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Yavapai County
Master Gardener Association

Seed Saving
September 2022

Disclaimer

This presentation is focused exclusively at the home gardener who wishes to save non-patented seeds for their own use.

Four Basic Steps in Seed Saving

1. Identify the seeds you want to save
2. Collect seeds
3. Clean seeds
4. Store seeds

Terms to Know

Seed Saving - In agriculture and gardening, seed saving is the practice of saving seeds or other reproductive material from vegetables, grain, herbs, and flowers for use from year to year for annuals and nuts, tree fruits, and berries for perennials and trees. (from Wikipedia)

Seed Sovereignty - Seed sovereignty can be defined as the right “to breed and exchange diverse open-sourced seeds. (from Wikipedia)

Brown Bagging – The practice of selling seed off the farm without the proper certification. A term often used by Monsanto.

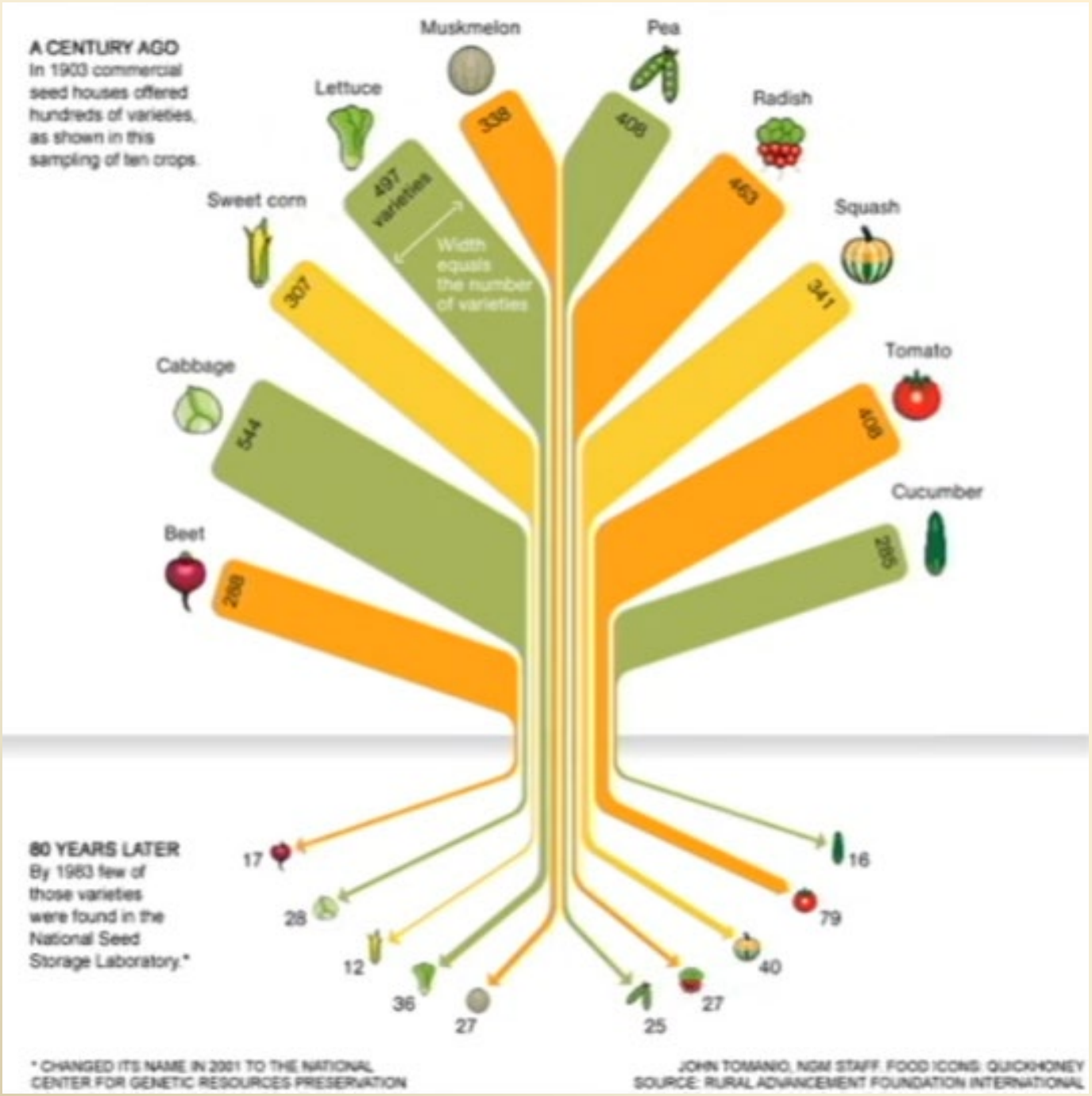
Industrial Agriculture - A form of modern farming referring to the industrialized production of livestock, poultry, fish, and crops. The methods of industrial agriculture are techno-scientific, economic, and political.

A Bit of Seed Saving History

- Traditional method for centuries to maintain gardens and farms
- Introduction of Industrial Agriculture started a shift
  - Use of chemicals for control of pests and increase yields
  - Government intervention
  - Corporate model of farming
- Legislation impacting seed saving
  - 1970 - Plant Variety Protection Act
  - 1981 – Diamond v Chakrabarty
  - 2002 - J.E.M. A Supply v. Pioneer
  - 2013 – Bowman v Monsanto Co

The Result

- Seed companies numbering in the thousands have dwindled to 10 major seed and chemical companies
- In 1810, 90% of Americans were farmers, now less than 2%
- Seed Patents direct and control the number and type of seed varieties
- Seed varieties have significantly dwindled in number
- 1983 National Seed Storage Laboratory count showed over a 90% reduction since 1903 in seed varieties stored for just 10 vegetable plants


A CENTURY AGO
In 1903 commercial seed houses offered hundreds of varieties, as shown in this sampling of ten crops.
Muskmelon
Pea
Lettuce
Radish
Sweet corn
Squash
Cabbage
Tomato
Beet
Cucumber
497 varieties
Width equals the number of varieties
338
408
463
307
341
544
408
288
265
80 YEARS LATER
By 1983 few of those varieties were found in the National Seed Storage Laboratory.*
17
28
12
36
27
25
27
40
79
16
* CHANGED ITS NAME IN 2001 TO THE NATIONAL CENTER FOR GENETIC RESOURCES PRESERVATION
JOHN TOMANIO, NGM STAFF. FOOD ICONS: QUICKMONEY
SOURCE: RURAL ADVANCEMENT FOUNDATION INTERNATIONAL

Reasons to Save Seeds

- Save money
- Always have your favorite tried and true variety
- Part of a self-reliant lifestyle
- Maintain locally adapted varieties
- Have a supply to swap with friends

Growing a Plant to Save Its Seed Is Different Than Growing It to Eat

Four Basic Steps in Seed Saving

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Identify Seeds to be Saved

- Start simple
- Identify your favorite vegetables to grow
  - Easiest to save are Beans, Lettuce, Peas and Tomatoes
- Buy the right type of seeds to plant
  - Heirloom (open pollinated)
    - Plants will resemble parents
    - Facilitates varietal purity
  - F1 Hybrid (crosses between two varieties)
    - Inferior plants
    - Unpredictable results

Understanding Pollination

Open Pollination - Pollinated without human intervention and not from a neighboring plant

Cross Pollination – Pollinating occurs between two neighboring plants (not necessarily the same variety)

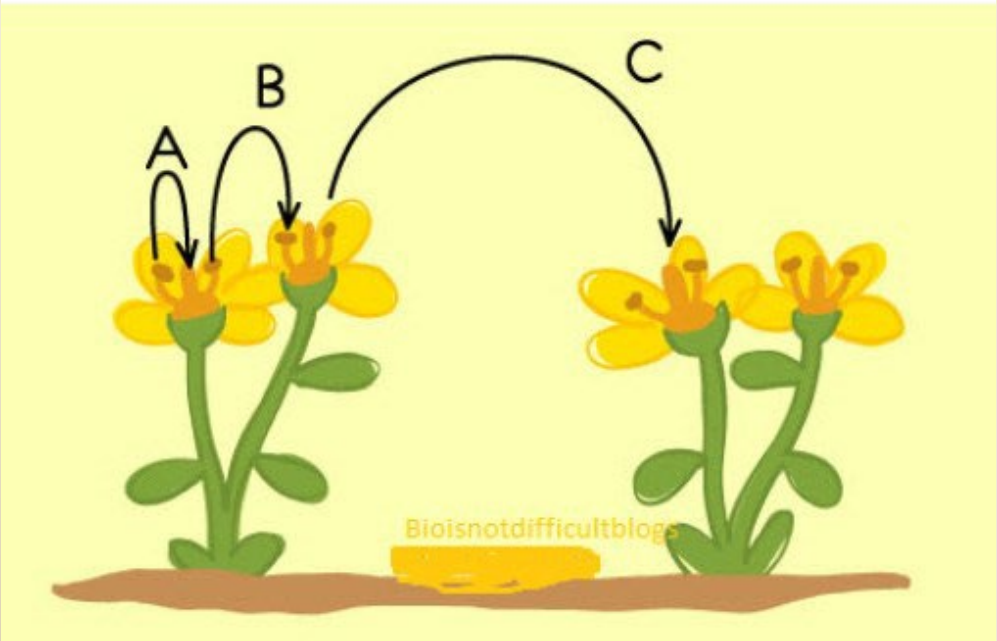

Photo courtesy of bioisnotdifficultblogs

Understanding Pollination (cont.)

Pollinator types:

<u>Self-pollinated</u> – rarely cross-pollinate

a) Easiest: Tomatoes, Peppers, Beans, Peas, Lettuce, Broccoli
b) Biennial more difficult as they need 2 seasons to set seeds: Carrots and Beets

<u>Wind or insect pollinated</u> – Readily cross-pollinate

a) Cucumbers, Melons, Corn, Pumpkins, Gourds, Spinach and Squash
b) For viable seeds from any of these only grow one variety during any given season

What's Important in a Name?

Kingdom
Division
Class
Order
Family
Genus
Species

Plant Name or Binomial

Often called just Species

Examples-

Common name:	Species:
Broccoli	Brassica oleracea
Brussel sprouts	Brassica oleracea
Cauliflower	Brassica oleracea

A Good Tool

Seed Savers EXCHANGE

SEED SAVING GUIDE

Crops	Species	Family	Life Cycle	Primary Pollination Method	Recommended Isolation Distance for Seed Saving	Population Size (Number of plants)		
						Viable Seeds	Variety Maintenance	Genetic Preservation
adzuki bean	*Vigna angularis*	Fabaceae	annual	self	10–20 feet (3–6 m)	1	10–25	50+
amaranth	*Amaranthus spp.*	Amaranthaceae	annual	wind	650–1,300 feet	1	5–25	50+
Armenian cucumber	*Cucumis melo*	Cucurbitaceae	annual	insect	800 feet–1/2 mile (244–805 m)	1	5–10	25+
artichoke	*Cynara cardunculus*	Acteraceae	perennial	insect	800 feet–1/2 mile (244–805 m)	5	20–50	80+
arugula (rocket)	*Eruca sativa*	Brassicaceae	annual	insect	800 feet–1/2 mile (244–805 m)	5	20–50	80+
kale	*Brassica oleracea*	Brassicaceae	biennial	insect	800 feet–1/2 mile (244–805 m)	5	20–50	80+
kohlrabi	*Brassica oleracea*	Brassicaceae	annual/biennial	insect	800 feet–1/2 mile (244–805 m)	5	20–50	80+
leek	*Allium ampeloprasum*	Amaryllidaceae	biennial	insect	800 feet–1/2 mile	5	20–50	80+
lentil	*Lens culinaris*	Fabaceae	annual	self	10–20 feet (3–6 m)	1	5–10	20+
lettuce	*Lactuca sativa*	Asteraceae	annual	self	10–20 feet (3–6 m)	1	5–10	20+
lima bean	*Phaseolus lunatus*	Fabaceae	annual	self or insect	160–500 feet (49–152 m)	1	10–25	50+
melon	*Cucumis melo*	Cucurbitaceae	annual	insect	800 feet–1/2 mile (244–805 m)	1	5–10	25+

Annuals or Biennials?

Annuals complete their life cycle in a single growing season

Most preferred for seed saving by home growers

Include a wide variety of vegetables

Biennials take two years to complete their life cycle.

Typically exhibit vegetative growth year 1 & seed year 2

Plants may require protection to survive winter

Examples of biennials include:

Beets	Brussel Sprouts	Swiss Chard
Cabbage	Kale	Leeks
Onions	Turnips	

Collecting Seeds

- Harvest seeds only at full maturity
- Choose from the healthiest plant(s)
- If desired, harvest based on desirable traits
- Seed collection is based on type of plant
  - Fleshy vegetables (tomatoes, cucumbers, peppers, squash)
  - Dry seeds (Deadheaded flowers, openly exposed seeds)
  - Dry pods (Beans, bok choy)

Fleshy Vegetables

Seeds with gel on them should be fermented to prepare them for saving

Fermentation:

- Mimics the natural rotting process
- Kills pathogens
- Increases the germination rate of seeds
- Used for tomatoes, cucumbers, squash, melons, pumpkins etc.
- Not used for peppers

Fermentation Steps

- Place seeds and pulp in a container
- If too thick to stir, add a little water
- Place container in a warm location (72-86 degrees F)
- Stir the mixture 2-3 times per day
- Process will typically take 48-72 hours
- Monitor seeds for sprouting –if they sprout, seeds have soaked too long
- Once gel is gone, process is finished

Fermentation Steps (cont.)

- Rinse the pulp from seeds using a strainer and pressurized water
- Rinse seeds well
- Sit strainer on a cloth and let it dry for a few hours with seeds in it
- Spread seeds onto a plastic, glass or ceramic plate (not paper towels or wax paper)
- Seeds should be in a single layer
- Dry in an airy, dry location with low humidity and not in direct sunlight
- Process takes 2+ weeks

Dry Seeds

- Dry seeds typically come from within flowers
- Sacrifice of the food product for the seeds
- Leave plant in ground until it flowers (bolts)
- Watch flowers closely for seeds to develop
- Once seeds have started to form, shake seed heads into a paper bag
- Do this daily until all seeds have been collected
- Use a fine mesh screen to separate the seeds from the feathers and chaff.

Dry Pods

- Typically beans and peas
- Leave on the vine to mature and dry
- To get seeds out of pod:
  - Split pods by hand to remove seeds

  OR
  - Fill a feed sack or pillow case with pods
  - Bang it around
  - Separate the seeds from the residual
- Most seeds of this type will change color or darken when mature

Drying the Collected Seeds

- Lay seeds in a single layer on a dry, flat surface
- Air dry seeds only – do not use heat or light
- Screens work best for air circulation
- Use fans to hasten drying process
- Temperature over 95F causes damage to seed
- If drying more than one type, keep them separated

Tests for Seed Dryness

Standard Tests:

- Break rather than bend under stress
- Shatter when hit with a hammer
- Can’t dent with your fingernail

Tomato seeds: Break rather than bend

Beans: Shatter

Lettuce seeds: Break rather than bend

A well dried seed is a viable seed

Storage

- Paper envelopes and glass bottles are highly preferred
- Plastic and glassine bags can be used as well
- Pick a location to store seeds that is dry, dark and cool
- Refrigerator and freezer storage is not recommended
- Be sure to mark containers with species, variety, date of collection and a brief description
- Helpful to include same information on paper inside of container

Proper seed storage ensures a high percentage of germination

Saving Flower Seeds

- Generally, pretty easy with flowers that reseed themselves
- Use the Dry Seed method to collect as discussed
- Flowers that you might try include:
  Calendula, Columbine, Foxglove, Globe Amaranth, Marigolds, Morning Glory, Nasturiums, Nigella, Zinnias and Sunflowers

References

University Extension Offices:

- Oregon State University
- Penn State University
- University of Georgia
- University of Maine

Seed Savers Exchange – online

www.seedsavers.org

Seed to Seed by Suzanne Ashworth

Questions?

Thank You!

For more information about our programs,
visit our website at
extension.arizona.edu/yavapai

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