PLANT PROPAGATION

VIA

SEEDS

(Sexual Propagation)

PLANT PROPAGATION – THE ART AND SCIENCE OF MULTIPLYING PLANTS

- **Sexual methods**
  - **Seed propagation –** this presentation
  - Flowering plants are called **Angiosperms**

- **Asexual methods –** covered later
  - Cuttings
  - Layering
  - Division
  - Grafting and budding
  - Tissue culture / micro-propagation
  - And more!

SEXUAL OR SEED PROPAGATION PRO AND CONS

PROs:

- Seeds are widely available and inexpensive
- Seeds are easy to handle, store and transport
- Commercial seeds have high standards
- Hybrid seeds may produce progeny better than parents
- Large scale agriculture is dependent upon seeds

CONs:

- Seeds (especially seeds of woody plants) may have complex dormancies that impede germination
- Can lack uniformity – especially seeds collected in a garden or in the wild
- Longer Time to Maturity
- May not produce viable seed

WHEN IS ASEXUAL PROPAGATION, OR CLONING, PREFERRED OVER SEXUAL PROPAGATION (SEEDS)?

- **Some plants produce few (if any) viable seeds**
- **Clonal progeny are highly uniform in all characteristics**
- **Plants may have an extended juvenile period, making growing from seed a lengthy process**
- **Seeds may have lengthy and complex dormancies**

Right now, we are talking about seeds, the product of Sexual Propagation, so we will not be talking about Asexual or Cloning Propagation until later.

LET'S LOOK AT YOUR SEED PACKET

CERTIFIED SEED

Read the packet for success!

Is it Heirloom? Is it a Cultivar?

How much sun does it need?

How many days until maturity?

Is it indeterminate or determinate? (tomatoes only)

Vine or bush? (used for beans, squash and cucumber plants)

Whether it can be transplanted

Planting Depth

Soil Temperature for germination

Days to Germination

Plant spacing

CERTIFIED SEED

Read the packet for success!

Is it Heirloom? – It has been grown over and over, passed down, will breed true
Is it a Cultivar? – It has been bred to have certain characteristics, such as disease resistance or a certain height.
How much sun does it need?
How many days until maturity?
Is it indeterminate or determinate? In tomato plants, determinate means the genetic code determines it will reach a certain height, then set all its fruit in a short time. Indeterminate means it will continue to grow and set fruit over a period of time, perhaps until frost.
Vine or bush? (used for beans, squash and cucumber plants) Vines like to grow vertically (with support); bush likes to grow horizontally
Annual / Perennial
Whether it can be transplanted or if it wants to be sown where it will grow (sunflowers are like that – don't transplant well)
Planting Depth
Soil Temperature for germination
Days to Germination
Plant spacing
A date indicating what season the seeds are packed for

WHAT DO SEEDS NEED TO GERMINATE?

ALL seeds need:

- Water
- O_2 • Oxygen
- F° • Proper Temperature in order to **germinate**

Some seeds require

- Proper Light also:
  - ✓ Some germinate better in **full light**, while
  - ✓ others require **darkness** to germinate.

When a seed is exposed to the Proper conditions, water and O_2 oxygen are taken in through the seed coat.

We usually place seeds in or on damp soil, to germinate.

SEED VIABILITY TEST

"How Good Are My Seeds?"

VIABILITY OR GERMINATION TEST FOR SEEDS p. 1 of 2

- Soak a paper towel (or coffee filter or a piece of blotter paper) in Water; squeeze it out so that it is damp but not dripping wet, and at an appropriate temperature.
- Unfold and spread the damp paper towel out.
- Take a Sample of 10 Seeds.
- Spread the seeds over HALF the sheet.
- Fold the other half over the seeds; roll it up; you can put a rubberband 1" from the top if desired.
- Place it in a clear plastic ziplock or an airtight container to keep it from drying out.
- Keep at about 75°: 75° or a little cooler for cool season crops, 75° or a little warmer for warm season plants. For warm season plants, a sunny window sill or on top of the refrigerator may work

VIABILITY OR GERMINATION TEST FOR SEEDS p. 2 of 2

- Wait the number of days suggested on the seed package for germination, perhaps a few more, then open and count the number of sprouts. Typically, this is 7-10 days. Only count sprouts that have both a healthy-looking root and a healthy-looking shoot.

- You can remove the sprouted seeds, then spray the remaining seeds with water and fold or roll it back up. Continue to check every few days for sprouts, until you have concluded that all the viable seeds have germinated. If you haven't seen a new sprout for a while, the test is probably done.

- Multiply the number of sprouts by 10 to get the germination rate: For example, 7 sprouts x 10 = 70% viability / germination rate.

- Large seeds like peas, corn and beans will need more water.

Within the ANGIOSPERMs,

There Are 2

"Traditionally Recognized" Classes:

MONOCOTS & DICOTS

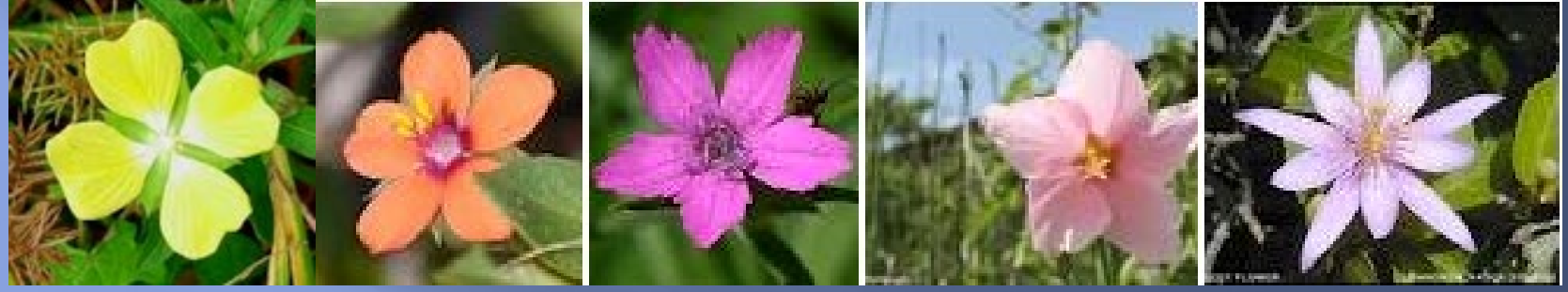
What Follows Are the Traditionally Listed Differences between Monocots & Dicots.

They Are NOT Invariably Applicable – There are a Number of Exceptions.

The Differences Are More True For Monocots Than Dicots.

Monocots

- A monocot has only one seed leaf
- Monocots have parallel leaf veins and scattered vascular bundles in the stem
- Monocots have a primary root of short duration, replaced by adventitious roots forming fibrous or fleshy root systems
- Most monocots are small, herbaceous plants. Many monocots have a single, un-branched stem which dies down each year.
- Another family is True Grasses (Poaceae) – economically the most important family (rice, wheat, barley, sweet corn, etc.; forage grasses, turf grasses, sugar cane, bamboos, palms, bananas, gingers, tumeric and cardamom, gingers & garlic)
- Horticultural bulbs, such as lilies, daffodils, irises, amaryllis, cannas, bluebells and tulips are all monocots



Dicots

- Group of Plants that have two embryonic leaves or cotyledons
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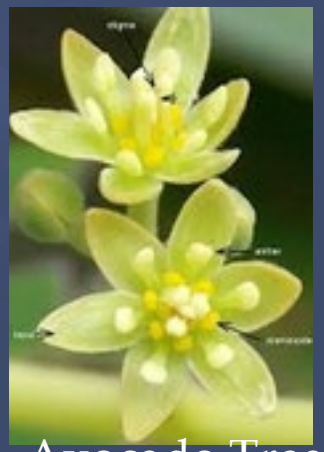
Tulip Poplar Tree

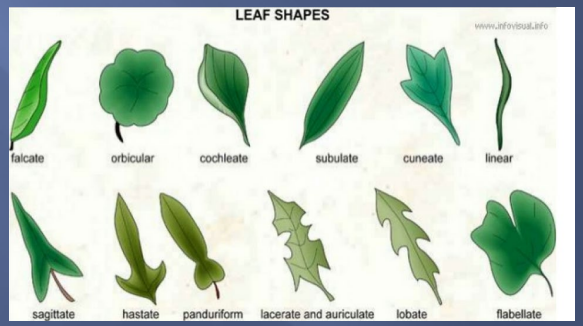
Magnolia Tree

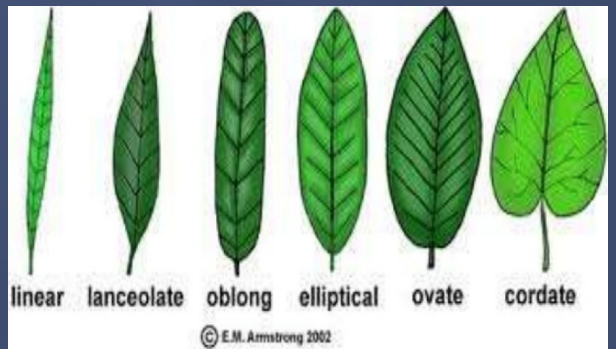


Avocado Tree

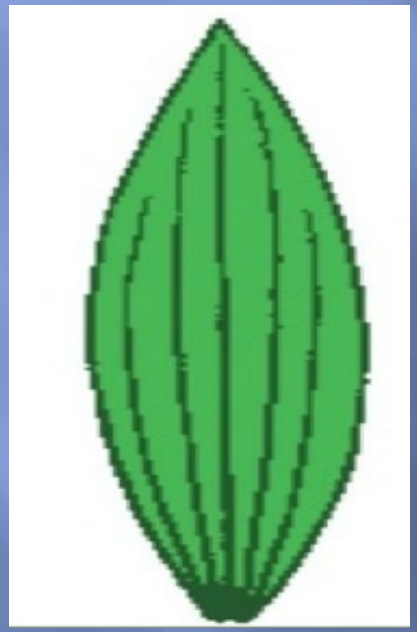
Dicots p. 2 of 2

- The root of dicots develops from the radicle (lower part of the axis of an embryo; the primary root). The Primary root often persists, forming a strong taproot and secondary roots.
- Leaves of dicots come in many different shapes, and the veins spread out from the central midrib and criss-cross all over the leaf, rather like the branches of a tree
- Dicots come in all shapes and sizes. One of the reasons for this is that large plants need a good support system, which is provided in dicots by the woody stem and root.





MONOCOT & DICOT LEAVES



Monocots:

Leaves have parallel veins

Dicots:

Leaves have net-like veins

BEAN/CORN CUP

STARTING SEEDS

When Starting Seeds:

Use New Pots, or

Sterilize Seed Pots or Flats by Soaking in:

1 Part Bleach

5 Parts Water

for a minimum of 5 minutes

SOIL MIX

1. Use a good potting soil

1. You may want to add some perlite if the potting soil does not contain any

2. Dampen the soil – can squeeze into a ball, but cannot squeeze water out

Planting Seeds!

CHOOSE CLEAN CONTAINERS

CHOOSE GOOD SOIL

LABEL WITH PLANT NAME AND DATE PLANTED

STARTING SEEDS

- Timing important
- Containers
- Sanitation
- Light
- Media / soil
- Bottom heat
- Watering
- Air Circulation
- Humidity
- Temperature
- Fertilizing

PLANTING CONTAINERS

- New
- Recycled
- Plastic
- Clay/ceramic

GERMINATING SEEDS UNDER PLASTIC

Under Lights

HEAT

HEATING MAT

HOT WATER AS BOTTOM HEAT

WATERING

- Keep top of soil moist with plastic or newspaper covering until seeds germinate
- Room temperature water
- Fertilize after bumping up or Transplanting

WATERING SEEDS


ITS SPRING
WE ARE SO EXCITED
WE WET
OUR PLANTS

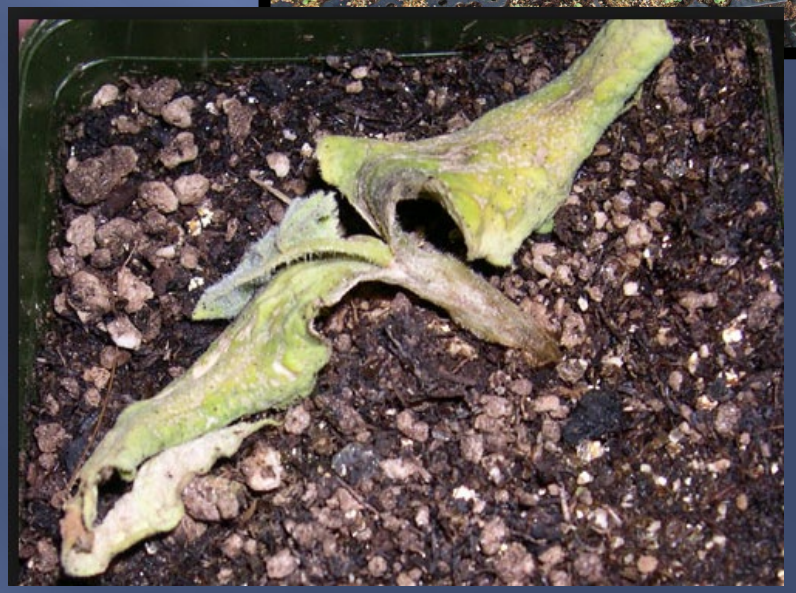
DAMPING OFF DISEASES

Most Prevalent in Wet and Cool Conditions

- **Attack below or above soil surface**

PREVENT BY:

- **Sanitation of pots & soil**
- **Drier Conditions**
- **Better Air Circulation**
- **Drench soil with Anti-fungal**
- **Thin Seedlings**



TRANSPLANTING SEEDLINGS

TRANSPLANTING SEEDLINGS p 1 of 2

- As soon as the seedlings are large enough to handle easily, they should be transplanted.

- The smaller plants are much easier to handle and generally recover quicker from the shock of transplanting.

- It is important to note that the seedlings should always be handled by one of the leaves.
  - ✓ If something happens to damage a leaf, the plant will usually survive.
  - ✓ If the main stem is bruised or damaged it can affect the growth of the plant for life.

- Loosen the soil around the seedling using your dibble.

TRANSPLANTING SEEDLINGS p 2 of 2

- Carefully lift the plant out of the community pot trying to avoid any more root damage than is absolutely necessary. Hold onto a leaf.

- Once the plant has been removed it should be planted as quickly as possible into its new location.
  - ✓ Try to work quickly.
  - ✓ If the root system dries out for even a short period of time, it can result in root death.

- It is important to plant the seedling at or near the same height it was growing in the community pot.
  - ✓ Some plants such as tomatoes (and others) benefit from being planted deep.

PROPER METHOD FOR HANDLING SEEDLINGS

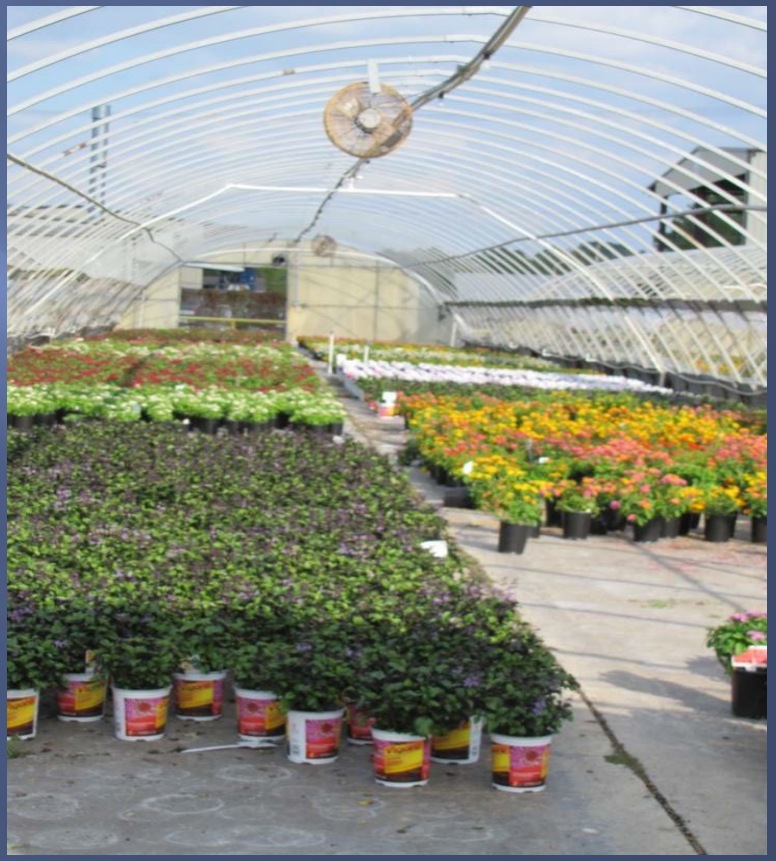
Hold Them By The Leaf, Never The Stem

REMEMBER:

If the main stem is bruised or damaged, it can affect the growth of the plant for life.

HARDENING OFF

- Acclimate Plants to Planting Site



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