University of California
Cooperative Extension

El Dorado County Master Gardeners Present

Plant Propagation

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Thank you to….

Today's Hosts!

Thank you to….

More Hosts!

Handout Prepared by:

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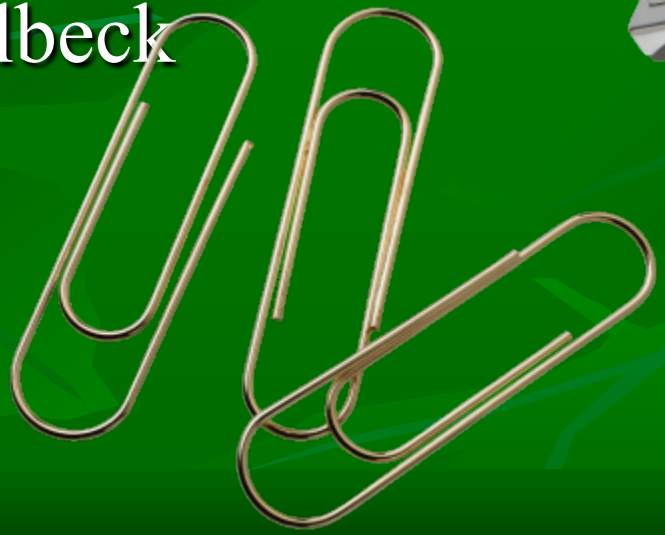
- Virginia Feagans
- Debbie Hillel
- Gail Fulbeck



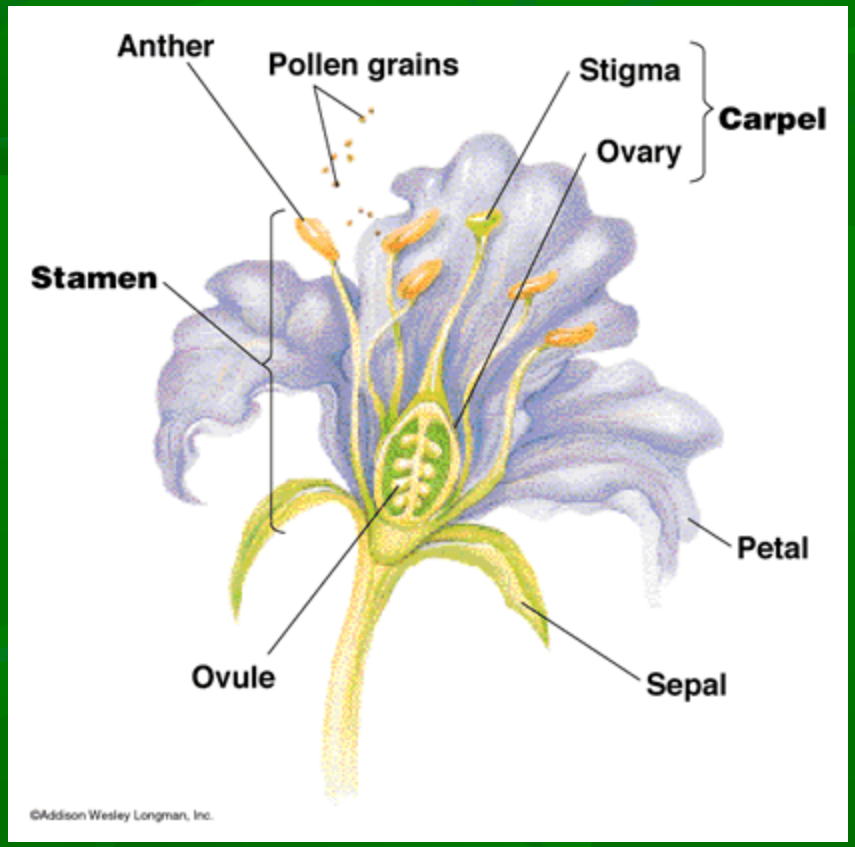
Why Propagate by Seed?

- Make more plants
- Establish/maintain desirable characteristics
- Keep established plants healthy
- Perpetuate a species
- Perpetuate memories!

Introduction

- Plant propagation is the process of increasing the number of a given species
- Two types: sexual & asexual

Sexual Reproduction



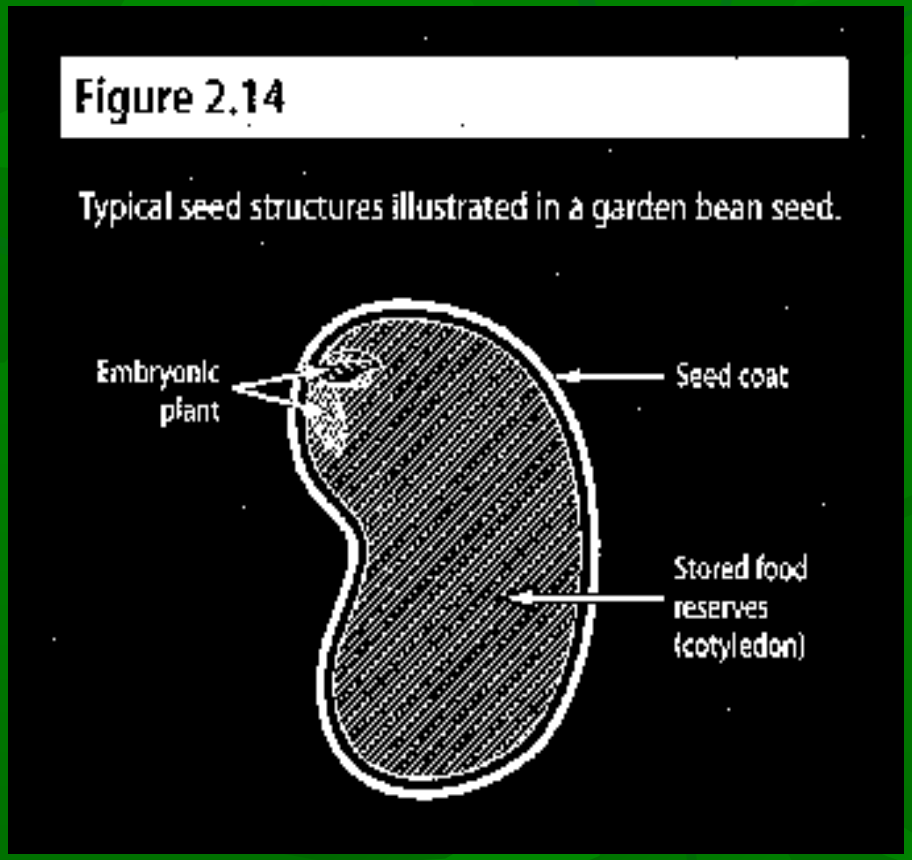
- Union of the sperm (located in pollen grains) with the egg (located in the ovary & ovules)
- Use of viable seeds to produce new plants
- Adults only!
  - Juveniles incapable of flowering..

The Botany of Propagation

- It is not essential to learn about botany to garden well:
- It’s inevitable.
  - -Ken Druse
    - Making More Plants: The Science, Art, and Joy of Propagation

Seed Physiology

- 3 parts:
  - Outer seed coat (protection)
  - Endosperm (food reserves)
  - Embryo (developing young plant in relatively dormant state)



How to Succeed with Seeds

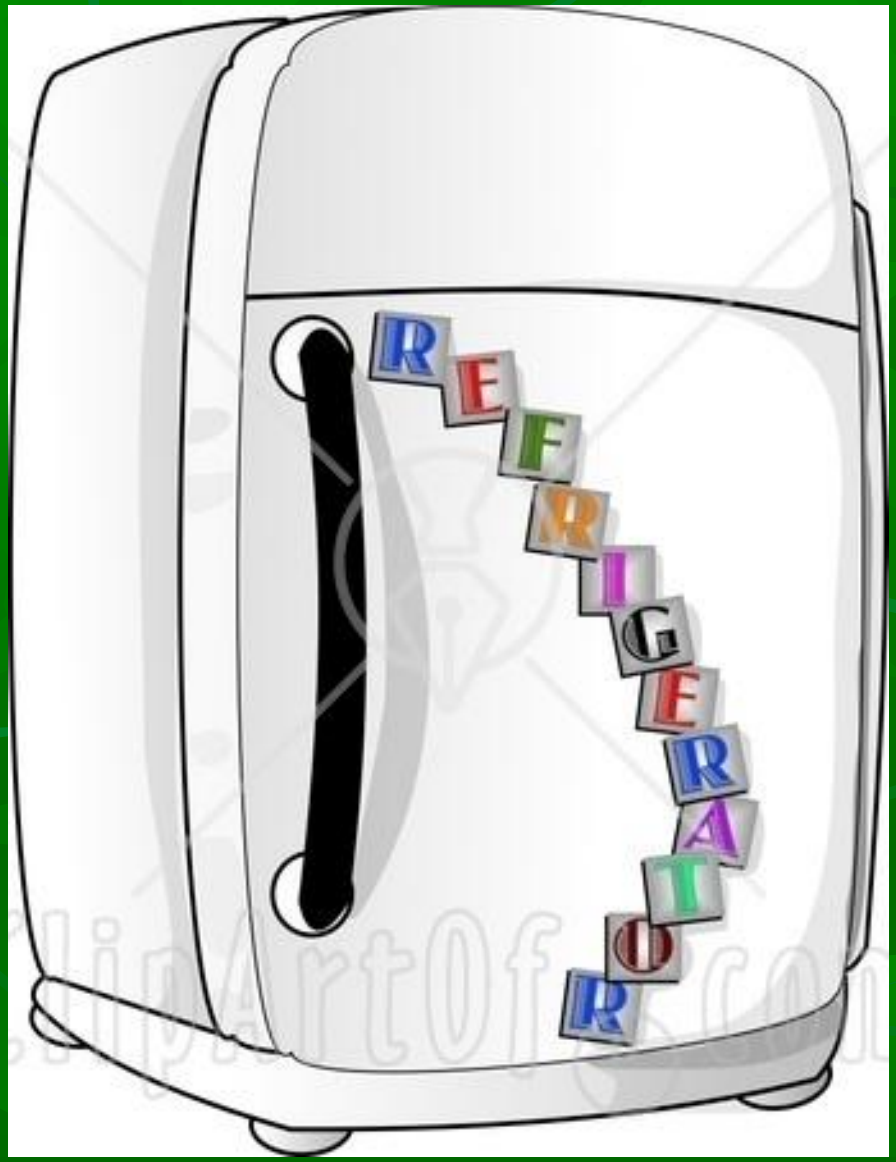
- Start with high quality seeds
  - From a reliable dealer
  - Choose varieties adapted to our area
  - Fresh --Buy enough for current year only

Decisions, Decisions….

- Hybrid vs open-pollinated (non-hybrid)
  - More uniform plants
  - Better productivity
  - Unique characteristics such as resistance to specific diseases (VFN, etc)
  - Disadvantage: More expensive
  - Disadvantage: Seeds collected from hybrid plants will not breed true

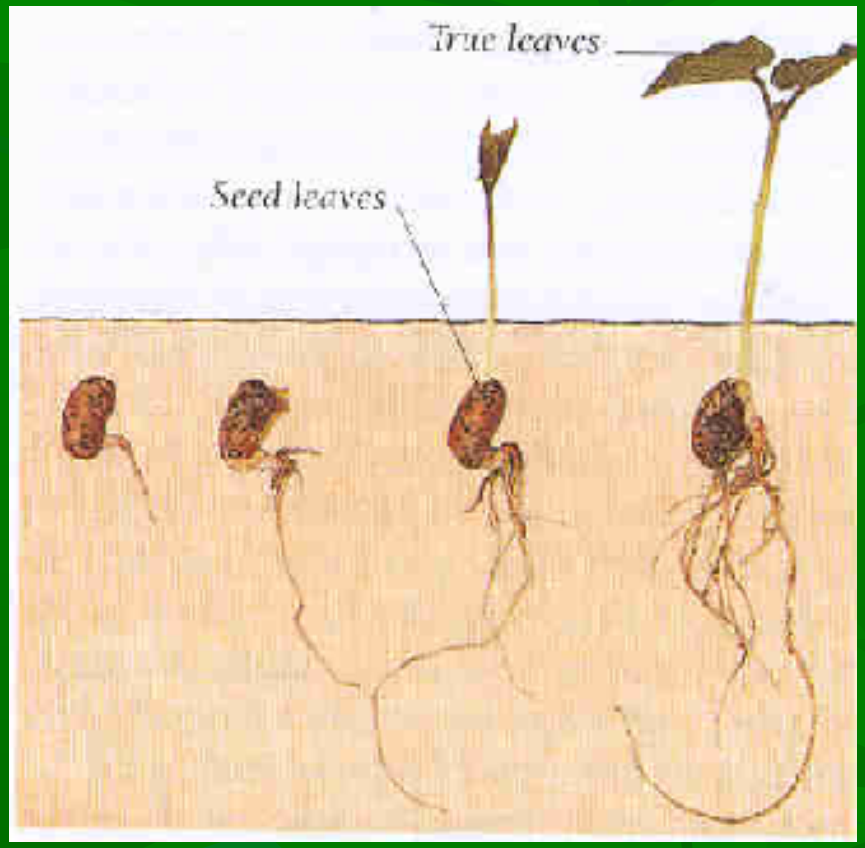
Seed Storage

- Foil packets
- Paper packets stored in tightly-closed jars
- Cool - 40 degrees
- Dark, dry
- Refrigerator is good
- Label & date

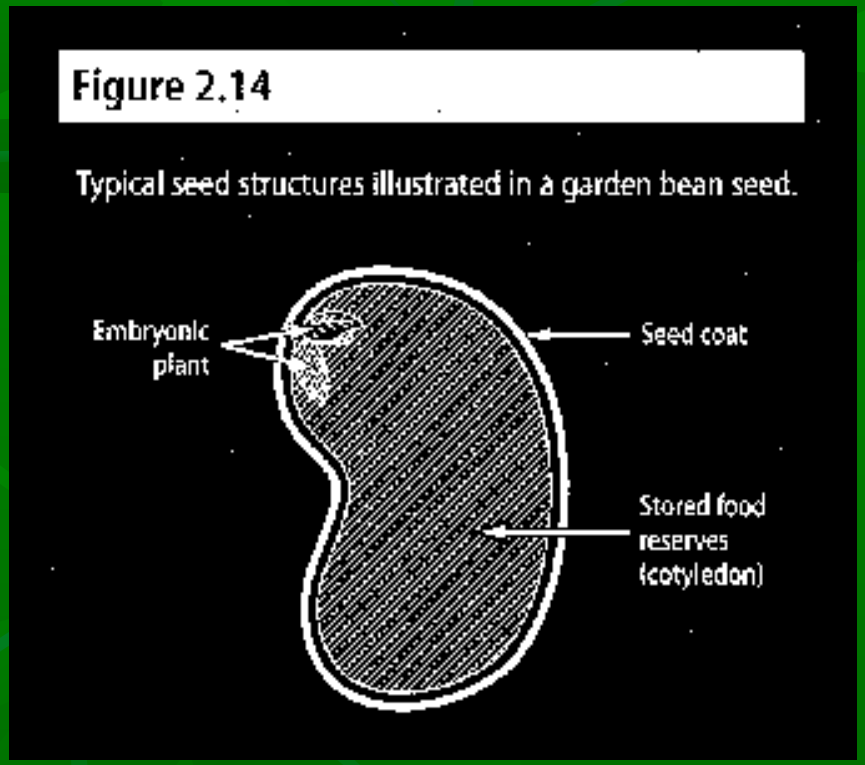

REFRIGERATOR

Germination Requirements

- Termination of dormancy
  - Scarification
  - Stratification
  - Hormones
- Satisfactory environmental conditions
  - Water
  - Air
  - Light (some seeds)
  - Temperature
- Support – during
- Nutrients - after



Seeds (déjà vu)



- 3 parts:
  - Outer seed coat (protection)
  - Endosperm (food reserves)
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Germinating Media

- Sterile! (--or not?)
- Fine, uniform texture
- Loose, well aerated
- Insect/disease/weed-free
- Holds moisture & oxygen
- Drains well
- If in doubt, buy a quality seed starting mix

Containers

- Re-use & recycle!

Sterilization

- Soak container in water
- Remove all dirt & debris
- Immerse in 10% solution of household bleach 1 minute
- Rinse w/clean water
- Let dry
- Dispose of bleach responsibly

Fill your Container

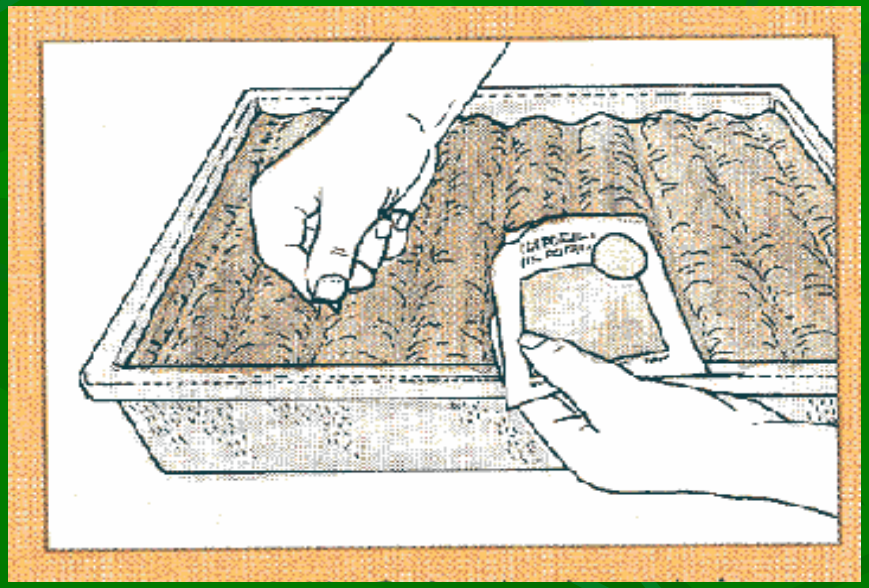
- Moisten your medium
- Fill container to just below rim
- Lightly tamp medium to provide uniform flat surface

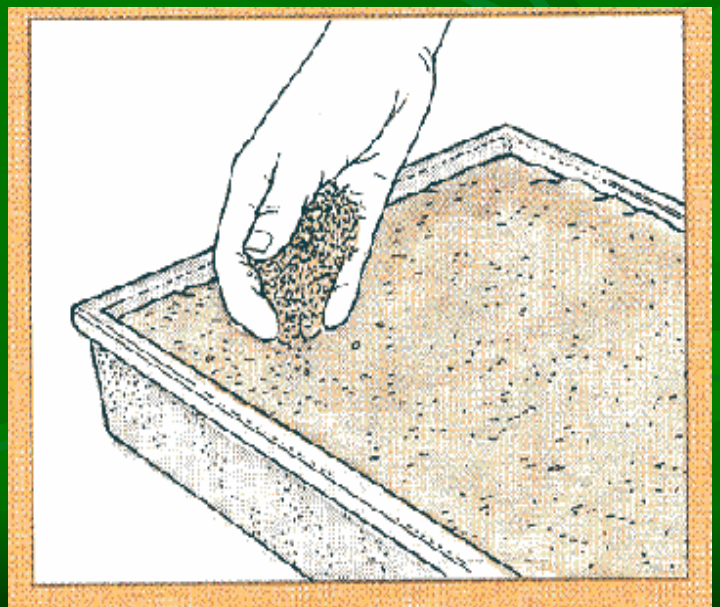
makeover.about.com

backyardnature.net

Sowing Seeds

- Medium to large seed: make furrows in rows 1 to 2” apart
  - Sow thinly & uniformly
  - For 6-packs, use dibble
- Tiny seed: Broadcast uniformly, half in each direction
  - Lightly press into planting medium or water in with fine mist spray
- Gently sprinkle a thin layer of dry vermiculite over seed. (Use a flour sifter!)





Gel, Baby

- Soak & drain seeds, keep moist & warm until germinated.
- Make a gel: 1 T per cup water, stir constantly over heat, boil 1 minute. Cool thoroughly & place in a plastic bag.
- Add germinated seed, snip a hole in bottom, and squeeze gel through the hole along your garden row
- The gel keeps germinating seeds moist until they establish themselves in the garden soil

Watering

- After sowing, moisten planting mix thoroughly
  - Fine mist OR
  - Place in 1-2” of warm water
- Once saturated, let drain
- Maintain moisture & humidity throughout germination
  - Low-pressure misting system
    - 1-10 seconds every 15 -60 minutes
- OR:
  - Keep out of direct sunlight
  - Cover w/glass or plastic
- Set the container in a warm place
- Remove cover when first seedlings appear
- Regularly feed w/ half-strength water soluble fertilizer

Temperature

- Best germination temperature 65º - 80º
  - Soil heating cable
  - Heat mat
  - Waterbed heater?

amazon.com

freeplants.com

Exceptions:

- Skip flats & sow directly into the ground or into individual containers
  - Corn
    - (can soak first to speed germination)
  - Beans, peas
    - Can pre-sprout to decrease likelihood of rot
  - Carrots
    - Inter-plant w/radishes
  - Squash, cucumbers, melons
  - Potatoes

Care of Seedlings

- After germination move containers to bright airy location
  - 55 to 60 degrees at night
  - 65 to 70 degrees during the day
- If insufficient light is available, supplement w/ fluorescents
  - 6” above seedlings
  - 16 hours per day
- Keep soil evenly moist, do not allow to dry out

Transplanting

- Minimize setback by transplanting before plants outgrow their container or flat
  - Shortly after appearance of first true leaves
- Carefully dig & lift with knife or plant label: called "pricking out"
- Handle by leaves, not by stem
- Avoid tearing roots. If necessary, cut roots cleanly

Transplanting

- Make holes 1 to 2” apart in transplant medium to same depth as seedling was growing in flat
- Carefully insert seedlings

Care of Transplants

- Keep away from sun & direct heat sources for a few days
- Keep soil evenly moist, do not allow to dry out

Time to go Outside!

- But we're so tender….

What is Hardening Off?

- Process of slowing plant growth to withstand changes in environmental conditions that occur when plants are transferred from a greenhouse or other protected environment to the garden
- Critical with early crops when adverse climatic conditions can be expected
- Gradual lowering of temp & relative humidity, gradual reduction of water result in thickening of cell walls
- Soft, succulent growth becomes firmer & harder

How to Harden Plants

- Start at least 2 weeks prior to planting in garden
- Move plants to shady location approx 45 to 50 degrees (cold frame!)
- Move plants gradually into sunlight, increasing the length of exposure each day
- Reduce frequency of watering but do not allow plants to wilt
- Protect from wind & temps below 45
- Plant outside after 2 weeks

When is the Soil Warm Enough?

Which are the Warm Season Veggies?

- Cucurbits
  - Squash, cucumbers, melons
- Corn
- Beans
- Peppers, eggplants

How can I warm my soil?

- Bury active compost or manure 1 foot under bed
- Pull mulch away & allow direct sunshine onto soil
- Clear plastic stretched over soil
- Greenhouse cover
  - Can be as simple as plastic stretched over sticks & weighted at edges

Questions so far

Seed Saving

- Why
- Consideration
- Easy/Difficult
- Procedures
  - Mature and dry
  - Temperature
- Storage
  - Mason jar
  - Heavy ziplock
- How long can I store

Questions?

El Dorado County Master Gardeners

T-F 9:00 AM – 12:00 noon 530-621-5512

http://ucce.ucdavis.edu/counties/ceeldorado/Master_Gardener

References

- California Master Gardener Handbook
  - Dennis R. Pittenger, Editor
- Sunset Western Garden Book
  - Kathleen Norris Brenzel, Editor
- Propagation Handbook
  - Geoff Bryant
- American Horticulture Society Plant Propagation
  - Alan Toogood, Editor-in-Chief
- Making More Plants
  - Ken Druse

Thank You!

- Ingrid Bergman
- Climbing Peace
- Dr. Huey (rootstock)
- Penstemon
- Red Globe grape
- Louisiana iris
- Begonia