNLIGHT DAILY
EAST RECIEVES MOST SUN IN THE MORNING	**PART SHADE** 2 TO 4 HOURS OF SUNLIGHT DAILY
WEST RECIEVES MOST SUN IN THE EVENING	**FULL SHADE** LITTLE TO NO SUN

Soil type

NOT ALL SOIL IS CREATED EQUAL!

There are six general categories of soil: Clay, silty, sandy, peat, chalk and loam.

Clay soils are lumpy and sticky when wet and extremely hard when dry. They tend to not drain well. That is to say, tater pools on top, but does not flow well through a clay soil.

Silty soils are generally soft and easy to cultivate. They are often rich in nutrients, they hold water and drain well.

Sandy soils are gritty. The sand makes it easy for water to flow in, but then flow back out again leading to rapid drying.

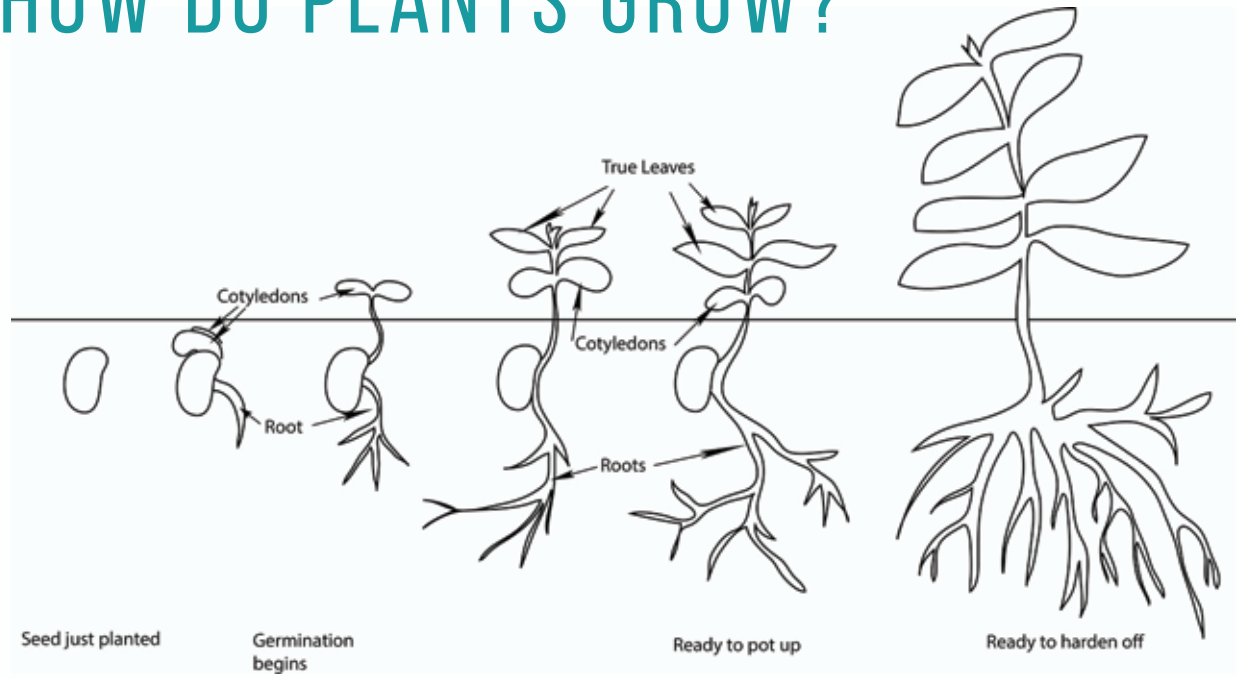
Peaty soils feel spongy because of the organic matter (peat) composing the bulk of the soil. They tend to be slightly acidic and retain water to such an extreme that drainage is really important.

Chalky soils tend to be stony. It drains well, but is often alkaline.

Loam soils are an even mix of sand, silt, and clay which makes it ideal for gardening. It drains well and retains nutrients.

Amendments are materials mixed into soil to help improve its water drainage and retention characteristics, its nutrients, and/or its chemistry

HOW DO PLANTS GROW?



Germination

Inside the seed lies the embryo of a plant When the seed GERMINATES, the embryo begins to develop roots that go down At the same time, the plant's first leaves push out of the seed case and grow upwards.

Cotyledons

The first leaves to form are called COTYLEDONS. They exist within the seed, and while they are leaves, they are distinct from the rest of the leaves that the plant will grow later.

Some cotyledons contain chlorophyll and are able to photosynthesize. Others contain nutrients and function like the plant version of a yolk sac, providing nutrition to the growing plant until it is able to produce enough of its own food through photosynthesis.

Monocots versus Dicots

MONOCOT (MONO = 1; COT = COTYLEDON)
DICOT (DI = 2; COT = COTYLEDON

The first leaves to be visible are the cotyledons. Often they are a different shape than the mature leaves.

The photo below shows the cotyledons of a plant that have just come up. Because there are two, this plan is a dicot.

This is what radish seedlings look like.

Most garden flowers are dicots.

Grasses on the other hand have only one embryonic leaf and re called monocots.

Corn is a monocot.

Starting seeds

THREE MAIN WAYS TO GROW PLANTS FROM SEED AT HOME

DIRECT SOW
AFTER THE LAST FROST

STARTING INDOORS
WEEKS BEFORE THE LAST FROST

WINTER SOWING
OUTSIDE DURING WINTER

DIRECT SOW

The easiest way to grow plants from seeds is to plant them directly in the ground where you want them to grow.

The caveat is that this must be done after the risk of frost is past. Frost will kill tender seedlings. Plus you have to consider how long the plants need to be able to flower or fruit successfully.

START INDOORS

When you live in a part of the world with a short growing season, it is often to start seeds - that is germinate them and get them to a stage where they have true leaves - in a safe space away from frost. When the plants are mature enough, they can be transplanted outdoors.

Starting seeds indoors is not without its challenges. There are some simple mini-greenhouse kits that provide the soil, pots, and watering requirement for common seeds like tomatoes.

It's important to get the timing right so that the plants are ready just as outdoor conditions become perfect

WINTER SOWING

There are some seeds that require a period of freezing before they will germinate. Those seeds may be direct sown in winter. This is just like the direct sow discussed above, where the seeds are put where they're intended to grow outside, but this process is done in the winter so that the seeds experience the freeze-thaw cycles required for germinateion.

READING SEED PACKETS

Seed packets have all the information you need to know if you can grow them at home: Where they like to grow, how to start them, and their needs as they mature.

ANNUAL OR PERENNIAL

Most garden plants are in one of two groups: Annuals or perennials.

Annuals grow during the warm weather and are killed by winter cold. They have to be replaced every year. These tend to have bright flowers that bloom throughout the summer

Perennials come back every spring. They have a limited flowing season. The time of flowering is also listed on the seed packet.

WHERE YOU LIVE VS WHAT THEY LIKE

Most seed packets include at a minimum the light requirements of a plant. Many include aspect as well. You can also look this up in books and online.

Compare this to what you know of your region to determine if the plants will be successful at your home.

The soil is often critical for success, but not always listed. Most plants do best in a loamy soil, so you can amend the soil bed where you plan to plant the seeds before sowing them.

"DAYS"

Vegetables and fruit often have an additional bit of information called "Days."

Days is the number of days needed between germination of the seed and to be able to harvest the fruit or vegetable.

Using the USDA Plant Hardiness Zone chart above,, as well as digging into first and last dates of frost, you can determine of the vegetable you want to grow will even be able to mature to harvest.

Starting seeds indoors can help lengthen the growing season if you only need a few extra weeks.

What's on the seed packet?

HOW TO START THE SEEDS

Seed packets include information on how to start the seeds using the same or similar categories as already explained.

The packets also include more details such as how long before the last frost seeds should be started to insure success.

The packet may also explain things like whether seeds need to be frozen, soaked, or scored (lightly cut) before planting.

A packet may also mention depth, which is how deeply to bury the seed. Some seeds do best if they're set only on the surface. Others need to be buried perhaps half an inch. Having the correct depth ensures that the seed is not buried so deeply that it's cotyledons cant reach the surface, but not so shallowly that they dry out before setting roots.

NEEDS OF MATURE PLANTS

You'll see terms like height, spacing, and season on a packet.

HEIGHT tells you approximately how tall the mature plant will be

SPACING is approximately how far apart mature plants need to be to ensure there is space for their roots such that they don't have to compete. Usually when we sow seeds directly, we place them much closer together than the recommended spacing. This means that later we'll have to remove some seedlings to make sure what's left will grow well.

SEASON is a term for approximately when during the growing season the flowers will bloom. It's usually things like 'early spring' or 'mid fall.' This is helpful if you want to plant a garden and make sure something is blooming all summer long.

SUNFLOWERS

WHAT DISTINGUISHES SUNFLOWERS FROM OTHER FLOWERS?

SUNFLOWERS DO BEST IN THE SUN

Most sunflowers belong in the genus *Helianthus*, which means 'sun flower'

HELI = SUN, ANTHUS = FLOWER

Sunflowers are native to North, South, and Central America. Most cultivars (that is, types that you can buy to grow) are *Helianthus annuus*.

H. annuus is an annual that may self-sow over winter, which means that the previous season's seeds may drop and germinate into the current season's flowers.

Wild native sunflowers prefer to be kept dry and do best in clay or heavy sandy soils.

They all require lots of sun.

In North America, most of the time direct sowing after the last frost is the best way to start sunflowers, but in more northern regions it may make sense to start them inside.

There are many varieties, including those for eating and those for display.

WHAT IF YOU DON'T HAVE MUCH SUN?

There is a variety of sunflower called the woodland sunflower, *Helianthus divaricatus*.

H. divericatus is a perennial native to North America that does well in part sun to part shade, and actually doesn't like full sun all that much.

S.H.A.R.E. FOUNDERS

MARIE GAIL STRATFORD

Movement, Painting, Rhythm, Space

Marie Gail "MG" Stratford is a recreational therapist, artist, and holistic creative facilitator whose experience ranges from direct client care in psychiatric facilities to teaching dance to high-risk middle school students in inner cities. Today, she brings her understanding of the healing effects of recreational creativity to individuals of all ages.

PENNY HIGGINS

Cats, Digital Art, Photography, Paleontology

Penny is a paleontologist with a passion for cats. She spends about a month every summer camping and collecting fossils throughout the "Wild West," and the rest of her year is spent caring for cats, drawing pet portraits, and writing the occasional technical manuscript. Her passion is to provide education in science while balancing the deep emotional implications of scientific revelation.
