Seed saving

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Why save seeds?

- To save money
- To keep varieties that you enjoy
- To preserve genetics from plants uniquely adapted to your garden
- To indulge your inner science nerd

Growing mold on tomato seeds

Definitions

- Open-pollinated – plants produced by crossing two parents of the same variety, which produce offspring like the parent plants, inbred
- Hybrid – the offspring of a cross between parent varieties that are genetically different
- Heirloom – an open-pollinated variety that has been in existence for several generations or at least 50 years

Most lettuces are open-pollinated varieties

Most sweet corn varieties are hybrids

Examples of heirloom tomatoes

Start with open-pollinated varieties

- Only seed saved from open-pollinated (OP) varieties, bred in isolation, will produce seed true to the variety
  - Don't save seed from hybrid varieties
- Buy seed packets of OP varieties from a trusted source
  - Varieties can be heirloom, but it isn't a requirement
    - Ex., gold nugget cherry tomato, OP, bred in 1980s

Save seeds from the best plants

- Select the best plants
  - Let them mature instead of using them for food
  - Mark the chosen individuals by tying strings to them
- Plant characteristics to consider
  - Earliness, disease resistance, stockiness, uniformity, trueness-to-type
- Fruit characteristics to consider
  - Color, shape, size, thickness of flesh productivity, storability, flavor, etc.

Maintaining variety purity

Rouging lettuce

- When saving seed it is necessary to remove off-type plants from your garden
  - Some off-type plants may not be evident until the fruit forms (e.g., squash, beans, etc.)

Vegetables & herbs for beginning savers

- Arugula
- Basil
- Coriander
- Dill
- Eggplant
- Green beans & peas
- Ground cherries
- Lettuce
- Peppers
- Tomatoes
- Cucurbits – cucumbers, melons, pumpkins, squashes, watermelon

Arugula – *Eruca sativa*

- Cultivation
  - Requires insects for pollination
  - Will only cross with other arugula varieties
  - Some outer leaves may be harvested without affecting seed production
  - Select plants that are slow to bolt
- Harvest
  - Seed pods will not ripen uniformly but will shatter with time
    - Several hand pickings will result in the greatest harvest
    - Or cut the entire stalk when the greatest number of pods are dry but not shattered
- Allow to dry and store in a cool, dark, dry location

Basil – *Ocimum basilicum*

- Cultivation
  - Requires insects for pollination
  - Will cross with other basil varieties, plant varieties 150 ft. apart
- Harvest
  - When the bottom seed capsules start to brown, cut the stem and allow to dry in a well-ventilated area
  - Rub the stem to remove the seed and chaff
  - Place chaff and seed in bowl, swirl bowl
  - Seeds will collect at bottom
  - Tip bowl to rake off chaff
  - Blow carefully over bowl to remove remaining chaff
- Store in a dark, dry cool place

Coriander, Cilantro – *Coriandrum sativum*

- Cultivation
  - Will not cross with any other vegetable or herb
  - Plant will bolt quickly in hot weather
- Seed harvest
  - Allow the seeds to dry in the garden
  - Collect in a paper bag
- Store seed in a cool dry, dark location

Dill – *Anethum graveolens*

- Cultivation
  - Dill will only cross with other varieties of dill
- Seed harvest
  - Allow the seeds to dry in the garden
  - Seeds shatter easily from heads during cleaning
  - Clip a head of dry seed and gently rub seeds into a paper bag
- Store seed in a cool dry, dark location

Eggplant – *Solanum melongena*

- Cultivation
  - Self-pollinating
  - Insects will cross varieties of eggplant
  - Grow only one variety, use a 50’ separation distance, or cover caged plants with spun polyester
- Harvest
  - Several fruits can be harvested for eating before fruit saved for seed are allowed to mature
  - Let fruits grow past the edible stage
    - Purple fruits will turn a dull purplish brown
    - Green fruits will turn yellowish green
    - White fruits turn golden

Eggplant (cont.)

- Seed cleaning
  - Scrape seeds from fruit or try the following:
  - Grate or blend the bottom portion of an eggplant using a hand grater or food processor
    - Dump all gratings into a bucket or bowl
    - Add water equal to the volume of the gratings
    - Reach into the bucket and squeeze the gratings to free the seeds
    - Good seeds will sink to the bottom
    - Pour off the pulp
    - Strain the seeds
    - Dump seeds onto a glass or ceramic plate
- Store in an airtight container in a cool, dry, dark location

Green beans – *Phaseolus vulgaris* & peas – *Pisum sativum*

- Self-pollinating
  - Generally crossing of varieties is not a concern
  - However, insects may cross-pollinate legume
    - Especially if other pollen sources are scarce
    - Also the larger the flower, the most likely a bee will visit
  - So if multiple varieties of either peas or beans are grown, avoid planting varieties next to each other

Green beans & peas (cont.)

- Harvest
  - Save seed from healthy plants that appear true-to-type and bear heavily
  - Leave pods on plant to dry
  - Split pods by hand or fill a feed sack or pillow case with seed pods, tie the opening shut, and jog in place on top of it to remove seeds
- Storage
  - To check for dryness, hit with hammer, if it shatters it's ready
  - When dry, freeze seeds to kill weevil eggs that may be present on seeds

Ground cherries – *Physalis pubescens*

- Cultivation
  - Flowers are self-pollinating
  - May cross with other species of Physalis genus (Chinese lantern, purple ground cherry)
- Harvest seeds
  - Select ripe fruits from as many different plants as possible
  - Remove husks and place cherries in blender, add water, stir vigorously
  - Dump of floating pulp and hollow seeds
  - Repeat until only seeds and clean water remain
  - Pour seeds into a strainer
  - Dump seeds onto a glass or ceramic plate to dry
- Store in a cool, dry place

Lettuce – *Lactuca sativa*

- Cultivation
  - Separate varieties by at least 12 feet
  - Flowers will self-pollinate
- Selection
  - A few lettuce leaves may be harvested without affecting quality or quantity of seed
  - Slow-bolting lettuces should be saved for seed rather than be harvested
- Harvest
  - Seeds ripen 12-24 days after booming
  - Either shake seed head into paper bag daily to collect seeds as they ripen
  - Or harvest the seed head when most of the seeds are ripe

Lettuce (cont.)

- Storage
  - Clean the seeds by using a fine mesh screen that allows seeds through but retains the “feathers”
  - Seeds are dry enough for storage when the break rather than bend when under stress

Sweet & chili peppers – *Capsicum annuum*

- Self-pollinating, but susceptible to crossing
  - Plant varieties are more than 500 feet apart;
  - Cage individual plants or varieties under spun polyester; or,
  - Use spun polyester bags to cover blooms before they open

Spun polyester bag

Caged peppers in spun polyester

Peppers (cont.)

- Harvest when fruits are fully mature (colored)
- Remove seeds from pepper
  - Use knife to remove seeds from core; or
  - Place pepper in blender on low with water. Pour off pulp. Repeat until only mature seeds remain. Dry on ceramic plate.
- Storage
  - Seeds are dry when they break when folded

Tomatoes – *Lycopersicon lycopersicum*

- Self-pollinating
  - Most modern varieties cannot cross-pollinate
  - Potato-leafed varieties, beefsteaks, and currant tomatoes are susceptible to cross-pollination
  - If more than one potato leaf tomato (e.g., Brandywine) is grown, flowers need bagged
  - If a beefsteak produces a double fruit, do not save seed from it

Spun polyester bag

Double fruit beefsteak

Potato-leafed tomato

Tomatoes (cont.)

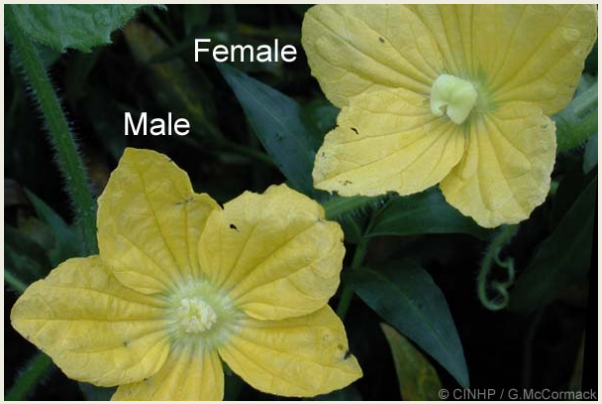
- Harvest
  - Pick and wash fully ripe tomatoes
  - Cut the fruit through the middle to expose the seed cavity
  - Squeeze the seeds and surrounding gel into a container
  - Add water (optional), it may make separating mold from seeds easier
- Allow gel to ferment for 1-3 days
  - Be cautious where you leave the bowl; it'll get funky
  - Each tomato seed is encased in a gelatinous sack that inhibits germination
  - Fermentation breaks down the germination inhibitor

Tomatoes (cont.)

- Clean the seed
  - Skim the mold off
  - Add water and stir. Pour pulp and immature seeds off.
  - Repeat
  - Use a strainer as necessary
  - Dry the seeds on a plate, stir to keep from clumping
- Store
  - Cool, dry area in an airtight container

Cucurbits

- This family includes melons, cucumbers, watermelon and squashes
- Each plant produces both male and female flowers
- All members are insect pollinated
- To save seed from cucurbits, you will need to
  - Grow only one variety from each species AND ensure that no other garden with ½ mile has a crop of the species you wish to save OR
  - Learn how to control pollination by hand pollinating



Hand pollination

1. In the evening tape closed male an female blossoms that are almost ready to open
   - Blossoms that are almost ready to open will show color along their seems and the tip will begin to break apart
   - Wilted flowers have already opened and cannot be used for pollination
2. In the morning after the dew has dried, pick the male flower.
   - Remove the tape and all the petals
3. Next, gently remove the tape from the female flower. It will slowly open
4. Gently rub pollen from the male flower onto each section of the stigma of the female flower
5. Retape the female flower
6. Tie a bright marker around the stem

Cucurbits (cont.)

- Hand pollination rates
  - Most successful early in the season because plants tend to abort fruit later in the season
  - Pollinating a female flower with multiple male flowers yields greater success
    - Typical success rates of hand pollination in cucurbits:
      - Watermelon: 50-75% successful
      - Melons: 15% successful
      - Cucumbers: 85% successful

Cucurbits (cont.)

- Harvest
  - Fruit must be grown to full maturity before harvest
    - Allow summer squashes to grown until large with hard rinds that cannot be dented by a fingernail
    - Allow cucumbers to soften and change to white or yellow or orange, depending on the variety
  - Let fruit sit for 3+ weeks after harvest to increase the number of viable seeds
- Clean and dry the seed
  - Separate the seed from the fruit using a strainer
  - Allow seeds to dry at room temperature
  - Seeds are sufficiently dry when the break when bent
  - Store in an airtight container in a dark, cool place

Cucurbits: Watermelon, melons, cucumbers

- There are many cucurbit species
  - Varieties within a species will cross
  - Varieties in different species will not cross
- A listing of varieties of melons & cukes by species:
  - *Citrullus lanatus*
    - Watermelon, citron
  - *Cucumis sativus*
    - Cucumbers
  - *Cucumis melo*
    - Muskmelon, cantaloupe, honeydew, Armenian cucumber

Citrullus lanatus

Cucumis sativus

Cucumis melo

Cucurbits: Squash, summer & winter

- There are several squash species
  - Varieties within a species will cross
  - Varieties in different species will not cross
- A listing of squash varieties by species:
  - *Cucurbita maxima*
    - All varieties of banana, buttercup, hubbard, and turban squashes; Amish pie pumpkin; Big Max
  - *Cucurbita mixta*
    - Most varieties of cushaw (green striped and white), wild Seroria squashes, silver seeded gourds
  - *Cucurbita moschata*
    - Butternut, cheese, golden cushaw
  - *Cucurbita pepo*
    - All varieties of acorn, crookneck, scallop, and spaghetti squashes; small striped and warted gourds; zucchini; many pumpkins

Cucurbita moschata

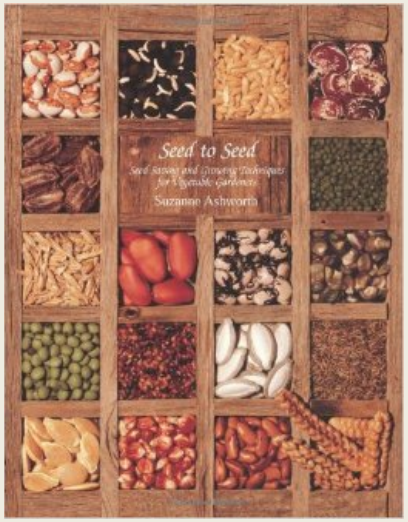
Cucurbita pepo

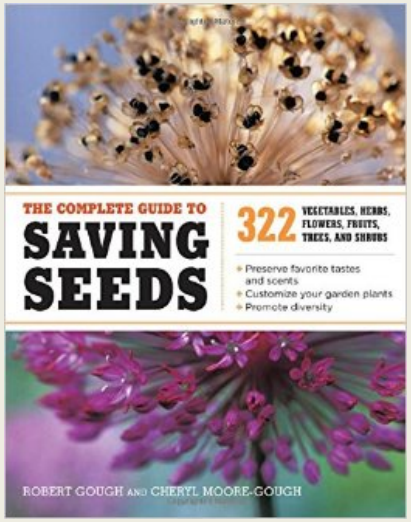
Cucurbita pepo

References & resources

Ashworth, Suzanne. Seed to Seed. 2002. Decorah, IA: Seed Savers Exchange. **Recommended**

Gough, Robert & Cheryl Moore-Gough. The Complete Guide to Saving Seeds. 2011. North Adams, MA: Storey Publishing.





Thank you!

Questions?