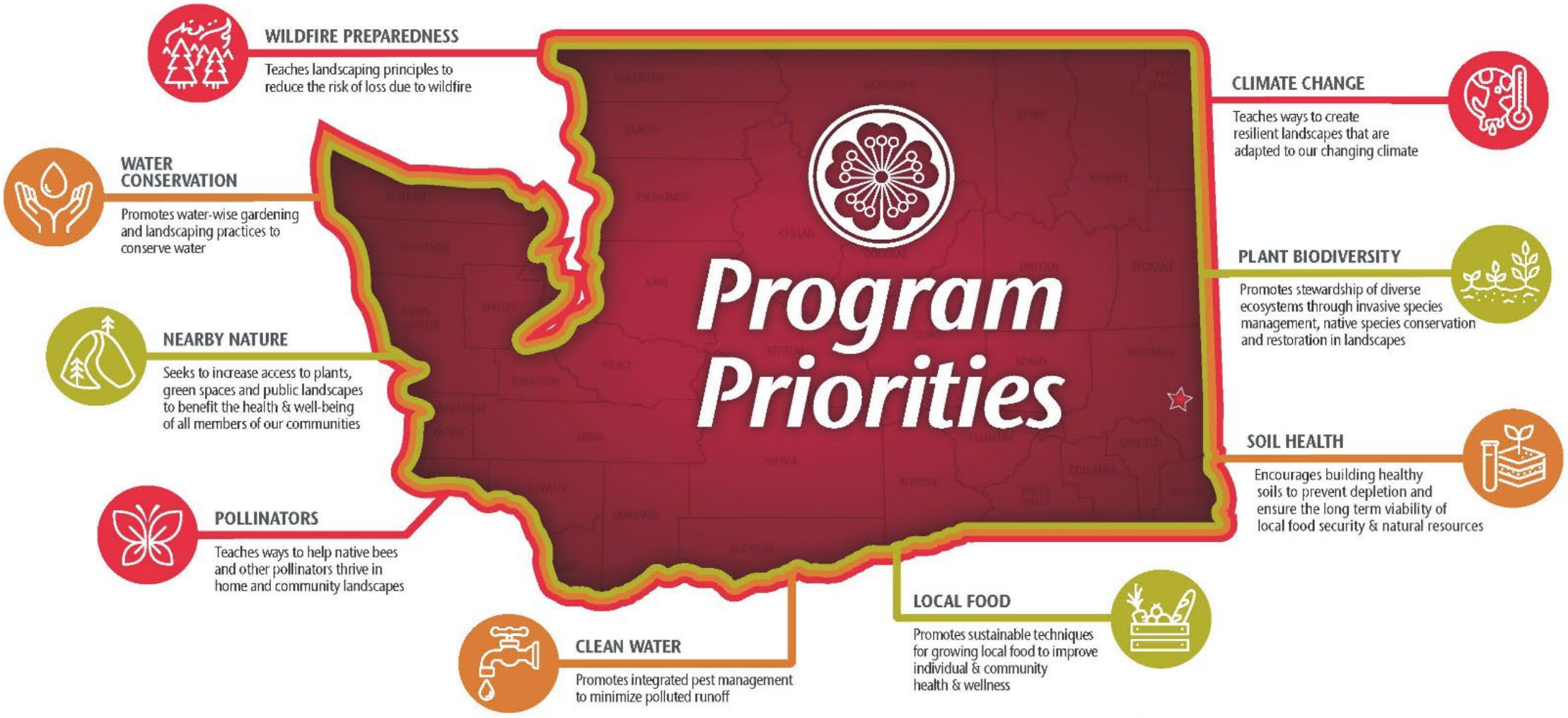
WASHINGTON STATE UNIVERSITY
LEWIS COUNTY EXTENSION

Gardening For Everyone

MASTER GARDENER FOUNDATION of Lewis County

WSU Master Gardener Program

Cultivating Plants, People & Communities Since 1973



Become a volunteer mastergardener.wsu.edu

Master Gardener Program

WASHINGTON STATE UNIVERSITY EXTENSION

SEED SAVING

WSU Lewis County Master Gardeners

Today Topics

- What are heirloom seeds
- Seed Banks
- Why should we collect seeds
- What seeds to save
- How to collect seeds
- How to store seeds
- Seed germination test

What Are Heirloom Seeds?

- **Heirloom seeds are:**
  - Open-pollinated
  - Pollinated by natural methods like insects, birds, or wind.
  - Heirloom seeds are seeds that have been saved and produced true-to-type for 50 years or more.

- **Heirloom seeds**
  - Tend to cost less than hybrid seeds.
  - Collected seeds from heirloom plants produce a new generation that's true to type.
  - Save money by collecting seeds to plant the next year.

Hybrid, F1 Hybrid, GMO Seeds

- **Hybrid Seed**
  - Controlled cross pollination
    - Male pollen of one plant
      - Transferred to female flower of a different plant
        - Collected seeds don’t grow true
- **F1 Seeds**
  - F1 – Filial1 (First Child / Generation)
  - Selecting breeding of two parent plants (not hybrids)
  - Sterile or don’t grow true from collected seed
- **GMO Seeds** – Genetically Modified Organism
  - Natural genetic code is changed
  - Resistant to pest
  - Resistant to Round Up

Why are Heirloom Seeds Preferred?

- The taste! Heirloom veggies haven’t been subjected to selective breeding that favors uniformity and their ability to be shipped cross-country over taste.
- Adaptability to differing climates and soils.
- Seed Saving costs less money than buying new seeds every year.
- Nutritional value and variety in your diet. Preserving rare varieties.
- Preserving History
  - Black Watchman Holly Hock
    - Thomas Jefferson Monticello Gardens in 1629

Shrinking Biodiversity

- The United States has lost 90%of its food plant biodiversity over the last hundred years.
- Europe has lost about 80 %.
- China – since 1950's only has 10% of rice varieties remaining
- 12,000 plants species can be used for human consumption
  - Only 150 are massed produced for world wide consumption
    - Wheat/ Maize / Rice – 50% of our total world caloric intake
- Mono-cropping more susceptible to disease and drought

The Great Potato Famine

Consider the historical lesson of the Irish Potato Famine from 1845 to 1889.

A heavy reliance on just one or two high-yielding types of potatoes greatly reduced the genetic variety that ordinarily prevents the decimation of an entire crop by disease, and thus the Irish became vulnerable to famine. In 1845 a strain of the water mold *Phytophthora infestans*, which causes late blight in potatoes (as well as tomato plants), arrived in Ireland accidentally from North America. About one million people died from starvation or from typhus and other famine-related diseases. The number of Irish who emigrated during the famine may have reached two million. Between 1841 and 1850, 49 percent of the total emigrants to the United States were Irish. Ireland's population continued to decline in the following decades because of overseas emigration and lower birth rates. By the time Ireland achieved independence in 1921, its population was barely half of what it had been in the early 1840s.

Single Selection Banana

- Over 1,000+ varieties of banana's world wide
- Gros Michael commercial banana crop
  - Died of in the 1950's – *Fussarium oxysporum*
- Cavendish yellow banana – grocery store variety
  - Currently threated by *Fussarium oxysporum*
- Honduras work to 'create' a disease resistant banana
- Gros Michael & Cavendish – Examples of mono culture farming.

A Call to Action

- Unless open-pollinated seed varieties are grown and their seeds saved, they risk extinction.
- The only choice left for the home grower (and more worryingly for the farmer) will be limited hybrid cultivars offered only by major multinational companies.
  - 4 companies control 50% percent of all seed production on the planet.
- As the German plant-breeding trust Kultursaat has commented, “We consider breeding, seed saving and varieties as apart of our cultural heritage and consider the maintenance of this heritage as a task of mankind.”
- At the very least, we have a choice to purchase seeds that are open pollinated and NOT those labeled F-1, Hybrid or GMO.

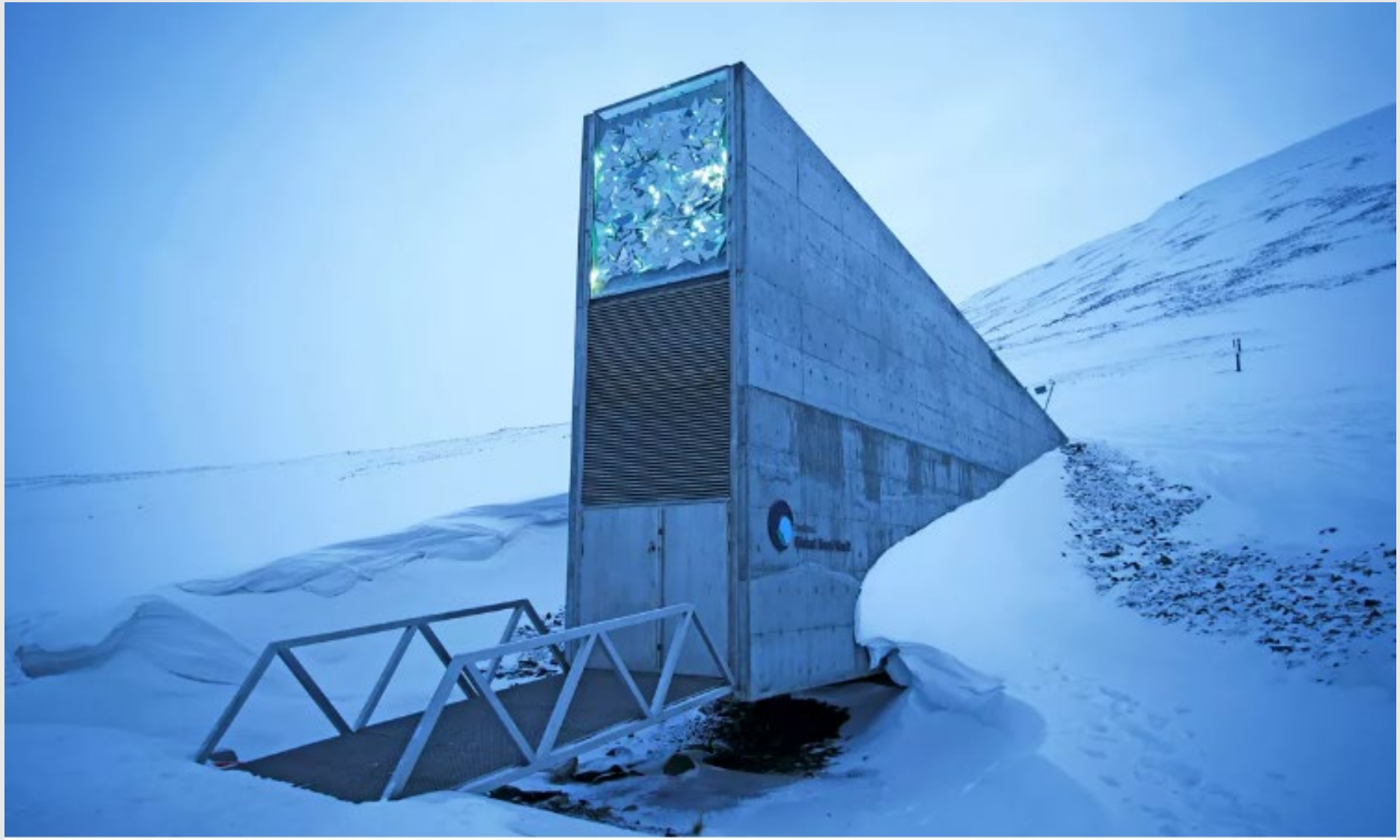
Try New Plants to Shake Up Your Garden and Add Variety, Flavor and Fun.

- If you love the peppery bite of arugula, you'll want to try "Green Spray" mibuna, a fast-growing Asian green with smooth, narrow leaves.
- Try white cucumbers for less bitterness. "Dragon's Egg" (65 days). This heirloom pumps out dozens of the 3 to 5 one-inch egg shaped fruits.
- Why grow ordinary kale? 'Rainbow Lacinato" (65 days) is a plant with gorgeous multicolored foliage and with excellent cold weather tolerance.
- Bush beans are easy to grow, quick to crop, but give pole beans a try. Their harvest goes on for months and overall production per plant is a least twice that of a bush bean. "Blauhlide" (65 days) is a delightful German heirloom that is both beautiful and supper productive, yielding 8 to 10 foot vines with pretty lavender-purple flowers followed by dark purple pods.
- You can also sign up for a CSA that focuses on "ugly vegetables". Perfectly good vegetables, but that do not make the typical grocery perfection standard, and support your local farmer!

Seed Banks

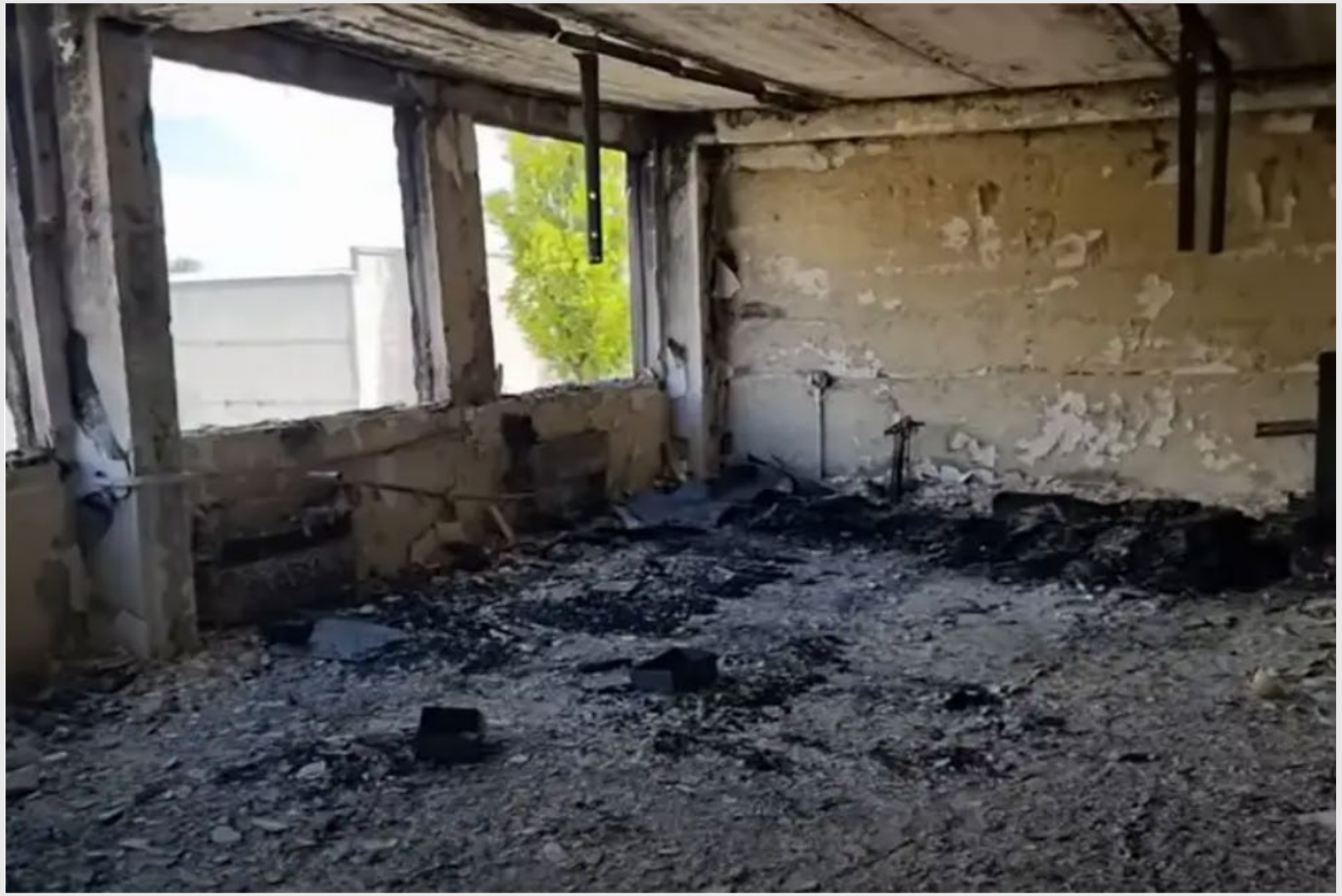
- 1,700 Gene Banks Worldwide
- Norwegian seed vault Svalbard (Doomsday Seed Bank)
  - 1,145,693 varieties from around the world
  - 4.5 Million total seed sample capacity
    - 500 seeds per sample
  - 2.25 billion seeds total
- Stored seeds – DNA to develop new strains
- Optimum temperature for storage -.04 Fahrenheit
  - Low temperature & moisture – seeds viable for decades

Svalbard Seed Vault Norway



(Image credit: Heiko Junge/NTB scanpix/Zuma)

Ukraine’s National Seed Bank –Victim of War



160,000 seed samples destroyed. May 2022

Why Should We Collect Seed?

- Economical
- Biodiversity
- Changing Climate
  - Collect seeds that thrive in your area

How Can We Help?

- Choose Heirlooms – increase biodiversity in backyards
- Heirlooms – contain genes distinct from monocrops
- Save your own seeds
- Share seeds – Seed Swap
- Support Heirloom seed companies
- Support seed-saving organization
- Local library seed swap

Resources for Biodiversity Seeds

- Botianical Research Institute of Texas
- Cherokee Nation Seed Bank
- Camino Vereda / U.S. and Peru
- Hawaii's Public Seen Initiative
- Louisiana Native Plant Initiative
- National Library for Genetic Resources Preservation
- Native American Food Sovereignty Alliance
- Native Seed/SEARCH
- Pima County Library Seed
- Seed Savers Exchange
- Southern Exposure Seed Exchange

Shrinking Biodiversity

- 12,000 plant species can be used for human consumption.
- Only 150 are cultivated in mass quantities.
- U.S. – Lost 90% of fruit and vegetables since 1900's
- Wheat / Maize / Rice – provides half of the calories we consume
- China - since 1950's only 10% of rice varieties remain.
- Monocropping – more susceptible to disease, drought.

Types of Seeds

- **Grows True to Parent Plant**
  - **Open Pollinated - OP**
  - **Heirloom seeds – OP**

- Will Not Grow True to Parent Plant
  - Genetically Modified seed (GMO)
  - F1 Hybrid

Isolation /Preventing Cross Pollination

- Eggplant, Peppers, Tomatoes
  - Blossom Isolation Method
    - Blossom Bags

When to Harvest Seeds?

- Seeds pods or fruit must be fully Mature
  - Beans, Peas, Radish
    - Fully dry on the vine
    - Seeds Rattle around
- Tomato’s
  - Fully developed and overripe
- Squash, Cucumbers
  - Yellow skin or hard skin – past eating quality
- Peppers
  - Started to shrivel on the vine

Seeds Ready to Harvest

Zinnia ready to Harvest Seeds

Beans, Peas, Pods

1. Legume pods dry on the vine	6. Weevil Prevention* - Freeze seeds for 2 days
2. Harvest the seeds	7. Air dry seeds for 1-2 days
3. Remove any damaged or invested seed	8. Place in airtight container
4. Seeds should air dry for two weeks - A paper plate or coffee filters	9. Store in cool dark place
5. Test for dryness - Thumbnail or hammer	

* Pea weevil

Radish Pods

Lettuce Seeds

Tomato Seeds

1. Fully or over ripe fruit	7. Rinse & repeat a couple of times
2. Cut in half remove seeds and some pulp	8. Put good seed onto paper plate or coffee filter
3. Place seeds in jar with lid	9. Let seeds dry for several days
4. Ferment seeds 3-4 days	10. Put seeds in airtight container with silica gel packs.
5. Add water to fermented seeds - stir	11. Store seeds in a cool place
6. Pour off water – good seeds sink to bottom	

Fermenting Tomato Seeds

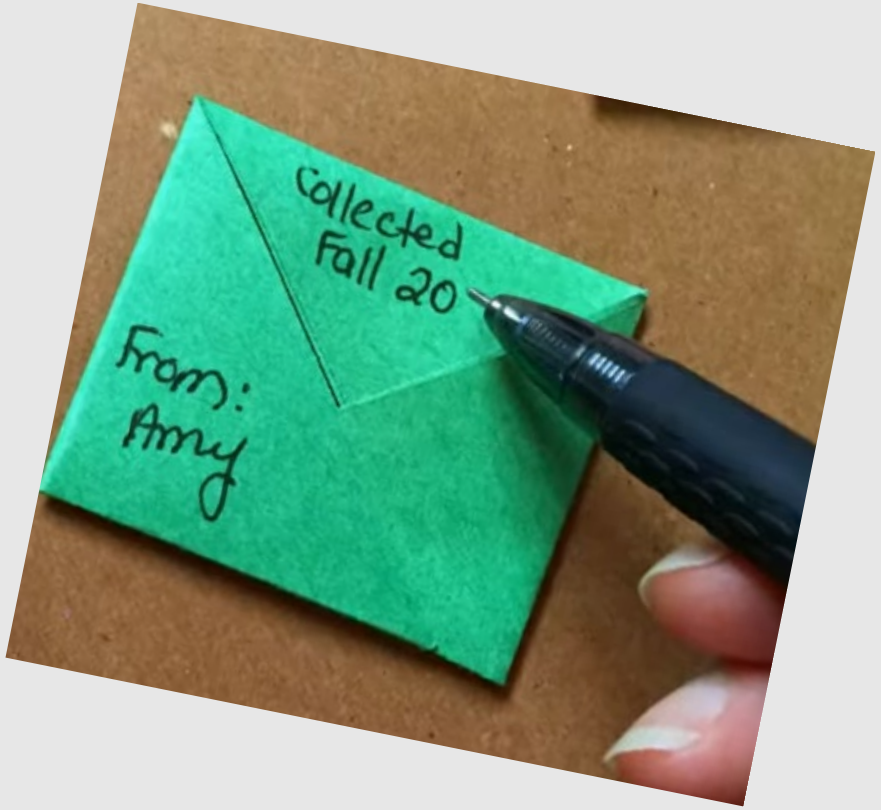
Cucurbit Seeds

1. Let fruit mature on the vine	7. Pour off pulp and floating seeds
2. Skin turns yellow or orange	8. Rinse off good seeds
3. Let fruit start to turn soft	9. Place on paper plates/coffee filters to dry
4. Harvest seeds from fruit	10. Seeds snap in ½ when ready for storage
5. Put seeds in container with water - Ferment 1-3 days	11. Store in airtight container/cool dark place
6. Add more water to container & stir	

Storing Seeds

SEEDS MUST BE COMPLETELY DRY PRIOR TO STORAGE

- Storage Containers
  - Silica Gel Packs
  - Seed Saving Envelopes
  - Prescription Bottles
  - Condiment containers
  - Daily Pill Containers
  - Spice Jars
  - Envelopes from Junk Mail
  - Baby Food Jars
  - DIY Envelopes



How Long Do Seeds Store

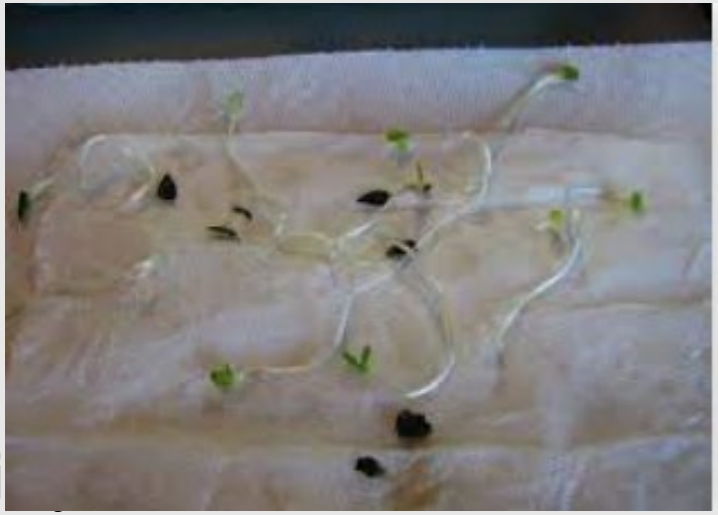
Factors

- Seed Size
  - Large & Hard seeds store longest
- Temperature
  - Cool area – Heat is your seeds enemy
- Light
  - Keep out of direct light
- Moisture
  - Keep away from high humidity areas

Germination Test

- What you need
  - Paper towels or coffee filters
  - Plastic bag
  - Pen
  - Seeds
  - Wet paper towel or coffee filter.

- Place seeds (10) on wet towel and fold up.
- Place towel inside a plastic labeled bag & seal.
- Place in a warm spot/ top of refrigerator is ideal.
- Check every few days for sprouting.
- Sprouting percentage: 10 seeds – 7sprouted = 70% viabi

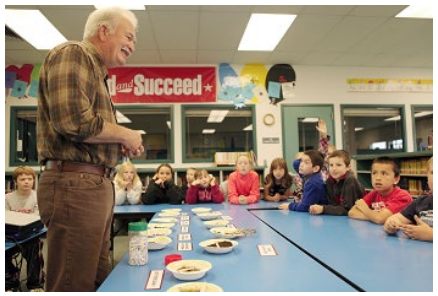


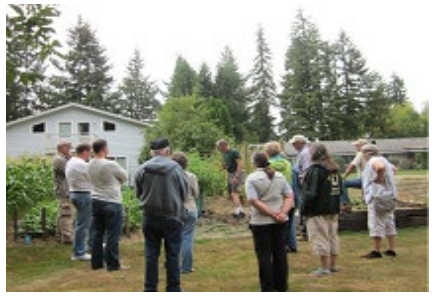
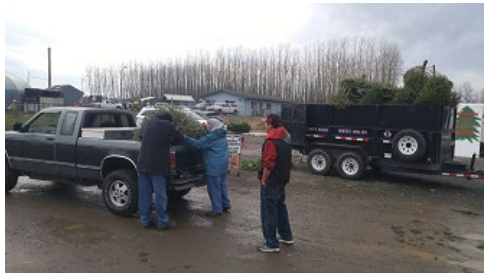
References:

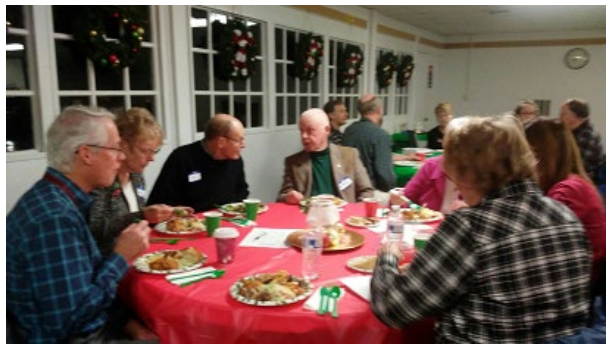
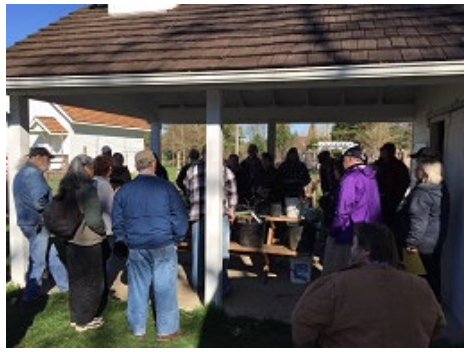
- https://www.croptrust.org/work/svalbard-global-seed-vault
- https://wellfieldgardens.org/2018/09/07/seed-storage
- www.nrdc.org – National Resource Defense Council
- https://www.seedsavers.org/
- https://www.heifer.org/blog/how-to-save-your-seeds.htm
- https://www.bhg.com/gardening/yard/garden-care/garden-seed-tips/
- https://wellfieldgardens.org/
- https://extension.oregonstate.edu/
- https://ucanr.edu/
- https://toxinfreeusa.org/

Consider Becoming A
WSU Lewis County Master Gardener!

- Community & Youth Outreach!
- Continuing Education!
- Horticultural Training!
- Social Activities and more!




Contact the Master Gardener Program Coordinator at (360) 740-1216 or jason.adams@lewiscountywa.gov or visit www.lewis-mg-mrc.org

Thank you for attending Gardening For Everyone!

WSU Lewis County Master Gardeners

17 SW Cascade Ave., Chehalis, WA 98532

https://lewis-mg-mrc.org/

https://extension.wsu.edu/lewis/

(360) 740-1216