



WSU EXTENSION
Cowlitz County

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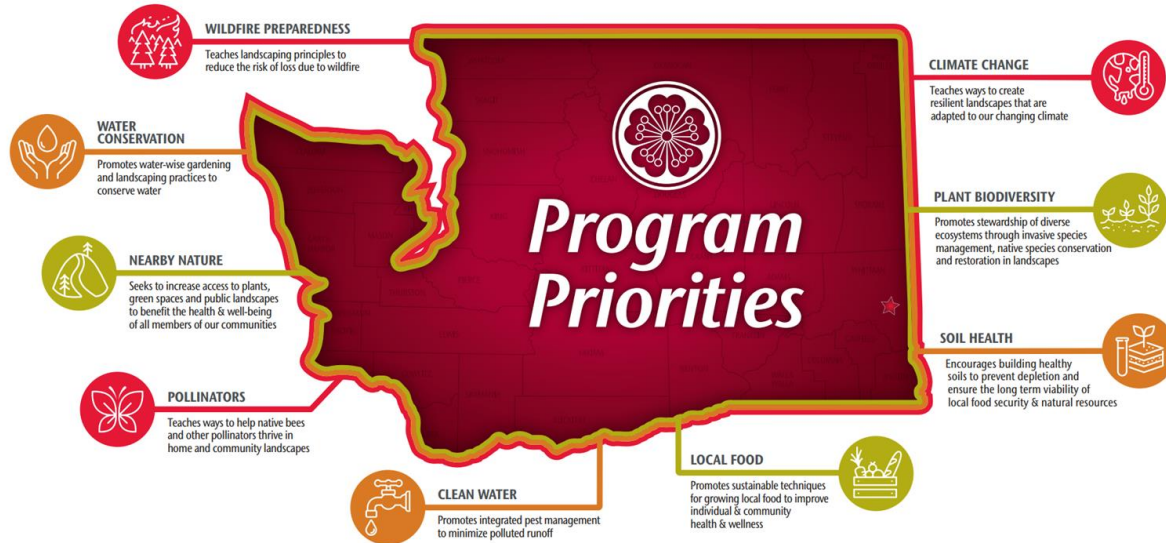




Become a Master Gardener

WSU Master Gardener Program

Cultivating Plants, People & Communities Since 1973



New Training
Class Starts Jan.
2023

Call Gary Fredricks
360-577-3014

garyf@wsu.edu

Become a volunteer mastergardener.wsu.edu



Master Gardener Program

WASHINGTON STATE UNIVERSITY
EXTENSION



Cowlitz County Master Gardeners



WSU Cowlitz Master Gardeners

cowlitzmastergardener@gmail.com

360-577-3014 Ext 1

WSU COWLITZ COUNTY EXTENSION

Master Gardeners



GARDENING AND PLANT PROBLEMS CLINIC



WSU EXTENSION
Cowlitz County



WHERE? Three ways to reach us!
360-577-3014 Ext.1
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Extension Office: 304 Cowlitz Way, Kelso, WA



WHEN? Email any time
Office: 10 am – 12pm Mar.-Oct.- MWF
Nov.-Feb.- Wed.

Send your photos. Bring your plant & insect specimens!



WSU EXTENSION
Cowlitz County

Saving seeds--Harvest



Visit our website
Tons of great gardening information
Recordings and slides from past workshops.
cowlitzcomg.com/workshops-videos



UPCOMING WORKSHOPS



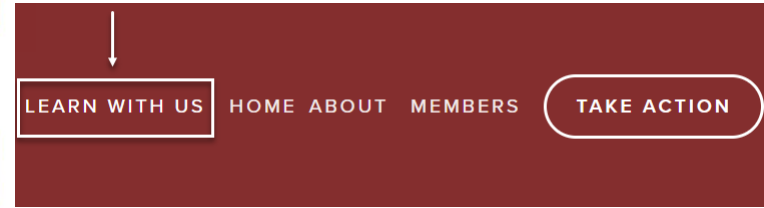
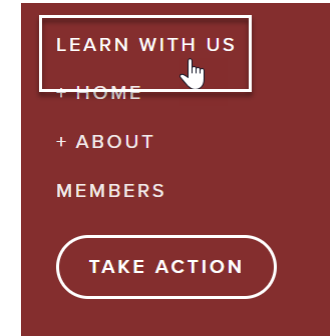
HAVE A GARDENING PROBLEM? ASK A MASTER GARDENER!



SUBSCRIBE TO OUR YOUTUBE CHANNEL-SEE WORKSHOPS YOU MISSED!



MONTH-BY-MONTH GARDEN TIPS



LANDSCAPE GARDENING



FRUITS



VEGETABLE GARDENING



LAWNS/TURF/PASTURE

Cowlitzcomg.com



COMPOSTING



POLLINATORS, SPIDERS, BENEFICIALS, INSECT PESTS



HOW-TO DEMONSTRATIONS- for adults and kids



WEEDS



Why save seeds?



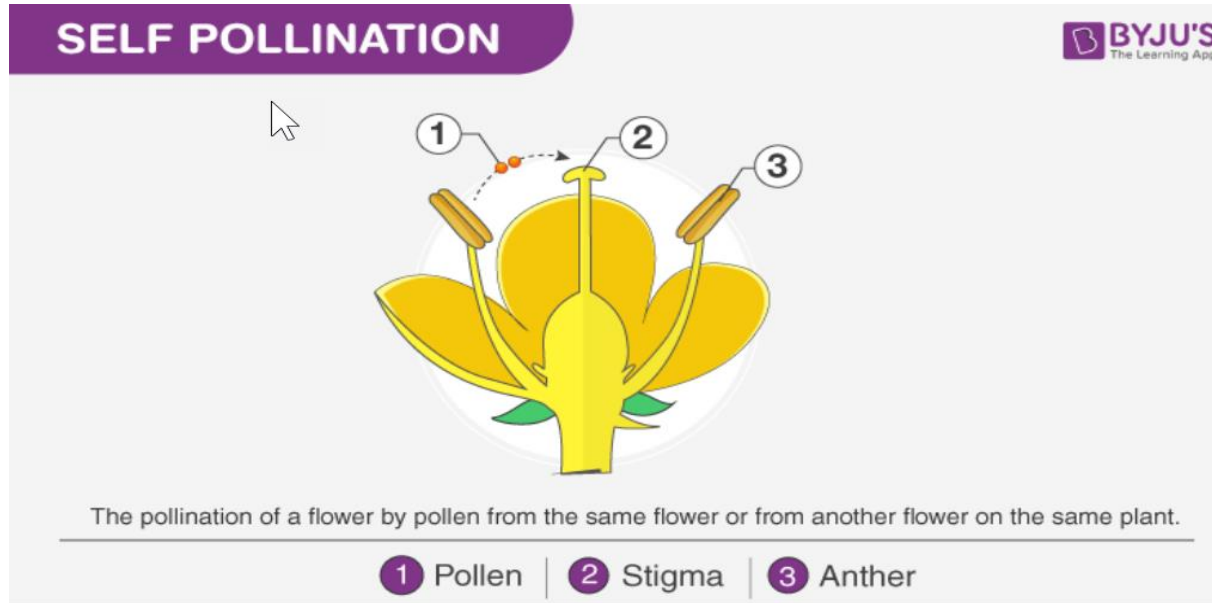
- It's FUN!
- It's ECONOMICAL!
- Grow stuff you can't buy in stores
- Grow best in OUR CLIMATE and SOIL

What we're going to talk about



- Review of concepts important to seed saving:
 - Flower types
 - Hybrids, heirlooms, open pollination
 - Annual and biennial plants
 - Self-pollination vs cross pollination
- Harvesting dry seeds
- Harvesting wet seeds
- Seed storage

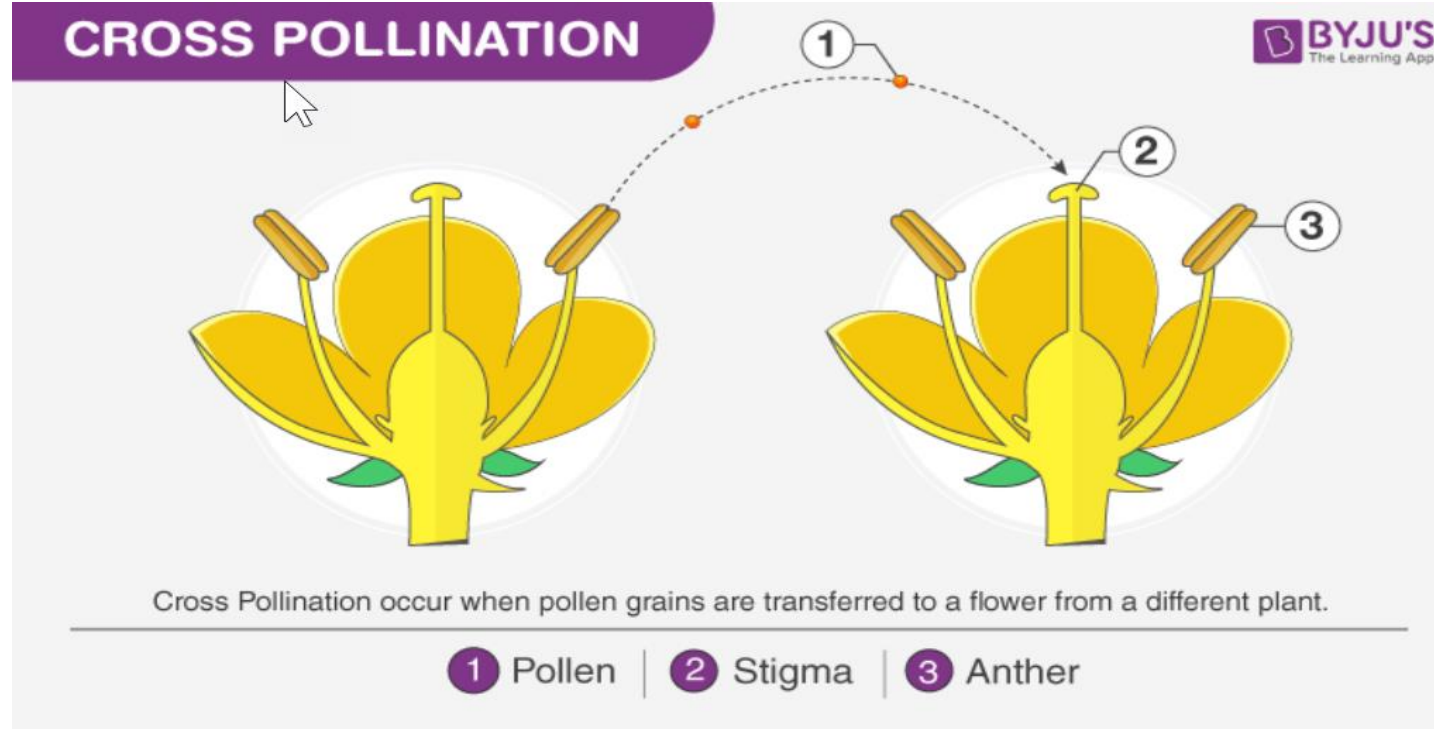
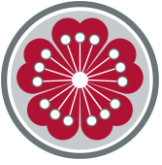
Seed terms—boring but important



<https://byjus.com/biology/difference-between-cross-pollination-and-self-pollination/>

- Only one plant needed for viable seeds!
- Male and Female parts on same flower or same plant

Seed terms—boring but important



<https://byjus.com/biology/difference-between-cross-pollination-and-self-pollination/>

- **Cross-pollination:** via wind or insects.

Boring but important



- **Open-pollination:** Any non-hybrid variety. Open pollination refers to seed produced without control of the pollen source
- All heirloom plants are open pollinated plants that have been stable, through many generations.
- If you plant seeds from an open pollinated plant, it will frequently breed “true,” be just like the parent plant (if self-pollinated or cross-pollinated by same variety)
- Tomatoes, beans, peas, and lettuce

Boring but important



- **Hybrids (F₁)** : Hybrids result from crossing between different varieties. The first generation (F₁) results from a cross of inbred lines. Seeds from a hybrid are often sterile and will not usually produce plants that resemble the hybrid (do NOT breed “true).
- **Cultivars**: Selections resulting from human intervention.
- **Varieties**: Naturally occurring selections within a species.



Hybrid: The result of cross-pollination between two varieties of the same genus and species.



Butternut + Cushaw = Hybrid

Cucurbits can only cross-pollinate within the same SPECIES



- *Cucurbita pepo*: Summer squash, gourds, acorn squash and pumpkin
- *Cucurbita moschata*: butternut squash
- *Curcurbita maxima*: Winter squash
- *Citrullus lanatus*: Watermelon
- *Cucumis melo*: Cantaloupe/ honeydew. Armenian cucumber are *Cucumis melo* (watermelon is a separate genus/species)
- *Cucumis sativus*: Cucumbers

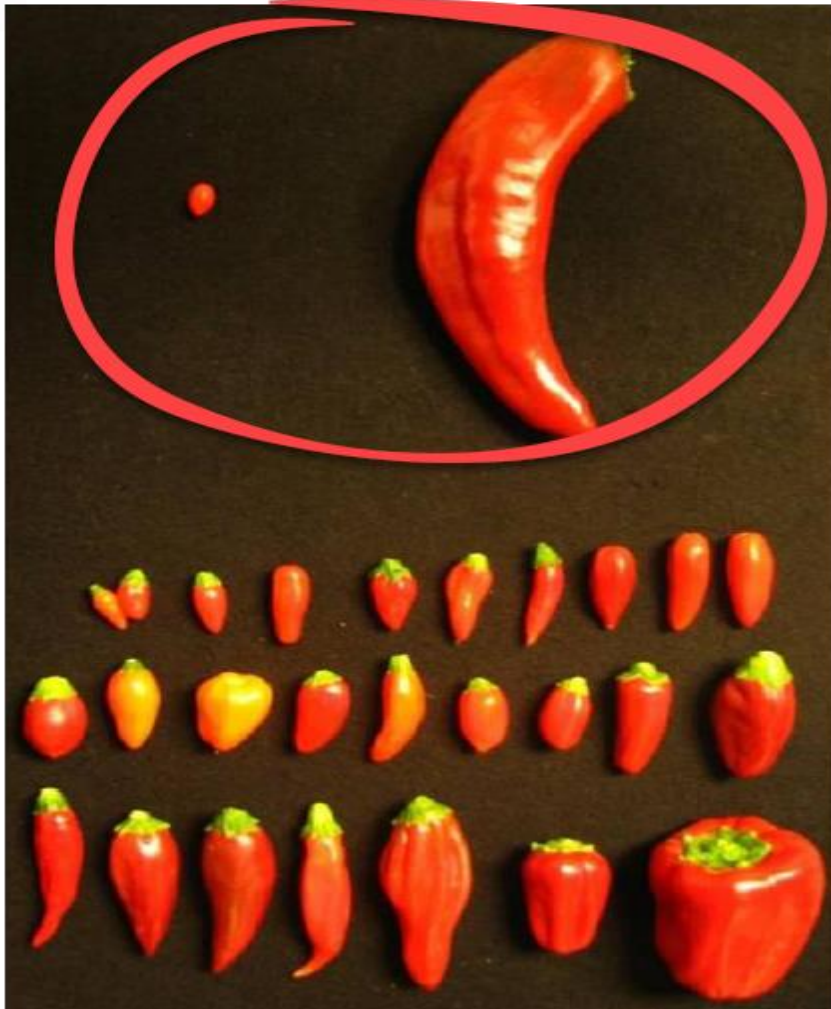
Plants from within the following groups will cross with each other:



- Zucchini, Yellow Crookneck, Acorn, Spaghetti, Patty Pan, Delicata, Pumpkins and Gourds (except edible snake gourds) all may cross with each other.
- Butternut, Buttercup, Banana, Hubbard and Turban squashes may cross with each other.
- Muskmelon, Cantaloupe, Charentais; Honeydew; Casaba; Armenian Cucumber; Snake melon (gourd) can all cross with each other, but not with squashes, pumpkins, or cucumbers.
- Cucumbers, watermelon, and Loofah gourds only cross only with themselves, so you don't have to worry about isolating them unless you are growing several varieties of the same type.



- These are the results of cross pollinating the two pepper plants
- List of plants that will cross pollinate with others-and your seeds won't breed true





=



Two more terms



- **Annuals**—complete the life cycle in one season—
 - plant seed in spring, flowers, grows fruit, fruit ripens, collect seed in fall.
- **Biennials**—complete life cycle in two seasons.
 - Carrots—plant seed, carrot produces leaves while the root develops. You harvest the carrot in fall, but the plant does not develop flowers until the following summer if you replant your best carrot. You can collect seeds after it flowers the second year.



Life Cycle of a biennial: Cabbage



Credit:

The Complete Guide to Saving Seeds

322 Vegetables, Herbs, Fruits, Flowers, Trees, and Shrubs

by Robert E. Gough



THE COMPLETE GUIDE TO
SAVING SEEDS

322 VEGETABLES, HERBS,
FLOWERS, FRUITS,
TREES, AND SHRUBS

- Preserve favorite tastes and scents
- Customize your garden plants
- Promote diversity



ROBERT GOUGH AND CHERYL MOORE-GOUGH



Afraid of making a “mistake?”



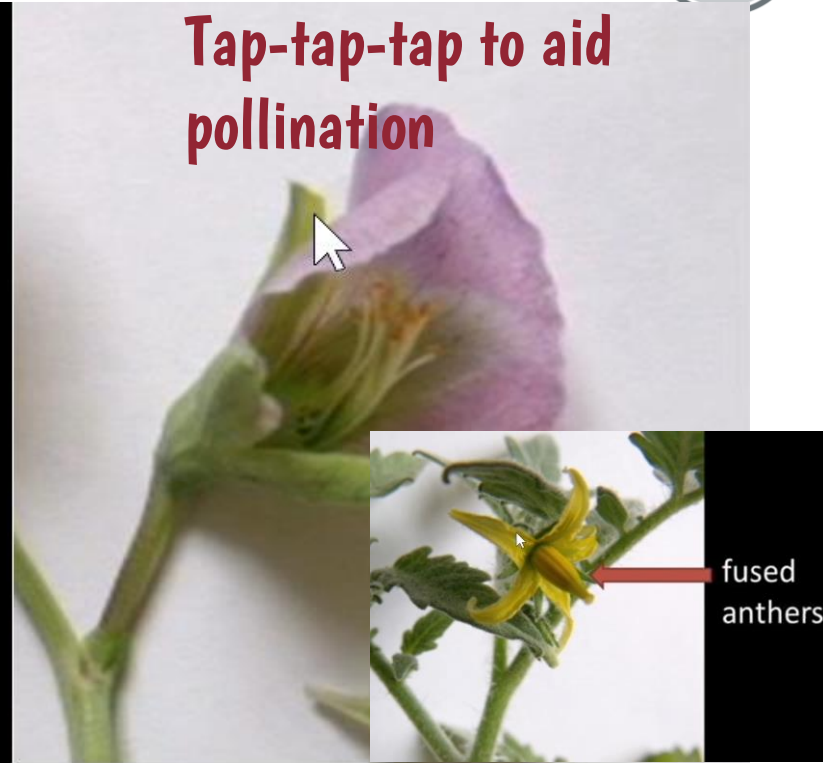
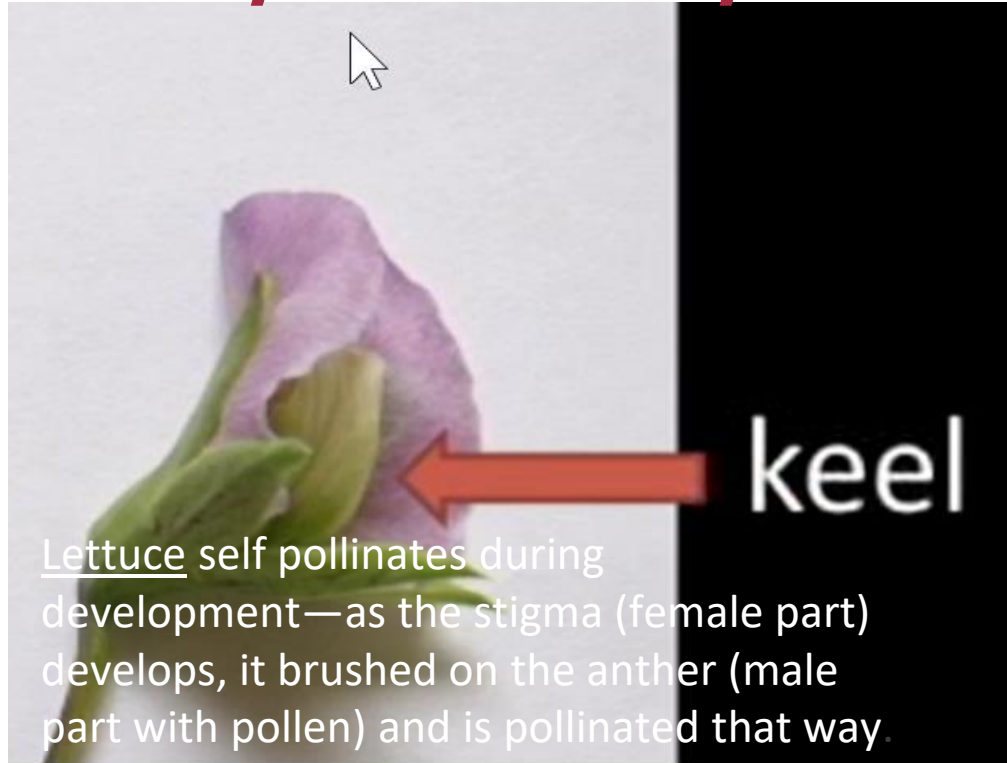
- While the goal of a Seed Library is to collect varieties “pure” seeds—(which will produce plants that are identical to parent), don’t be afraid to experiment!
- A cross pollination “mistake” should be viewed as an opportunity—Have fun!
- What do you have to lose? You can still eat your “mistakes” and you might even discover a better vegetable with your F₁ hybrid!

Self pollinating plants



- Tomatoes, beans, peas, and lettuce are good choices for seed saving because they are frequently self pollinated and complete growing cycle in one season
- If you save seed from an open pollinated plant and there has not been any cross pollination from another plant (of the same species) then you can expect the seed will produce the same plant next year.

Self pollinating plants: Peas, Beans, Tomatoes, Lettuce



Selecting the best plant for seed-saving: What are your criteria?



- Disease and pest free
- Early ripening
- Slow bolting
- Good flavor
- Resistance to cracking
- Root size
- Hottest peppers (depends on climate, water and fertilizer used)
- Hardiness

Let's save some seeds!



- START SMALL!
- Grow something that you LOVE
- Hands-on—trial and error—still the best way to learn!

Let's save some seeds: The BASICS



- Which plants?
- When to harvest
- How to harvest
- Prepping/drying seed
 - “Dry seed”
 - “Gel-coat” seed
- Seed storage

How to store GOOD DRY seeds- The BASICS



- Harvest from HEALTHY, VERY MATURE plants—the best specimen you have
- Seeds must be CLEAN AND DRY

Let's save some seeds!



- Peas, Beans, Legumes
- Lettuce
- Solanaceous vegetables (tomatoes, eggplants, peppers)
- Brassicas (kale, broccoli, Brussels sprouts, cabbage, cauliflower, spinach, chard, beets)
- Cucurbits (cucumbers, melons, squash)

Harvesting DRY SEEDS



E.g., peppers, herbs, beans, lettuce, carrots, onions

General guidelines (vary by species):

- Collect seed before 10:00am (after dew is gone)
- Collect from healthy plant, without diseases, insect eggs, etc.
- Collect fruits and vegetables when well ripe - not all ripen at same time (4-8 week)
- General guideline is to harvest when 60 - 80% of seeds are ripe.

Harvesting DRY SEEDS



Look at:

- Color of fruit/seed/pod
- Dryness of seed and/or pod = spinach or onion - cut seed open and see if the inside is starchy instead of milky
- Ease of detachment of seed and/or seed pod from the stalk

Dry Seeds



- E.g. Peas, beans, lettuce, brassicas (cabbage family), carrots, herbs, ornamental flowers
- Harvest seeds when completely mature and dry
- Store the seed heads/pods in a dry area—garage—until they get crumbly
- Crumble the seed heads/pods in a bowl
- Separate seeds from chaff by screening or winnowing

Beans, Peas, Legumes



- Pods should be allowed to dry on the vine
- Plants should be totally dry—stems, leaves, and pods
- Dried pods need to be very dry, thin, and papery.
- Break over bowl
- Store seed in a freezer for 7-10 days to kill any weevils. Seed must be totally dry to prevent damage from the freezing process.



Beans & Peas



Peppers



- Very mature fruits.
- The color change from green to red, orange or yellow
- Fruits -dull and slightly soft, but not rotten
- Cut through the shoulder of the fruit and gently scrape the seeds from the fruit, and spread them out to dry
- Hot peppers can be left on the plant until most of the fruits are dry, then pull the plants out with the roots intact and hang upside down in a warm dry area to store until using.



Lettuce

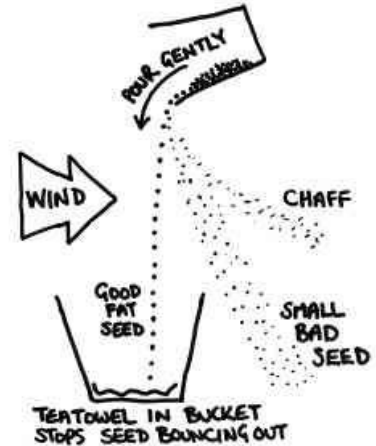
- For seed saving, you may harvest a few outer leaves before lettuce bolts
- Seeds are ready 21 days after bloom.
- To harvest, vigorously shake the seed head into a bag every day during that period. The loose seed will fall into the bottom of the bag.
- An alternate method -wait until about 10 days after flower and then cut the whole plant. Place the seed head upside down into a bag. When the seed head is totally dry, vigorously shake while seed head is still in the bag.



Brassicas



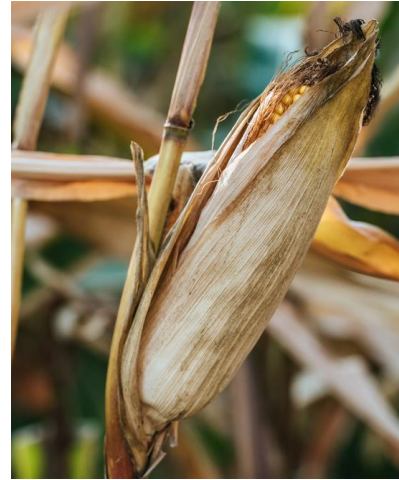
- Love to cross pollinate with each other, only let ONE plant go to seed
- Harvest when seed pod halfway up the stalk is full of seed that have plumped up as much as they are going to, and are just starting to go brown
- Hang flower stalks up to dry
- Then break open over a bowl
- Use a sieve to screen bits of pod, or let wind winnow it



Corn



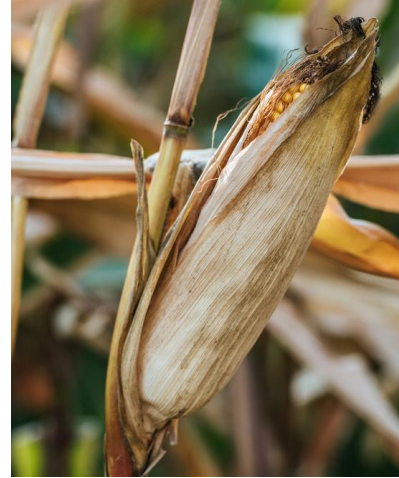
- Leave the stalks on the plant until they are completely dry.
- If the rain starts before they are dry, you can choose mature cobs, husk them, and dry them under shelter for 2-3 months.
- Dry them at moderate temps (<math><95^{\circ}</math>). Leave the kernels on the cob until both the cob and kernels are dry.



Corn

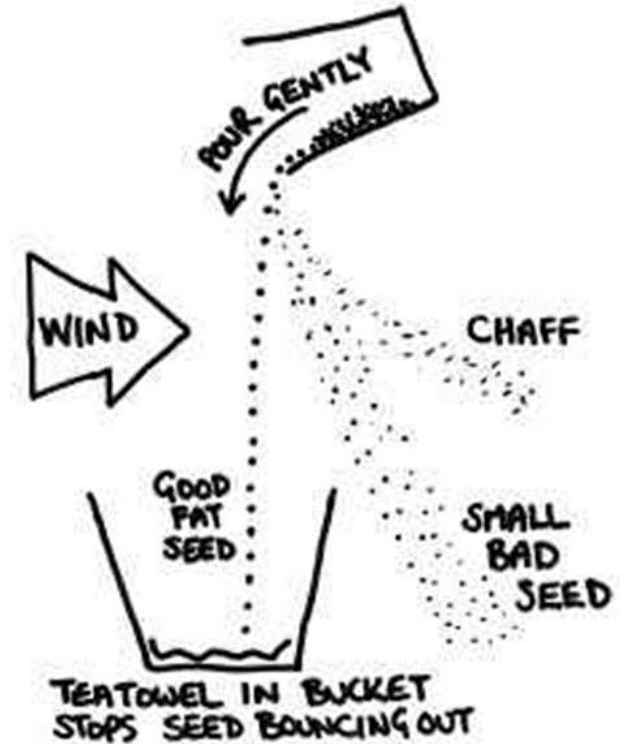
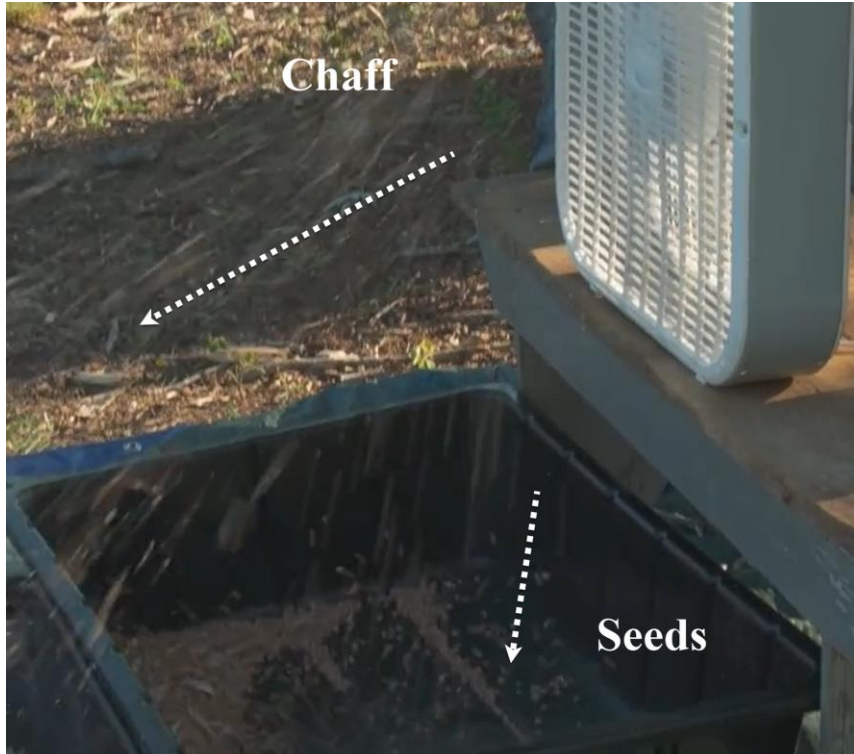
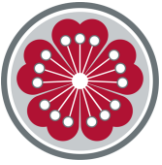


- To remove the kernels, rub two cobs together to loosen kernels.
- Winnow any plant debris so all you are saving are the kernels.
- If you can, save a combination of seeds taken from as many ears as possible to help prevent inbreeding problems.



Cleaning Dry Seeds

- Winnowing—use a breeze or fan



Separating seed from chaff



- Hardware cloth frame—
rub seed head/pod over
frame—seeds in box, chaff
on top of frame



<https://driftlessprairies.org/wp-content/uploads/2013/10/DSCF8518-1024x768.jpg>

Large holes to small



55Heritage Farm <https://www.youtube.com/watch?v=8L13a88c-uk>



Search for "seed cleaning sieves"



Harvesting wet seeds



- Two types
 - Surrounded by **pulp**--E.g., eggplants, squash, melons
 - Surrounded by **gel coat** (inhibits germination)--E.g., tomatoes, cucumbers

General directions for saving seeds from fleshy veggies (no gel coat)



- In the squash or melon cavity, work seeds between your fingers to release from the pulp.
- Soak in cool water 3-24 hours in a COOL place
- Drain in sieve, dry bottom of sieve
- Place on glass, metal, or plastic plate
- Put seed in a dry, warm place (not hot) out of direct sunlight.
- Stir the seed twice a day until completely dry, about 1-2 weeks.
- Bend vs Snap test, moisture-proof container
- Store in cool, dry, dark place



SUMMER AND WINTER SQUASH

- **Winter squash** - fully ripe (when the rind is too hard to dent with a fingernail and the stem is dry.)
- Stored at room temperature for 2-3 additional months before harvesting seed to increase seed quality/germination rate.
- **Zucchini and summer squash** -very large & over ripe, hard skin that has changed color. In long varieties, save seeds only from fruit furthest from the stem
- Store at room temperature for 3-4 additional weeks.



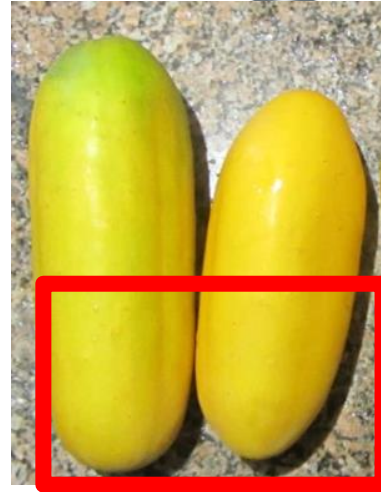
EGGPLANT

- Fruits need to be very over-mature
- Leave ripe fruits on the plant for 4-5 extra weeks to allow seeds to fully mature.
- Color should change to tan or brown, tough, dulled skin
- Save seed from bottom 1/3 of the fruit. Seeds closer to the stem will be immature.
- To separate seed from the flesh use a box grater or a food processor with small amount of water.



Wet seeds surrounded by gel coat

- E.g., Tomatoes and cucumbers
- Harvest fruit when fully ripe on vine. Cucumbers should be turning yellow—overripe.
- Cut fruit open and squeeze out seeds and pulp into a jar. Add just enough water to cover (1:1). Cover with wax paper or paper towel--warm 72°-85°.
- The mixture will **ferment**, and turn moldy. This will help to remove the gel-coat from the seed. Stir gently a couple times a day.



Wet seeds surrounded by gel coat



- After 3-6 days, moldy pulp and bad seeds will float to the top.
- Carefully pour or spoon off moldy material.
- Add water, rinse seed. If any seeds float to the top, discard them.
- Use strainer to catch seeds, rinse again.
- Place seeds in a single layer on glass, metal, or plastic plate to dry—may take 3-4 days.



DRYING SEED the basics



- Dry as quickly as possible to reduce disease potentials
- Spread seeds out in thin layer
- (screen, plywood, sheet pans, hard, non-stick surface).
- Don't use paper towels, newspaper, cardboard, or cloth as seeds will stick and become damaged.
- Don't expose seeds to temps above 95°
- Use screen, metal or glass pan to finish drying

Other ways to dry seeds

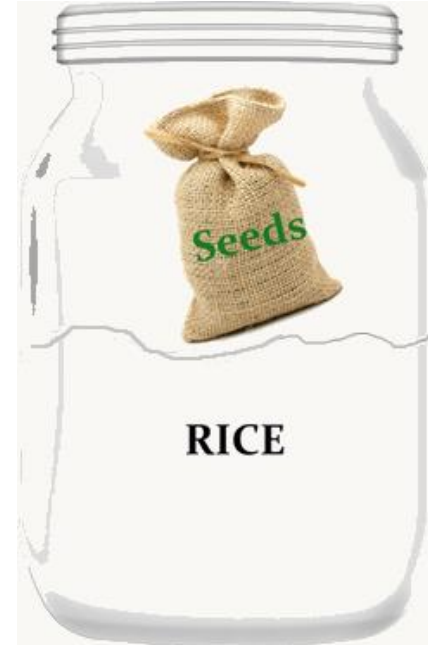


- Use silica gel - place packet of seed in airtight container and place silica gel in. Remain for 2-7 days. Do not let gel come in contact with seeds
- Small seeds ready for storage = 3-5% seed moisture
- Large seeds ready for storage = 5-7% seed moisture
- Below minimum %'s and seed may become damaged.
- Use food dehydrator--85F - time will vary based on seeds-- around 6 hours, but check to make sure they don't get too dry.

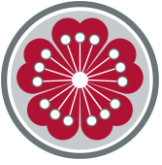
Surefire way to ensure dry seed



- Bake 1 cup rice in the oven for 45 minutes until it is bone dry.
- While it is still hot, put it in a pint (2-cup) glass jar, and screw the lid on
- Allow rice to COMPLETELY COOL.
- Put seeds in a thin sock, secure with rubber band.
- Place sock in jar, screw lid on tight for 24 hours



Is the seed DRY? Bend vs Snap test



Is the seed DRY? Envelope test



- Place envelope in container with seeds. Leave overnight.
- Next day, compare envelope from container with envelope not left with seeds.
- If container envelope seems damp, then seeds are not dry enough to store in container.
- Tip: Use a few rice kernels to absorb moisture

DAMP SEEDS are the most common failure of seed saving.

How to store GOOD DRY seeds



- Use moisture-proof, airtight Glass containers
- Store seeds in dry, cool and dark conditions.
- Label containers carefully with variety and date –seed longevity 1-5 years

Storage Temperatures



- Use moisture-proof, airtight GLASS containers
- Store seeds in dry, cool and dark conditions.
- Label containers carefully with variety and date –seed longevity 1-5 years

Storage Temperatures



- **Refrigerator** - medium term storage
- **Freezer** - good for long term storage of seeds.
- Moist seeds will freeze.
- Seeds must be in air-tight container and must be very dry.
- Allow to reach room temperature before opening container.
- Freezing will kill any hitchhiking insects or eggs
- Note:

For each 10% decrease in seed moisture, life of seed doubled

For each 10° decrease in temp, life of seed is doubled.

Storage Times

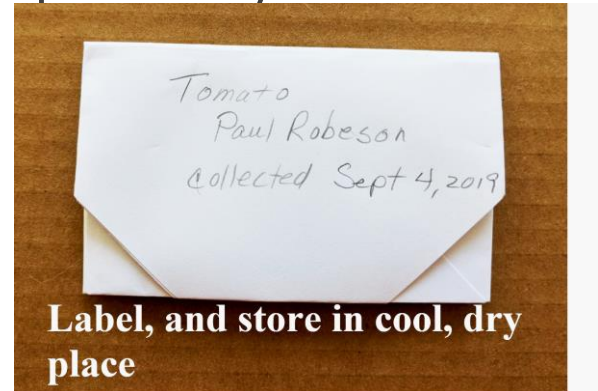


- Most vegetables = 3-5 years if stored properly
- Short lived seeds = onions, leeks, parsnips = 1-2 years

LABELING

- Type of plant
- Variety name
- Year seeds were last grown
- Maturity days
- Height/habit/fruit size/color/disease resistance, etc.
- Great link for storage times for various seeds:

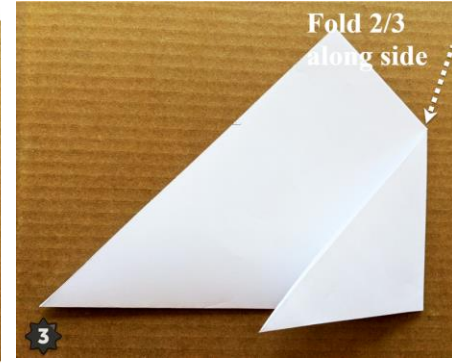
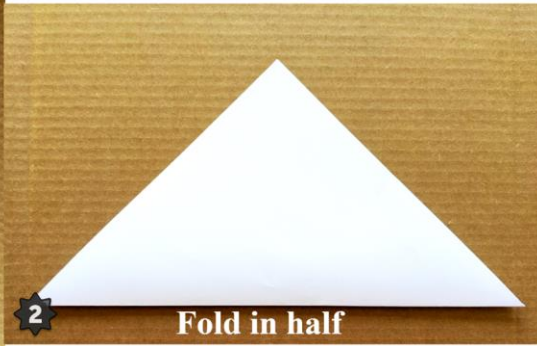
<https://ucanr.edu/sites/cetrinityucdavis.edu/files/258734.pdf>



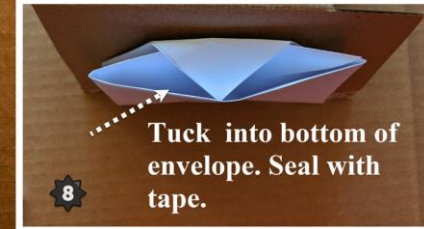
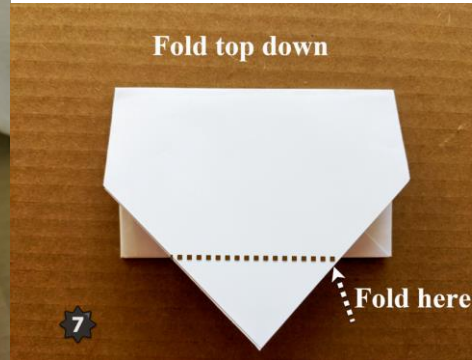
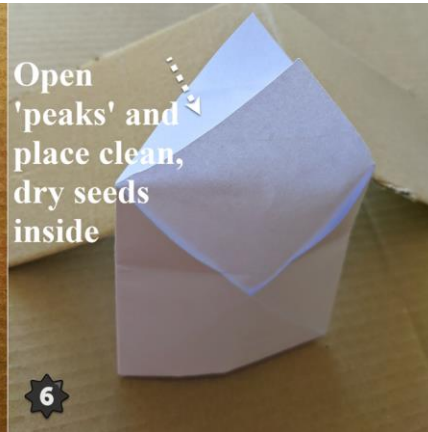
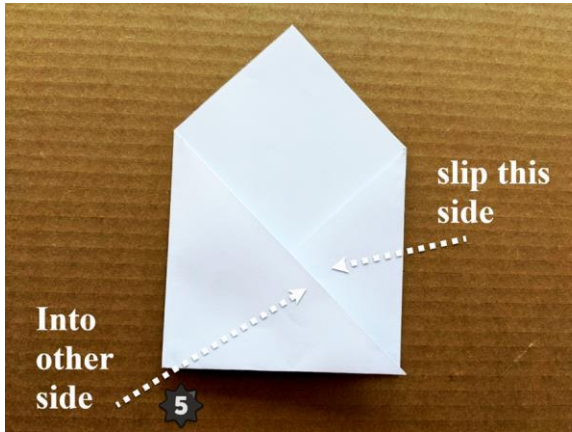
Storage life of seeds--summary



- **1 year:** onions, parsnips, parsley, salsify, and spinach
- **2 years:** corn, peas, beans, chives, okra, dandelion
- **3 years:** carrots, leeks, asparagus, turnips, rutabagas
- **4 years:** peppers, chard, pumpkins, squash, watermelons, basil, artichokes and cardoons
- **5 years:** most brassicas, beets, tomatoes, eggplant, cucumbers, muskmelons, celery, celeriac, lettuce, endive, chicory



Make a seed envelope



Take it home!

- Review of concepts important to seed saving:
 - Flower types
 - Hybrids, heirlooms, open pollination
 - Annual and biennial plants
 - Self-pollination vs cross pollination
- Harvesting dry seeds _c
 - Cheat sheet for most veggies
<https://ucanr.edu/sites/cetrinityucdavis.edu/files/258733.pdf>
- Harvesting wet seeds
- Seed storage



For links to this workshop video, slides, and resources handout, contact

garyf@wsu.edu

You can also access them on our website: **cowlitzcomg.com** (look for 2021 workshop videos on the homepage menu)

Resources:



***Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners, 2nd Edition* - by Suzanne Ashworth**

***The Complete Guide to Saving Seeds: 322 Vegetables, Herbs, Fruits, Flowers, Trees, and Shrubs* - by Robert E. Gough & Cheryl Moore-Gough**

Vegetable cross-pollination guide: <https://theseedbank.net/articles-info-how-tos/vegetable-cross-pollination-guide/>

Heirloom Seed Library 2017 and Seed Saving Instruction Guide

Available: <https://s3.wp.wsu.edu/uploads/sites/2083/2015/05/HG-Seed-Catalog-2017-2-small.pdf>

Seed Saving, University of Minnesota <https://extension.umn.edu/planting-and-growing-guides/saving-vegetable-seeds#harvesting-823210>

Open Source Seed Initiative: <https://osseeds.org/> Seed List: <https://osseeds.org/seeds/>

Make Seed Envelopes: <https://getbusygardening.com/easy-seed-envelopes/>