## Intro

Welcome and @ master gardener program

* The UC Master Gardener Program is a public service and outreach program under the  [Division of Agriculture and Natural Resources](http://ucanr.edu/). Non-profit collaboration UC research-based information about home horticulture and pest management to the public.
  + All volunteer, depend on you for funding but mission is to educate. MGs raise your hands
  + Look for a survey after this class – will help funding at the state level
  + Display raffle prize

## What you’ll learn

* Who – sources for interesting seeds see handout
* What – what to plant now for fall and winter harvest
* Where – sow direct or container sow and transplant
* Why – why planting from seed is important & desirable
* When – see planting guide

## Why start from seed?

* Inexpensive (seed vs. seedling)
* Thousands of varieties to choose from
* Some plants need to be sown direct, some do better started indoors
* Save seed, preserve genetic diversity
* Fun, creative, rewarding, magical. Growing seeds is good for the soul, renewal in action
* *“I think that any time of great pain is a time of transformation, a fertile time to plant new seeds.”*  Debbie Ford

## Seed Biology

### Seedling Anatomy

***Demonstration: See Diagram***

### Seed types

***Demonstration: Look at seed packets (quiz)***

* **Hybrid(F1)** – Plant cross using a controlled method of pollination in which the pollen of two different species or varieties is crossed by human intervention. WILL NOT breed true in second generation
* **Open pollinated (OP)** - is when pollination occurs by insect, bird, wind, humans, or other natural mechanisms. WILL breed true, ok to save seed in most cases.
* **GMO or GE** – not to worry, not available to home gardeners

### Seed sources – See seed source handout,

### Timing is everything – *See planting guide handout*

Fall crops to plant now

* Seeds in the ground and in container
* Tubers and Roots
* Bulbs
* Perennials

When –

* planning, days to germ and days to maturity
* Daytime temp under 70 degrees as plants mature, ideally soil and air temp between 40-50 degrees as they mature – plant in cool soil, no warming pads
* Weather in fall can be, hot and cold, wet and dry
* Solar exposure after the equinox
* Where – container sow, direct sow

#### Direct sow

* Seeds with a taproot: carrots, radish, turnips, beets, spinach
* Large, defensible seeds or self sowers: peas, chard, cilantro, alyssum,
* Plants that just don’t like to be transplanted: wildflowers, poppies
* Tubers, bulbs and bare root

#### Container sow

* More control, more work
* Every transplant slows down the seedling

## Equipment *(review equipment table)*

* Containers- cottage cheese, yogurt and milk cartons, tp tube, etc.
* Sieve – optional for covering fine seeds
* Sharp sand – for mixing with very fine seed
* Greenhouse – floating row over a baking rack with clothespins, milk jug
* Plant stakes – venetian blinds
* Watering – water bottle with water holes burned in lid
* Floating row cover – protect from frost and flying pests
* Green house cover for trays
* Chopstick – to poke holes in soil, help lift roots gently
* Bleach solution – rinse containers to prevent fungal disease
* Seed planting dispenser – doles out seeds one at a time
* Hoop house – not too hard to do with PVC and a post
* *For spring seed starting only* Heat mat – top of the fridge
* *For spring seed starting* Grow Light – florescent bulb hanging from chains

## Seed Starting Soil

The big debate: soiless or soil mixes? What’s your risk level?

### Typical Ingredients *(Look at soil ingredient demonstration)*

* Peat moss – acidic and not sustainably harvested
* Coir – a great alternative to peat (aka coco or coco peet)
* Compost – home grown or bagged
* Worm castings – provides some nutrition
* Vermiculite – naturally occurring mineral, retains water
* Perlite – processed volcanic material that lightens soil and improves drainage
* Pumice is a more sustainable alternative to perlite
* Rice Hulls – lightens the mix
* Bagged potting soil
* Garden soil – not recommended
* OR buy a bag of seed starting mix!

|  |  |
| --- | --- |
| **Soilless** | **Soil based** |
| Seeds don’t need nutrition if you plant out on time. If you’re late, they may suffer nitrogen stress | Gives you a little more leeway on planting out by providing some nutrition |
| Don’t harbor weed seeds | May introduce weeds |
| Less likely to introduce fungal disease | May introduce fungal disease like “damping off” |
| Good drainage | May have slower drainage |
| Poor water retention (depending) | May hold water better |
| Light and fluffy | May compact or crust over |

**Make Soil**

***>>> Exercise – break into 3 groups, measure & mix soils in buckets, water to moisten.***

#### Recipe 1

* 8 parts (pre-moistened) [coco coir](https://www.amazon.com/gp/product/B00DQ4P70A/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B00DQ4P70A&linkCode=as2&tag=getbusgar07-20&linkId=WQD3WG67JR647QVA) or [peat moss](https://www.amazon.com/Espoma-PTM8-8-Quart-Organic-Peat/dp/B0037AP20I/ref=as_li_ss_tl?ie=UTF8&qid=1487891033&sr=8-3&keywords=peat+moss&linkCode=ll1&tag=getbusgar07-20&linkId=ee7fd9a3d92fc2c48a0870f620ebf526)
* 1 part [vermiculite](https://www.amazon.com/gp/product/B002Y06KTE/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B002Y06KTE&linkCode=as2&tag=getbusgar07-20&linkId=K5JGAJTO3V5G2PR3)
* 1 part [perlite](https://www.amazon.com/gp/product/B002Y0AK6S/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B002Y0AK6S&linkCode=as2&tag=getbusgar07-20&linkId=V4TC5GXJMA4EAFY3) or [pumice](https://www.amazon.com/Bonsai-Orchid-Pumice-Gallon-~6LBS/dp/B00H301KOU/ref=as_li_ss_tl?ie=UTF8&dpID=61wbp7kkqGL&dpSrc=sims&preST=_AC_UL160_SR160,160_&psc=1&refRID=1CB3QVQ10MD96R6QXASJ&linkCode=ll1&tag=getbusgar07-20&linkId=4e091602145f6ca7f46f78b345da8d6b)
* 1/4 tsp [garden lime](https://www.amazon.com/Burpee-97070-Granular-Garden-Lime/dp/B0791B4F6F/ref=as_li_ss_tl?s=lawn-garden&ie=UTF8&qid=1518633198&sr=1-9&keywords=garden+lime&linkCode=ll1&tag=getbusgar07-20&linkId=00de070a423b84e640033856ce6d7a4e) per gallon (if you use peat moss)

#### Recipe 2

* 7 parts parts coir
* 2 parts rice hulls
* 1 part compost   
  optional: a tablespoon of feather or fish meal

#### Recipe 3

* purchased seed starting mix
* Contains peat moss, lime, perlite

### Sterilization (what’s your risk tolerance level?)

Mix the proportion well before sterilization and make it evenly moist (especially when you are using peat moss). This happens best when the soil is kept in a discarded oven (45 minutes at 150 ° C) or in a microwave oven (10 minutes at 800 watts). This will make your soil disease free.

## Seed starting process : plant, germinate, prick out, transplant

**1. Plant seeds   
>>> *Exercise: rinse containers in bleach solution, fill with soil mix, pick out seeds, write a label, plant a few seeds to take home and water gently***

* rule of thumb, sow seeds in a 3-4” container – depth: 2-3 times deep as seed is wide
* If planting in cell packs, plant 2 seeds per cell
* Soil temp: 40-70 degrees for most fall crops
* Exceptions: need light, need scarification or stratification
  + Nick, file, soak or chill
  + Examples: morning glory like seed coat nicked, spinach likes a few days in the fridge before planting
  + Read the seed packet

***>>> Demonstration:* Planting carrots (mix with sand, scatter in larger pot to simulate outdoor planting and water. Cover with newspaper & moisten.**

**2. Pricking out**

***>>> Exercise:* Prepare a new single pot or 6 pack, fill with soil, prick out and plant with chopstick. Water gently.**

* Prick out when 1-2 pairs of true leaves appear
* Handle by leaf, not by stem or roots
* When planting, don’t bury the cotyledons
* Transplant to cell pack, single pots or large flat
* When to plant in the ground (size)

**3. Transplant into ground**

***>>> Demonstration:* Show examples of transplants in different sizes. Right size to plant out or choose from garden center.**

## Specific tips & tricks

* Add sand to small seeds to broadcast
* Paper over carrot planting
* Breaking dormancy – spinach in wet paper towel in fridge for 2-3 days
* Cut and come again greens – so easy! Great for containers
* Cover crops – plant in Nov, best thing you can do for your soil
* Kale can take frost, very cold hardy
* Cool weather makes red leafy greens redder
* Some seeds require light to germinate (read packet)
* DO NOT use bottom heat to germinate cool season crops
* Label your plantings AS YOU GO

## Hardening off

Before you plant your mature seedlings in the garden, leave them outside for 7 – 10 days and nights that seedlings become accustomed to strong sunlight, cool nights and less-frequent watering.

## What could go wrong?

* Predators – birds, slugs, snails, earwigs, loopers and cabbage worm
* Too hot – Indian summer
* Soil temp under 70 degrees for most cool crops
* Too cold – use row covers for frost
* Slow growing
* Disease – soil fungus, mildew – damping off
* Stay too long in the pot
* Microclimates and macroclimate

## Not seeds but plant soon

* Garlic in Nov
* Transplant perennials
* Woody Mediterranean herbs
* Flower Bulbs
* Bare root plants: Jan
  + Fruit trees
  + Berries
  + Rhubarb
  + Asparagus

## Storing seeds

* Store in jar or ziplock bag that is air and water tight. Keep cool.
* Let come to room temp before opening jar lid if kept in fridge.

## Close

* Questions
* Upcoming classes
* Raffle
* Close