UC Master Gardeners
of Nevada County

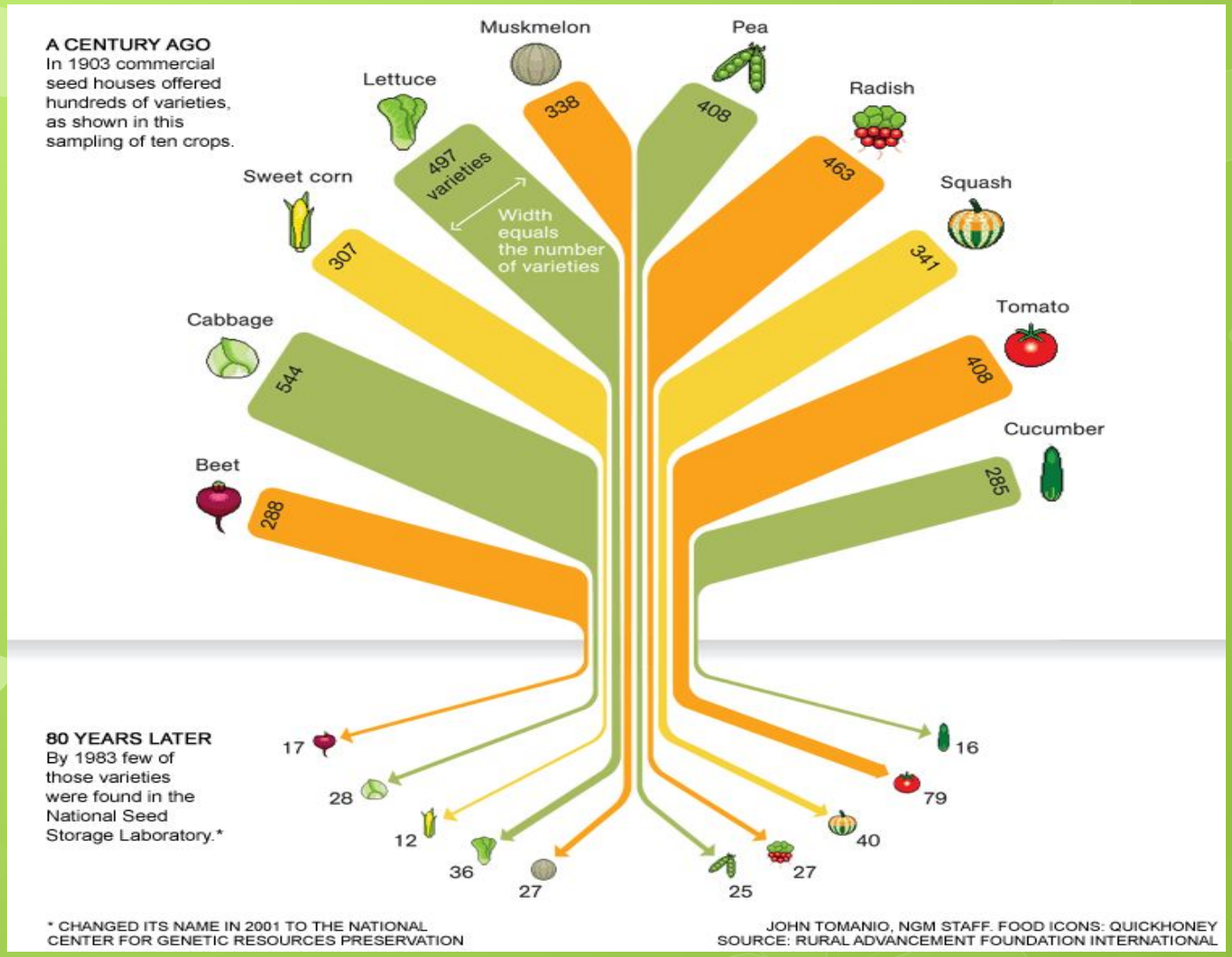
presents

Seed Saving Basics

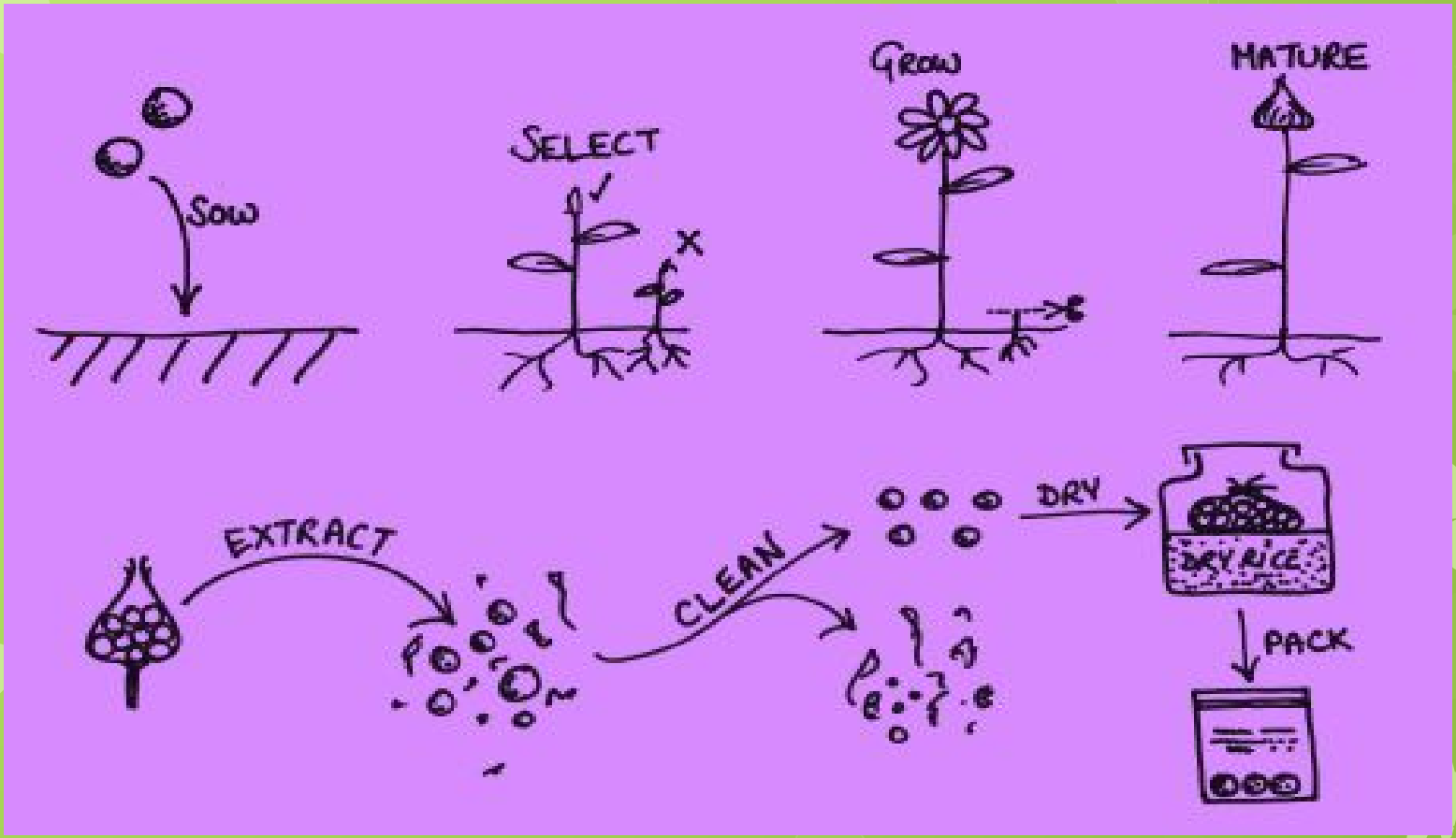
why save seeds?

- Cultivate locally acclimated plants
- Preserve natural plant diversity and protect heirloom varieties
- Better nutritional value
- Reduce gardening costs and increase local sustainability

let’s maintain seed diversity



step by step seed saving



start with open-pollinated seeds

Open Pollinated Seeds

- Many traditional varieties are open-pollinated. This term is commonly used for what is really controlled pollination, where plants have been in-bred for several generations and have a stable genetic make-up, and out-crossing from different varieties is prevented.
- Seed saved from such “open-pollinated” crops will breed true to type.

Hybrid Seeds

- Many varieties of vegetables and fruits are “hybrids”. This is often designated by a F1 appearing after the variety name. Hybrid varieties tend to have favorable characteristics like high yield, good color, disease, or fruit uniformity.
- Hybrids are produced from crosses between two distinct, inbred parent lines. The seed from hybrid plants is not usually saved for future plantings, because it does not produce plants that are true to the original hybrid variety you planted.

be picky in your seed selection

- Saving seeds requires planning and preparation to ensure that quality seed with the desired characteristics are selected. The first step is to decide how much seed you want to save of each variety. This will determine the number of plants that will need to be manipulated during the growing season
- Plant attributes- free of disease, slow bolting, color, shape, taste, texture.
- The key to producing superior seeds is heavy selection. Never eat the best tomato as you would never slaughter the goose that lays golden eggs

selection traits

- Vigor
- Early or late bearing
- Good fruit texture
- Cold hardiness
- Shape
- Superior taste
- Long storage life
- Disease resistance
- Resistant to insect pests
- Ability to compete with weeds
- Drought tolerance
- Slow bolting
- Productivity
- Large fruit or flowers

isolate your plants for pure seed

Plan your garden to reduce cross-pollination:

- Plant one variety per species, or only allow one variety to go to seed.
- Separate varieties by planting something tall in between (ex. corn or sunflowers) or plant on different sides of your house.
- Have a friend plant another variety and share produce.
- Stagger the planting of two varieties within a species so that pollination time does not overlap; pollination occurs during flowering so note when flowers of different varieties are open.

Seed Saving for Beginners - Why Save Seeds?

Vegetable	Cycle	Pollination	Pollinator	Isolation Distance	Seed Longevity	Notes
Bean	A	Self		100'	2-3 yrs	Lose vigor rapidly.
Soybean	A	Self		100'	2-3 yrs	Space farther apart than for market crops.
Beet/Chard	B	Cross	Wind	1/2 mi	3-5 yrs	Beets cross with chards.
Broccoli/Kale/ Cauliflower	B	Cross	Insects	1/2 mi	3-5 yrs	Hot-water treated seeds last only 1 yr. Crossing among brassica species is complex, consult a good reference book.
Carrot	B	Cross	Insects	1500'	2-3 yrs	Crosses with wild species.
Celery	B	Cross	Insects	1500'	2-3 yrs	
Corn	A	Cross	Wind	1/2 mi	2-3 yrs	Adequate population essential.
Cucumber	A	Cross	Insects	1500'	5-10 yrs	Harvest at yellow blimp stage.
Eggplant	A	Self		150'	2-3 yrs	
Leek	B	Cross	Insects	1500'	2 yrs	
Onion	B	Cross	Insects	1500'	1 yr	
Lettuce	A	Self		50'	2-3 yrs	Start indoors, need long season for seed.
Melon	A	Cross	Insects	1500'	5-10 yrs	Muskmelons will not cross with watermelons.
Mustard	A	Cross	Insects	1/2 mi	3-5 yrs	Crosses with wild species.
Pea	A	Self		50'	2-3 yrs	Do not save seed from diseased plants.
Pepper	A	both	Insects	500'	2-3 yrs	Some varieties cross more readily than others.
Radish	A	Cross	Insects	1500'	3-5 yrs	
Spinach	A	Cross	Wind	1/2 mi	2-3 yrs	
Squash/Pumpkin	A	Cross	Insects	1500'	2-5 yrs	moschata 2-3 yrs, pepo & maxima 3-5 yrs. These three species generally do not cross.
Tomato	A	Self		25'-100'	5-10 yrs	Potato-leaf types need the greater isolation distance.

Cycle: A=annual, B=biennial.
Pollination: Self=self-pollinated, Cross=cross-pollinated by another plant.
Isolation Distance: recommended distance by which different varieties must be separated to prevent unwanted cross-pollination.
Seed Longevity: Averages, not guarantees. Seed longevity depends on the conditions under which the crop was grown and how the seeds have been stored.
Minimum Populations: Crossers require minimum populations to maintain vigor and avoid inbreeding depression. Recommended minumums number of plants: 25 cucumbers, squash, melons; 50-100 radishes, brassicas, mustards; 200 sweet corn.

annual vs. biennial

- Many vegetables are annuals, which produce their seed in one year. Annuals, such as tomatoes, lettuce, beans and peas are good candidates for your first seed-saving project. They are generally self-pollinating, and their seeds will produce plants like the parent plant.
- Biennial vegetables, such as beets, carrot, parsnip and parsley, require two growing seasons to produce seed and require a bit more effort. Try leaving some of your late carrots and beets in the ground. Mulch them thickly with straw or cardboard and straw. Many plants will survive the winter and begin to grow the following spring. They should flower and produce seeds during the summer. Cabbage is also a biennial, but it doesn't winter over as readily. Cabbage heads can be pulled up in the late fall before the ground freezes, stored at cold temperatures and replanted in the spring. Beets and carrots can be handled this way, too. After re-planting the second year, they will produce seeds, which you can harvest and save for the following year.
- Source: http://extension.umass.edu

harvesting seeds

- Always harvest mature seed. For example, cucumber seeds at the eating stage are not ripe and will not germinate if saved. You must allow the fruit and seed to fully mature.
- Wait until near the end of the season to save fruit for seed because seed set reduces the vigor of the plant and discourages further fruit production.
- Seeds are mature or ripe when flowers are faded and dry or have puffy tops. Plants with pods, like beans, are ready when the pods are brown and dry. When seeds are ripe they usually turn from white to cream colored or light brown to dark brown.

dry seed saving method

Beans, peas, onions, carrots, corn, most flowers and herb seeds are prepared by a dry method.

- Allow the seed to mature and dry as long as possible on the plant.
- Complete the drying process by spreading on a screen in a single layer in a well-ventilated dry location.
- As the seed dries the chaff or pods can be removed or blown gently away. An alternative method for extremely small or lightweight seed is putting the dry seed heads into paper bags that will catch the seed as it falls out.
- Decant seeds to remove chaff and separate viable seeds

decanting seeds

Decanting separates viable (living seeds) from unviable (dead) seeds; often seed savers decant after also soaking or rinsing seeds.

Put the seeds and pulp in a big container and cover with about four times as much clean water.

Put your hand in and rub the pulp and seeds around a bit to loosen things up. Wait a few minutes and you will see that good seeds sink to the bottom and dead, lightweight seeds float to the top.

Skim off the dead seeds and any pulp from the top.

Pour the water and good seeds through a screen or strainer and then start over with new water, following the process another 3-6 times until the seeds are clean.

wet seed saving method

Seed contained in fleshy fruits (tomatoes, melons, cucumbers) should be cleaned using the wet method. These seeds are surrounded by a gel that stops the seeds from germinating and protects the seeds from disease. In nature that gel would break down over time, but seed savers need to break it down faster so that they can dry and store their seeds. To do so they ferment the seeds.

- Scoop the seed masses out of the fruit or lightly crush fruits. Put the seed mass and a small amount of warm water in a bucket or jar. Let the mix ferment for two to four days. Stir daily. The fermentation process kills viruses and separates the good seed from the bad seed and fruit pulp. After two to four days, the good viable seeds will sink to the bottom of the container while the pulp and bad seed float. Pour off the pulp, water, bad seed and mold. Spread the good seed on a screen or paper towel to dry.
- Chlorine in water can kill tomato seeds. If your tap water is chlorinated, use a filter or let water sit for a few days uncovered to let the chlorine evaporate

drying your seeds

Moisture is seed savings worst enemy. Be sure to finish drying them completely. Drying the seeds thoroughly is extremely important and if it isn't done well then your seeds are much less likely to germinate next year and are susceptible to mold, fungus and bacteria.

Here are the steps for drying seeds:

1. Spread seeds out on a screen or tray in a warm (not above 95°F), dry place that has good air flow.
2. If there isn't a lot of air flow, set up a gentle fan near the seeds.
3. Stir the seeds occasionally so that they dry on all sides.

label and store your seeds

- After allowing the seed to dry, funnel the seeds into small paper bags, small glass jars, sealable bags, or other moisture-proof containers.
- Clearly label with the date, species and the variety.
- Store your seed packets in a cool, dry, dark location until you are ready to plant.
- If stored seed becomes moist and warm, some may begin to germinate or become moldy and contaminated with pathogens. A kitchen freezer is an ideal location for storing seed.

test your seed's quality

If saved and stored under ideal conditions, seeds can remain viable for many years. There are several easy ways that you can determine whether your seed will still grow if planted:

- Floater test: Place seeds in a jar of water and remove any that float. The floating seeds are less dense than viable seed because they are either damaged or never developed the seed embryo. Make sure to dry the seed again before storage.
- Germination tests: Arrange 10-15 seeds in between several damp paper towels making sure that no two seeds are touching. Place the towels and seeds into a sealable plastic bag and leave them someplace warm for two weeks. After two weeks, open the paper towels and count how many seeds have sprouted. This number divided by the original number of seeds is the damp towels can be used to calculate an approximate germination rate.

Seed Saving Tips

Grow your favorite plants again, save money, trade seed and preserve plant diversity.

Beans	Let the pods age on the vine until they turn brown. You can also store the entire plant (with roots) upside down in a warm area until pods dry out. Cross-pollination could affect the purity of your bean seeds in the future. Pole beans are more likely to cross.
Cantaloupe	Best time to collect seed is when the stem dies and the fruit separates easily. Remove the membranes from the seed by rinsing and gently rubbing with your fingers.
Cucumber	Harvest seed when cucumbers are fully ripe and yellowed (too ripe for eating).
Lettuce	Let seed pods dry on the plant. Bag the plant to capture the seeds because they progressively fall off from bottom to top. Do not save seed from plants that bolt too soon. The seed you save may produce plants that go to seed prematurely.
Peas	Wait until the plant dies and collect the seeds. Peas do not cross-pollinate.
Peppers	Best time to collect seed is when peppers are full color and beginning to shrivel. Brush off the seeds from the inside stem and let dry. Peppers of the same species could cross. Grow one hot type and one sweet type to prevent cross-pollination.
Pumpkin	Remove seeds three weeks after harvesting the pumpkin. Varieties within the same species can cross. Rinse off membranes and dry well.
Squash (Summer)	Harvest seed when the squash has a hard skin and is too ripe to eat. Hold the seeds under water and rinse off the membrane. Avoid cross-pollination-do not plant these species together: *Cucurbita Pepo, Cucurbita Moschata, Cucurbita Maxima and Cucurbita Mixta.*
Sunflower	Most sunflowers are hybrids. Save heirloom seeds if you want the flower to stay true. Hang flower heads upside down by a short length of stalk in a cool, dry spot. Once dry, remove the seeds and keep dry until planting.
Tomato	Save seed when fruit is full color and firm, but still tender to the touch. Remove the protective gel covering the seed. Cross-pollination may occur with wild or currant tomatoes but most popular types will not cross. Ensure space between plants.
Watermelon	Remove fibers and membranes by rinsing. When dropped in a glass of water, viable seeds will sink to the bottom. Seeds that float may not germinate well.

The table to the left lists several popular annual vegetables and fruits with easy-to-save seeds and a lower potential for cross-pollination in the home garden. They flower and mature seed in the same year. General advice is given to maintain as much seed purity as possible when plants are more prone to cross. Please seek out other references to enhance your knowledge of seed saving.

Seed Saving Basics

~Save seeds from **heirloom** or **open pollinated (OP)** plants only if you want them to stay true. Hybrid seed will not produce the same plant again.

~Choose the healthiest plants and the largest seeds.

~Air dry seeds on a fine screen or paper away from direct sunlight and as quickly as possible to reduce contamination.

~Label seed (drying and storage).

~Use containers that limit moisture.

~Drying may not be necessary if planting soon after collection.

it’s all gone to seed

photo gallery

carrot

radish

peas

lettuce

leek

turnip

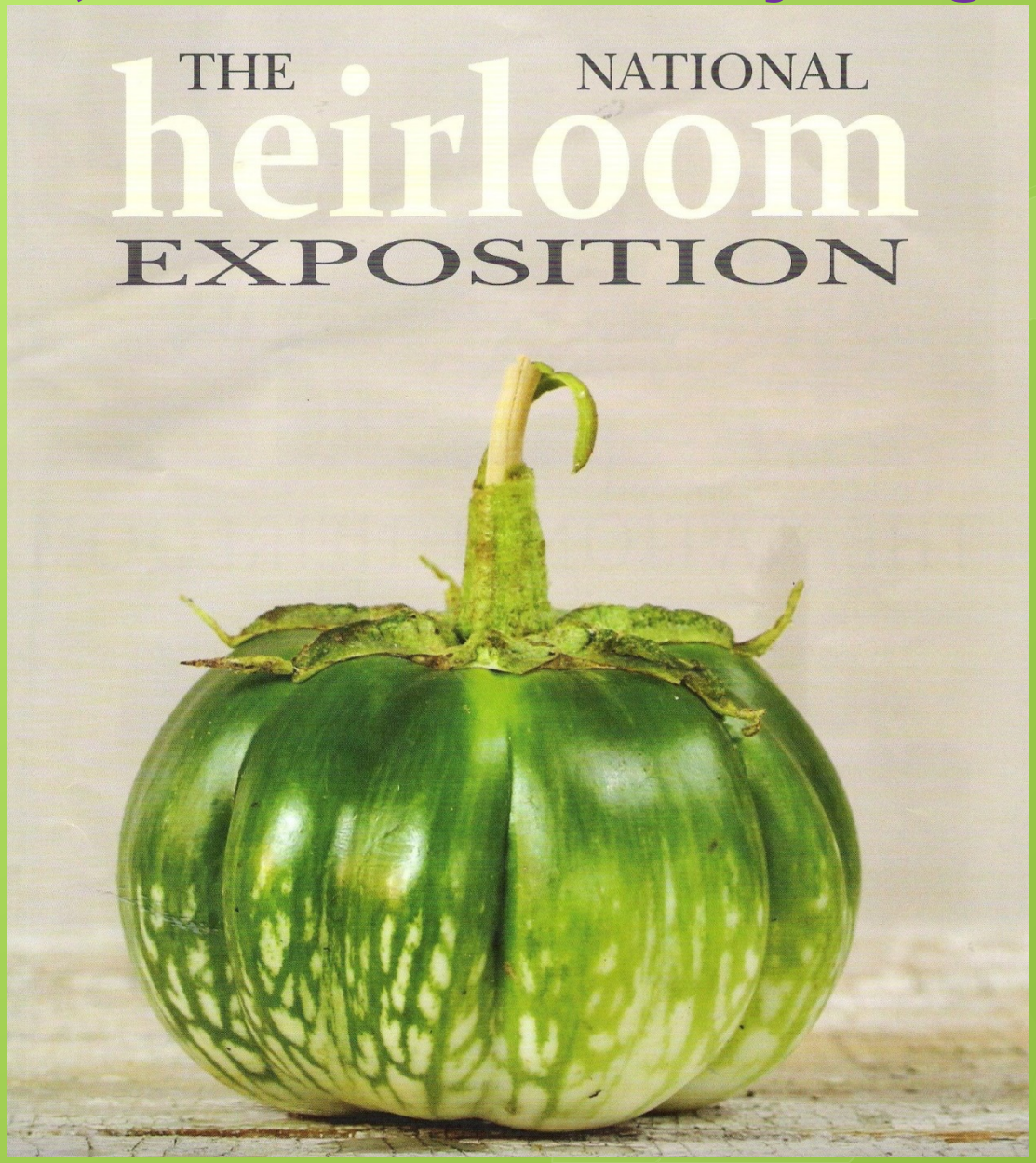
spinach

beets

chard

bag seed heads to avoid shattering

Sept. 5-7, 2017 Sonoma County Fairgrounds



www.seedsavers.org

- Webinars
- Seed Catalog
- Educational Resources
- Blog
- Seed Preservation

bibliography

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Saving Seeds: The Gardener's Guide to Growing and Storing Vegetable and Flower Seeds by Marc Rogers

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