



Cedar Rim Nursery

Class Bulletin

Class # 8

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Seed Starting & Plant Propagation

Background Info:

Different Types of Seeds:

HA: Hardy Annuals: these types of plants are those that complete their life cycle within 1 year. Their seeds are sown in early spring and they mature and bloom that summer. After blooming has occurred, these plants will set and release seed, if allowed, and will then die. Many flowers within this group may be sown directly outdoors in the garden.

HHA: Half-hardy Annuals: plants within this group are similar to the aforementioned plants with the exception that they require a longer period of growth. To provide this extra time, these seeds must be sown indoors in early spring and given a warm, lighted spot.

NOTE: half hardy also refers to plants that are frost tender and mustn't be planted outdoors until all danger of frost has passed. They must be gradually hardened off before transplanting.

HB: Hardy Biennial: these plants' seeds are sown in spring or summer and then the young plants are transplanted to their flowering position in fall or the following early spring. They will flower approximately 12 months after they have been sown.

HHP: Half-hardy perennial: seed of these plants must be sown indoors or in a heated greenhouse in early spring and will then flower the same year. Example of these are: Gazania, Geraniums, Gerbera, Impatiens, and Mimulus.

HP: Hardy perennial: these plants can have their seed sown in the same manner as hardy biennial. However, many gardeners prefer to sow their seed

indoors in March or April. The young plants are then set out into the garden when they are large enough to transplant.

NOTE: the actual date for sowing seeds will vary from season to season and with regard to where you live. If the season is cold and late, it is better to wait and sow your seeds later than normal since earlier sowings will probably suffer from the unseasonable cold. These later sown plants will catch up and will perform just as well.

Special Treatment of Seeds:

Some types of seeds require special treatment before they are sown to encourage proper germination.

Soaking: this process is necessary to soften the hard seed coat and to allow the seed to germinate. Soaking also allows for any chemical inhibitors to be leached out of the seed coat and therefore sends the signal to the seed to begin germination. Soaking may be done for 1 – 3 hours with warm water. If soaking for longer periods, be sure to change the water daily. Some types of seeds will swell with this process and any that do swell within 24 hours should be planted immediately. Any seeds that have not swelled can be pricked with a pin and returned to the warm water. Soaked seeds need to be planted before they are allowed to dry.

Chipping: some seeds have such a hard seed coat that they require some type of abrasion to allow moisture to be taken up in order to germinate. The outer surface of the seed coat must be scratched and chipping the seed slightly with a sharp knife or a piece of sandpaper can do this. Small seeds can be chipped with a needle.

NOTE: Some seed companies have pre-treated their seeds in this manner before packaging, so examine them carefully before performing this treatment.

Pre-chilling: this process is necessary for seeds that are too slow to germinate otherwise. Traditionally, leaving the potted, sown seeds outdoors in a cold frame during the winter did this. However, now the home gardener can save a lot of time by using the refrigerator. To pre-chill, one must sow the seed on moistened soil (seed starter) in a sealed container (usually a clean, plastic bag) and leave at 15 – 18°C (60 – 65F) for 3 days and then place in the fridge for the recommended period for that particular seed. Always be sure that there is enough air inside the bag to prevent the soil from drying out or becoming too moist. After pre-chilling, the seed can be removed and spread on top of a seed container and firmed down.

NOTE: the seeds must be moist when they are being pre-chilled, but not in water. While the seeds are in the fridge, examine them weekly and remove any seeds to their pots if they have started to germinate. It has also been

discovered that many seeds benefit from light after pre-chilling, so only cover them with a minimal amount of soil.

Double Dormancy: some seeds have a combination of dormancies that must be broken in the proper order to allow for germination. For example, some lilies must go through a period of warmth during which the root starts to develop and then a period of cold to break the dormancy of the shoots. Some seeds require the opposite steps before they will germinate. To be sure, you must be familiar with the type of seed that you are growing.

Outdoor Treatment: this refers to the longer, but just as effective, treatment of seeds in which they are left outdoors in a cold frame or bed to go through the effects of pre-chilling and/or warming. It is best to use a free draining soil and the pots should be placed out in a shaded area of the garden or on the north side of the house out of the hot sun and away from drying winds.

NOTE: to protect your seeds from predators, you can place a piece of glass atop the pots or use chicken wire to cover them.

Direct Sowing:

The key to starting seeds outdoors directly is the preparation. The sowing site must be in suitable condition in order to encourage the best overall germination and future growth. The soil should be free of weeds, large stones, and debris and broken down to a fine tilth with a rake or fork.

Often a special seedbed is created for sowing vegetables, some hardy annuals, and tree seeds. An open, but sheltered spot is chosen and holes are drilled into the soil at specific depths for the seed. This can be done with the reverse side of a rake head or with the tines of the rake being dragged across the soil surface to create a u-shaped drill.

One of the most important things is that the seed is in good contact with the soil. If the soil is dry, moisten the drill thoroughly before sowing.

After sowing the seed, rake soil over the drills or cover the seeds with peat and firm the area with the flat face of the rake. Be sure to label the drills with the appropriate seed variety and sowing date.

Annual seeds can be sown directly into those parts of the garden where they will eventually flower. Choose a site that is well drained and sunny and sow the seeds in patches to have the best even coverage. The minimum soil temperature should be 10C and fertilizer is not necessary, although a light dressing of organic matter can be dug into the first few inches of soil. These annual seeds can also be covered lightly and then firmed with the rake.

When the seed has germinated, it will be necessary to thin out the seedlings to avoid overcrowding. This should be done soon after emergence and a second thinning may be necessary later on.

Undercover Sowing: The love of gardening is a seed once sown never dies.

Gertrude Jekyll

Annual – a plant that germinates, flowers, produces seeds and dies within one year.

Biennial – a plant that produces vegetative growth in its first year, flowers in its second season, and then dies.

Perennial – any plant that normally lives for more than two years.

Damping off – a lethal disease of seedlings caused by soil-borne fungi.

Dormancy – a general term denoting a lack of growth of seeds.

Seed – the mature ovule of a flowering plant containing a mature embryo.

Undercover Sowing

Cleanliness is one of the most important and necessary things that you have to worry about when you are going to start to germinate seeds.

- Trays and pots should be sterilized before use.
- Fresh compost should be used each season.
- Treat emerging seedlings with Damp-Off.

Most seeds germinate best, if clear plastic domes cover the seed trays. These domes are available in 3 and 6” height. They are used to retain the moisture in the compost. Some seeds may need to germinate in the dark; you can simply cover the dome with a sheet of newspaper and leave it in a light, warm place. A daytime temperature of 65-75F, with a drop at night to about 55F is good. When the seedlings have emerged, the daytime temperature should be a little lower to about 65F.

Sowing Biennials and Perennials

Biennials can be sown in seed trays where they can grow undisturbed until ready for transplanting. Seeds that are sown in the spring will result in plants that are sturdy enough to be moved out into the garden in the fall, normally when the summer bedding plants are finishing off.

Some perennials can be sown indoors early in the spring and then transplanted out in late spring to flower during that summer. However the majority of perennials can be grown in the nursery bed during the spring and summer, and

then planted out to their permanent positions in the fall, to flower the following season.

Unlike annuals, which only last the one-year, perennials will occupy the same garden for years. Thorough preparation of the soil is important to ensure the plants enjoy a long life.

Sowing Trees and Shrub Seeds

These seeds can usually be sown at any time of the year. It is helpful to pre-chill the seeds and most large seeds benefit from a soaking in luke warm water for 1-2 hours before sowing. Free draining seed compost is preferred. Sow seeds into individual pots, which should be labeled and then enclosed in a clear plastic bag to prevent moisture loss. Place the pots on a well-lit but not sunny windowsill. Once the seedlings start to emerge, remove the bag and lower the temperature to around 60F. Give the seedlings plenty of light but shade from the strongest rays of sun. An alternative method, which is pretty foolproof but slower is to plunge the pots, after sowing, up to the rims in a shady part of the garden or in the cold frame. It helps to cover the pots with a large upturned jam jar or piece of glass. The compost must always be moist but never soggy.

Germination can take over 12 months in some cases.

When the seedlings are large enough to handle, carefully transplant into pots of similar potting compost and grow in a cool and well-lit site. Once the seedlings show signs of becoming established, plunge the pots out into the shady sheltered part of the garden and bury them up to the top rim of the pot. Keep the pots well watered during the spring and summer. Plant out into a reserve garden in the fall and hold for 2-3 years until they have reached a size that they can then be transplanted to their final position.

Coping with Tiny Seeds

Tiny seeds that are as fine as dust can be difficult to handle. Here's how to successfully deal with this task.

- use small pots for sowing, 4-5 inch is adequate
- fill the pots to overflow with seed starting compost, then firm down into the pot.
- pour a heaping teaspoon of silver sand into the seed packet and shake to mix the sand and seeds.
- sow the seed direct from the package, tapping it slowly to release the sand-seed mixture evenly over the compost.
- do not cover the seed with compost, simple press them into the surface with a spoon.
- water the compost from underneath by standing the pots in tepid water.

- cover with a piece of glass, cling wrap or seal in a clear plastic bag to keep the moisture in the compost and the air humid.
- Fine seeds have a lower rate of germination than the normal-sized seeds. So the correct temperature for germination is very important.

Pricking Out

When the seeds germinate the first set of leaves that appear are the cotyledons or seed leaves. These are usually oval, fleshy leaves that bear no resemblance to the mature leaves of the plant.

It is said the seedlings should not be pricked out or transplanted until the first true leaves appear, but you must use common sense and move them only when they are large enough to handle. However in the case of large seedlings this may be before the true leaves have developed.

The golden rule is to never handle the seedlings by their stems, which bruise very easily, but always by their seed leaves. Some people use a sharpened piece of wood or a metal device called a widger to separate and ease out the seedlings, taking care not to damage the delicate roots.

It is good planning to prepare your planting holes in the well-moistened compost before you actually lift out the seedlings from the sowing container. Place the seedling into position with the roots falling neatly into the hole, and then gently firm the compost into contact with the seedling, while still holding it by the seed leaves.

Hardening Off

The final operation before planting out your seedlings is to harden them off. The idea is to slowly acclimatize the seedlings to the harsher conditions of the outdoors. Allow a minimum of ten days or more to do this. Start by putting the trays of seedlings out in a sheltered place outdoors for two hours during the day and lower the temperature of the greenhouse or place that you have the seedlings stored, for the rest of the day. Increase the length of period that the plants stay outdoors each day, so that by the time the frosts have ended, the plants are fully conditioned to being outside. Don't forget to water the trays, but protect from rainfall.

Damping-off

This term is used to describe underground, soil line, or crown rots of seedlings due to unknown causes are damping-off.

The seedlings will discolour or wilt suddenly or simply collapse and die. Above ground symptoms of root rot will include stunting, low vigor or wilting on a warm day. The seedlings may have yellow leaves that will fall prematurely starting with the oldest leaves first.

Ways to prevent damping-off

- use sterile well drained soils
- seeds must not be covered more than 4 times their thickness
- plants must not have their crowns below the soil line
- use pots with drainage holes and do not allow pots to stand in excess water
- avoid overcrowding and overfeeding of plants
- avoid spreading infected soil from one place to another, disinfect tools with one part bleach to four parts water
- sow all your seeds on top of the growing media, then cover the seeds to the right depth with a material less likely to harbor fungi; milled sphagnum moss, chick grit, coarse sand
- mist seedlings once or twice a day with water containing a anti-fungal agent such as; Captan, chamomile tea, clove tea, a one time dusting of powdered cinnamon on the soil surface
- provide constant air movement (very important)

Fungicides can be applied as a soil drench after planting or they can be incorporated into the soil before planting as a dust. Or they can be sprayed in mist form on the seedlings. Once transplanted, only those seedlings that are sensitive to damping-off need to be misted daily until the first or second seed leaves have been produced. Good Luck!

Easy Cold Frame

A few sheets of ½ inch plywood will make a quick and easy cold frame.

Seed requirements of some Common Flowers

Sweet Peas

Germination time: 14 days

Start indoors: 6-8 weeks

Germination temp: 55-65 degrees F.

Sowing depth: ¼ inch

Bloom time: early spring-early summer

Colour range: blue, pink, rose, white

Location: full sun

Attractions: vine type needs support, fragrant

Snapdragons

Germination time: 7-14 days

Start indoors: 10-12 weeks

Germination temp: 75 degrees F.

Sowing depth: surface sow

Bloom time: late spring-early fall

Colour: apricot, burgundy, pink, rose, yellow

Location: full sun

Attractions: come in several heights, pinch back after bloom to encourage second flowering

Geraniums

Germination time: 14 days

Start indoors: 10-12 weeks

Germination temp: 70-80 degrees F.

Sowing depth: just cover

Bloom time: late spring summer

Colour: pink, red, salmon, white

Location: full sun, dry conditions

Attractions: can be wintered over for planting next spring

Petunias

Germination time: 7 days

Start indoors: 8 weeks

Germination temp: 80 degrees F.

Sowing depth: surface sow

Bloom time: summer-fall

Colour: purple, red, pink, white, yellow, coral, lavender, bi-colour

Location: full sun

Attractions: good for window boxes and hanging baskets

Cuttings

Again much like starting seeds, you must start with clean tools, sterile soil mix and have the time to plant soon after you have taken the cuttings so they do not dehydrate.

You want to take cuttings of the new growth from the plants in the late spring. As plants are growing best at this time of the year, they will make good root growth at this time.

The best time to take cuttings is first thing in the morning, before the sun is too hot. Have a plastic bag with you to place the cuttings in so they do not wilt. You may want to put the cuttings in a bucket of water if you are not ready with your pots.

Fill your 4-inch pots with Exel Starter Mix, 1 inch below the lip of the pot, firm the soil lightly. Always cut the stems on an angle giving more cut surface to start roots from. It is best to make your cut $\frac{1}{2}$ inch below the leaf node. Now stripe off the lower sets of leaves, leaving only the top leaves. If these leaves are really big then cut them in half.

Now with a pencil press a hole in the middle of the soil in your pot. Then drip your stem in the rooting hormone powder and place the stem in the hole. Firm the soil around the stem and water the soil well. Now place a plastic bag over the pot and tie it off to make a greenhouse effect. Set the pots in a bright, warm window. Open the bags every day for 10-15 minutes to circulate the air.

Cuttings will vary in how long it will take them to root in. Some it takes only a few days, while others it may take weeks. After about a week check by giving your plants a gentle tug on the stem, if there is resistance the roots are forming. Start now with a weak fertilization solution.

Always take more cuttings than you want, as not all will survive. **GOOD LUCK!!**

