Seed Production & Market Opportunities for Maize, Peppers, Garlic and more

Zachary Paige, North Circle Seeds and University of Minnesota Extension RSDP
Rodrigo Cala, Cala Farm …..

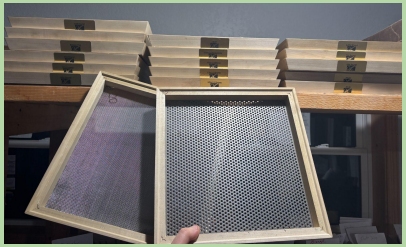
SARE Farmer Rancher Grant - An Idea

Farmers;

- Rodrigo Cala
- Zachary Paige
- Javier Garcia

Needs to get Started

- Specialized Equipment
  - For Planting
    - Corn planter
  - Drying
    - Drying Racks
    - Drying area - Greenhouse
  - Seed Cleaning
    - Seed Screens
    - Agriculex Corn Sheller



NORTH CIRCLE SEEDS

Established in 2020

www.northcircleseeds.com

Mission Statement

North Circle Seeds is committed to creating an ecologically diverse, equitable and inclusive foods system. We do this through an intentional relationship with our seeds of Midwestern growers who produce organically grown, regionally adapted seed.

Circle of…

- Life - Season to Season, Year to Year, Generation to Generation
- Growers - Community
- Sustainability, and our Food System
- Relationship with our seeds

TRUE Sustainability!

We can't have a food system without healthy Seed.

Seed BASICS

1. Where to start:

   Open-Pollinated vs Hybrid Seed

2. Annual vs. Biennials

3. Pollination, Population & Isolation

4. Harvest & Cleaning.

Hybrid

- Are varieties resulting from Pollination between genetically Distinct parents.

- Seed is a hybrid

If the seed packet has written on it:
Hybrid
F1
VF

- Hybrids will not produce plants like The parent plants. They could be Sterile or produce a majority of offspring
Unlike themselves because they are Genetically unstable.

Heirloom – Open Pollinated

- These are varieties that have been Grown for so many generations that their physical and genetic qualities are relatively
Stable.

- This is the result from the pollination Occurring between the same or genetically
similar parents

- *Not Hybrid*

Seed is Abundance!

One Corn Seed will produces → 600-800!

One cherry tomato seed will produce → 18,000 seeds!

One lettuce seed can produce → 500+ seeds!

One cucumber seed can produce → 2500+ seeds!

One ground cherry seed produces → 20,000 seeds!

One basil seed produces → 3000+ seeds!

One eggplant seed produces → over 5000 seeds!

Existing Infrastructure and Market

North Circle Seeds Assets include;

- Specialized growing equipment
  - Isolation cages
- Root cellar
  - Underground Seed and Biennial Plant Storage in ideal conditions for longevity
- Specialized cleaning and marketing equipment
  - Seed screens
  - Winnow Wizard
  - Seed packets, printers, website and printing materials
- Expertise
  - Seed Germination Testing Protocols
  - Selection, breeding strategy of crop production
  - Knowledge/Access of publicly available seed sources

New Equipment

- 4 Row Corn Planter (Javier) - For planting White Corn
- Drying Racks (Rodrigo) - For drying garlic and peppers @ Cala Farm
- Seed Screens (Zachary) - For cleaning pepper and other small seed @ North Circle Seeds farm
- Agriculex Corn Sheller - (Shared use @ Javier's Farm in Long Prairie) - For shelling food grade corn.

White Corn

Corn - Seed Saving Considerations

- Wind Pollinated, Isolate ¼ mile from other corn
- Drying Rack - keep constant airflow - check humidity
- Agriculex Corn Sheller - has Rubber rollers, keeping kernel integrity ideal for food and seed saving

Agriculex - SCS2

SCS-2: Single Corn Sheller

Single Ear Corn Sheller

Features:

- Little to no seed carryover through careful design
- Can Handle a very wide range of ear shapes and sizes without changes
- Minimal kernel damage with rubber-covered shelling rollers
- Designed for efficient use by a single operator
- Clean operation thanks to suction-type seed cleaner with zippered bag for dust collection

Data	
Length (mm)	800
Width (mm)	700
Height (mm)	1320
Motor	3/4 HP

White Corn - Value Added Products - Tortillas

Nixta

Wet Grind

Press

Cook

Store

White Corn - Cost Analysis

Equiment	4 row Corn Planter	Tine Weeder	Corn Sheller	Total
Depreciation cost				
Cost	$4,000	$4,000	10000	
Salvage value	500	500	3000	
Useful life	15	15	15	
Annual Depreciation	$233.33	$233.33	$466.67	933.33

Direct Costs	Amounts
Seed	10 lbs @ $20/lb = $200
Fertilizer	$200
Fuel	$70
Labor	40 hours = $400
Subtotal	$870

Total ½ acre Growing Cost - Approx $1800

Corn/Tortillas - Cost Analysis for ½ acre

Profit to sell to tortilla producer
Yield - 1200 pounds clean corn
Marketed at $2/pound = $2400

Tortillas
10 Pounds corn = 100 tortillas
Direct sales - $10 / 10 = $100/ 10 pounds
Value Added - $10 / pound

Direct Costs	Costs
Wet Grinder depreciation (300 for 15 years)	20
Calcium Hydroxide	20
Griddle depreciation (200 for 20 years)	10
Labor	20 hours = $200
Totals	250

Hardneck Garlic!

Hardneck Garlic

How to Grow Garlic Video @ www.northcircleseeds.com
More Seed Saving Videos to come
with the University of Minnesota Extension
https://extension.umn.edu/planting-and-growing-guides/saving-vegetable-seeds

Growing Garlic - Enterprise Analysis

Direct Costs	Amount	Cost
Starter Seed	*$25/lb x 300 lbs = 12,000 head*	*7500*
Fertilizer	800 lbs poultry Manure	520
Mulch	150 bales x $5/bale	750
Labor	$10 / hr x 200	2000
Total Costs		3270

Yield	Amount per Pound	$$$
Total Yield	Approximately 1200 Pounds	$18,000
Seed saved for next year	300 Pounds	7500
Sell 485 lbs as seed	25/lb	12,125
150 pounds to grocery	7/lb	1050
Bad (diseased) Garlic - Throw away	200 lbs	0
Grade B Garlic	80 lbs	160

Garlic
Value Added Products

Garlic Salt - Enterprise Analysis

Garlic Salt Expenses	Quantity	Cost
4 oz Jars	200	$200
Dehydrator	1	$300
Grinder	1	$300
Salt	25 lbs	$100
Grade B Garlic	80 lbs	$160
	total	$1,060
Garlic Salt Sales	200 @ $8/jar	$1,600

Peppers
Serrano, Jalapeño, Chile de Arbol

Peppers and Chiles

- “Promiscuous” selfers so separate different varieties by at least 50ft.
- Isolation by caging if needed or by space.
- Population size 10+
- Plant 18-24” apart for seed
- Loves high temperatures during flowering and fruit set.
- wear gloves when harvesting hot pepper seed!!!
- 1-3 oz per plant of seed!
- $35 per oz commercially

Peppers - Enterprise Analysis

Direct Costs	Amount	Cost
Seed	500 seeds	$50
Trays/starter soil	80	80
Transplanting Labor	20 hours	200
Cultivating Labor	40	400
Subtotal		730

Pepper Caging

Peppers - Seed Saving Tips

- Isolation - by 250+ feet, or by caging. Strategy - Plant pollinator plants surrounding each variety
- Dry in dehydrator with no heat
- Thresh and crush seeds from dry peppers and separate.

Peppers - Value added Product, Hot Sauce

Fermentation

Pit Boss Smoker

Smoked Peppers

Chipotle Hot Sauce

Value Added Products - Shared Production Kitchen

Flowers - Marigolds

Seed Enterprise Economics

	Southern Exposure Seed Ex *Virginia* (certified or not)		Fedco Seeds *Maine* (certified or not; pays 10% less for conventional)		High Mowing Seeds *Vermont* (certified only)		Baker Creek Heirloom Seeds *Missouri* (certified or not)		Sow True Seed *North Carolina* as of 2017 season (certified or not)	
Crop Type	Lbs needed	$/lb	Lbs needed	$/lb	Lbs needed	$/lb	Lbs ne	$/lb	Lbs needed	$/lb
Amaranth			0.5-4 lbs	$50-$100				$45-75	1-2 lbs	$80
Beans, Cowpea	10-400lbs	$4 - $15	30-300 lbs	$3.50-$7.00	500-3000	$3.00-$5.00	50+	$8	10-150lbs	$12
Brassicas	1-10lbs	$60-$120	5-8 lbs	$70-$80				varies	3-15 lbs	$55
Collards	1-10lbs	$60-$160	20 lbs	$60	25-100	$35.00-$45.00			3-15 lbs	$55
Corn	10-1000lbs	$6-$8	50-500lbs	$6.50-$10.00	500-2000	$9.00-$12.00	50+	$8-10	25-200lbs	$25
Rare Corn	2-30lbs	$10-$20						$12-15	15-50 lbs	$25
Cucumbers	3-30lbs	$50-$60	5-20lbs	$40-$65	25-300	$25.00-$45.00		$55	1-8lbs	$60
Eggplant	0.25-10lbs	$320-$560	1#	$300-#400	2-10	$150.00-$350.00		$320	1/4 -1lb	$480
Lettuce	0.25-10lbs	$60-$160	2-30lbs	$50-$80	10-100	$50.00-$70.00		$240	1-5 lbs	$320
Melon	1-10lbs	$60-$80	3-12lbs	$50	50-200	$25.00-$50.00		$60	1-5lbs	$55
Okra	5-60lbs	$30-$32						$30	5-15 lbs	$55
Onion										
Peas	10-500lbs	$4-$8	50-300lbs	$3.5- $7	500-5000	$3.00-$3.50		8	25-150lbs	$3-$10
Peppers	0.25-10lbs	$320-$560	.5 - 3lbs	$200-$350	3-10	$200.00-$350.00		$480- 120	1/4 -1lb	$480
Squashes	3-50lbs	$50-$60	25-50lbs	$25-$50	50-1000	$15.00-$50.00		$55	2-15 lbs	$55
Tomatoes	0.25-10lbs	$320-$560	0.5 - 3lbs	$280 - $360	2-10	$300.00-$350.00		$350	1/4-1lb	$480
Flowers	1-5lbs	$80-$320	1-10 lbs	$50-$150		$30.00-$100.00		$10-400	1/2-10lbs	$20-$200
Herbs			widely varied	widely varied				varies	1/2-10lbs	$20-$200

Nature & Nurture Seeds *Michigan* (certified or not)		Seed Savers Exchange *Iowa* (certified or not) $/lb depends on variety as well as production method; Lbs needed is a typical range per variety that we need in any given year. Contact SSE for updated list.	
Lbs need	$/lb	Lbs needed	$/lb
Pandemic has changed this info, we're still figuring it out	$100	1-3l	$50-$100
	$9-$15	100-1,000	$6-$15
	$50-$160	10-30	$50-$90
	$100-$160	5-30	$35-$75
	$14	200-5000	$4-$14
	$25	100-200	$14-$20
	$72	10-120	$20-$50
	$160	1-5	$100
	$80	20-80	$60
		20-60	$20-$35
		10-20	$100
	$20	200-2000	$4-$10
	$490-$640	1-5	$300-$500
	$40-$65	10-500	$60
	$490-$640	1-15	$300-$400
	varies	1-5	varies
	varies	1-30	varies

North Circle Seed Economics of Pepper/Corn Seed

Pepper Seed

- Approx 400 - 500 plants of jalapeno of pepper will produce 1lb seed
- Pepper - 350 / lb - 80,000 seeds per pound.
- 40 seeds per packet - 2,000 packets x $4 = Potential $8,000

North Circle Seed Economics of Corn Seed

- Approx ¼ acre = 500 pounds selected seed
- 75 seeds = approximately .8 ounce - 20 packs per pound, $4/pack, $80 per pound for small packs.

Flower - Marigold Seed

- Approximately 100 seeds per packet, 1232 packets per pound, $4/pack approximately $5000 per pound of seed.
- 1200 - 1500 plants to get a pound of seed.

Seed School - Oct 25-27th, 2024

3 Day Seed Saving Weekend on North Circle Seeds Farm

- Grant from West Central Initiative through Sustainable Farming Association
- Train the Trainers on intensive Seed Saving Techniques

Why be a part of a regional Seed Keeping network?

- Increase resiliency of our local seed system, regional specific crops
- Increase seed/plant/food diversity
- Profitable enterprise for local/regional growers
- Close the loop of Sustainability and limit inputs (save $ by not buying seed)
- Grow together, eat together, bring community together – learn from each other. Learn about diverse cultural foods from our neighbors.
- Tell our seed and food stories with our local community
- Provide seed to local/regional gardens (community, school, housing)
- Others reasons?

It takes a community!











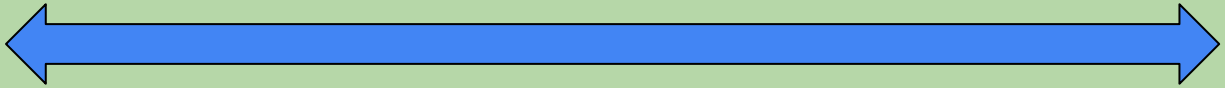







Mating Systems

(Sexual Reproduction)



Selfers

Self-fertilization

Outcrossing prevented

All genes inherited from one parent

Very well adapted to a specific niche

Tomato, bean, pea

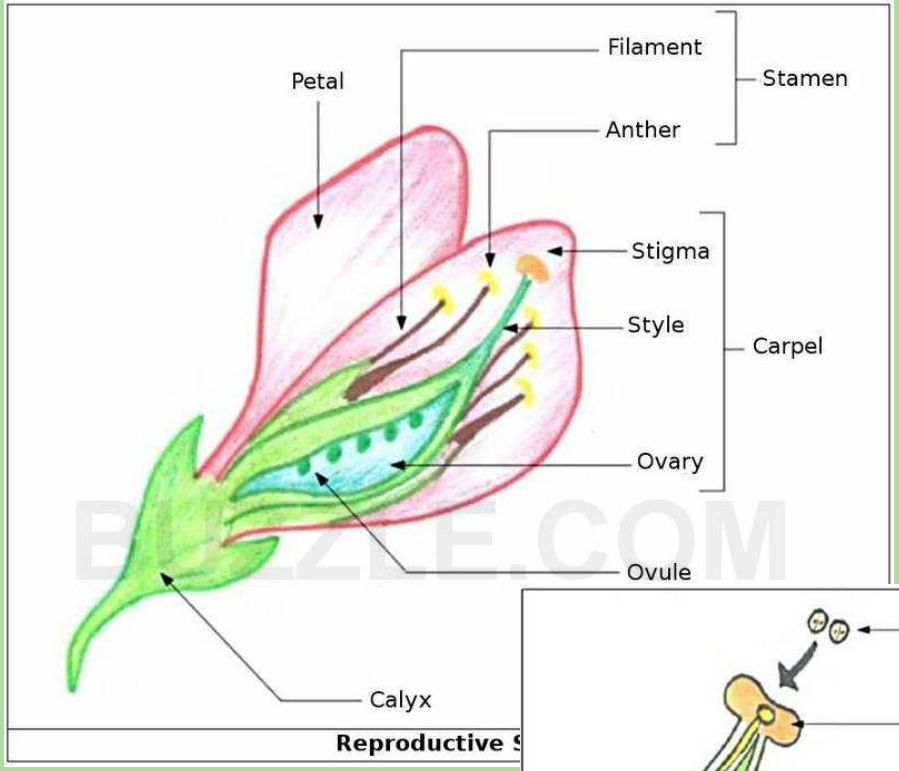
Outcrossers

Cross-pollination-
From wind, insects

Offspring are a mixture of genes from two parents

Can adapt to changing environments

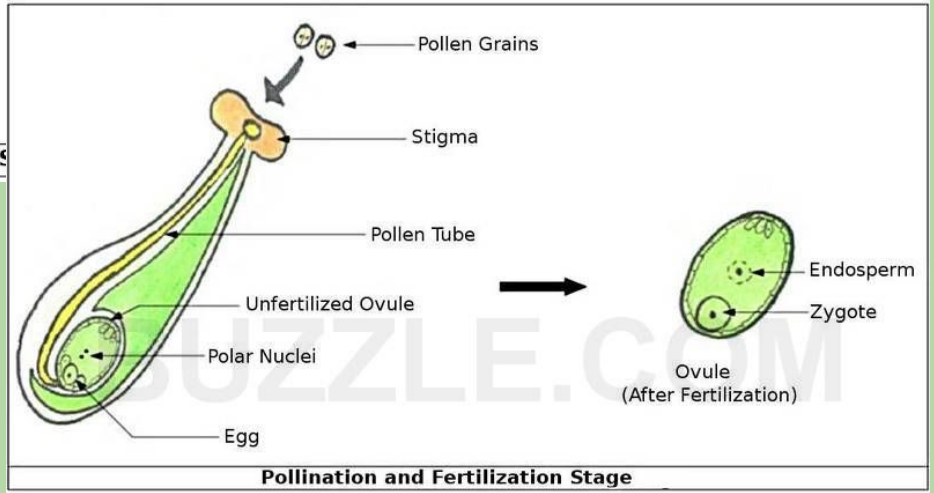
Squash, corn, cabbage



Common Beans Flower:
Phaseolus Vulgaris

The flowers are
Bisexual,
Complete,
Perfect

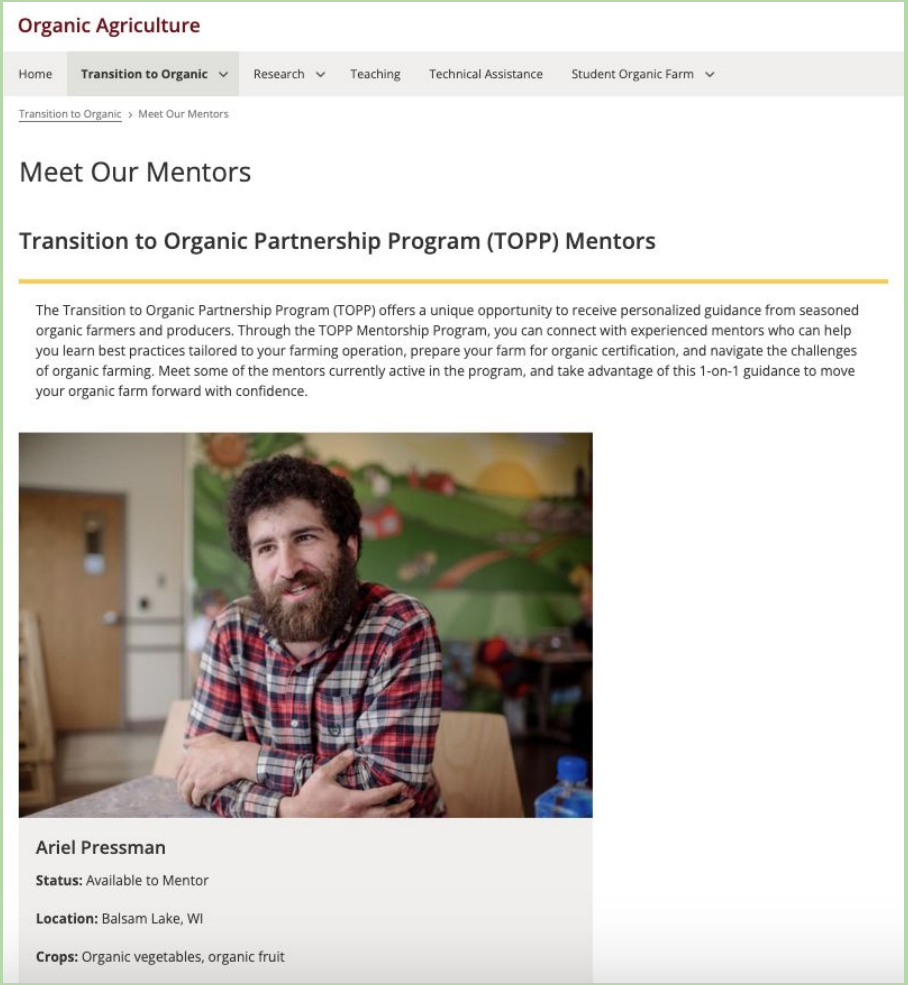
They have sepal,
pedal,
stamen and pistal



Minnesota TOPP Program

- Organic Transition Mentor/Mentee Program

- New Organic Website - https://organicag.umn.edu/



Seed Cleaners for small scale production

Winnow Wizard
Wide adjustable range of wind speeds for seeds of all types.
Relatively inexpensive (2k - 3k)

Old grain cleaners
Find screens that work for your needs

Have you saved seeds?

Let's name a couple!!

And if so, why?
And If not, which one are you interested in?

Isolation Options

- Distance
- Species
- Time
- Barriers
- Pollinators
- Use Pollination bags or cages
- Hand pollination

Seed Dryers

Build your own seed dryer. Used for drying down post- harvest.

Make sure dryer has the following components;

- Dry in a naturally low moisture/warm environment
- Seed is in porous containment; on screens, mesh bags
- Air Movement; Fans, crack windows if drying in building
- Heat – space heater
- (Dehydrator)
- Check it! – moisture meter
  - Down to 12% moisture or lower

Seed Storage

Cool, Dark and Dry

- Temp in F + Humidity % < 100
- Before sealing seeds in a jar or plastic bag, make sure it is dried down!!
- Choose space to store seeds that is cool and has minimal temperature fluctuations!

Three steps you can do after drying down seeds to store:

1) Put seeds in paper bag (or packet)
2) Throw in silica gel packets
3) Seal container or jar

Questions?

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