



## Sourcing Medium-Scaled Equipment for Canadian Seed Producers

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January 2017*

Canada's ecological seed growers are often looking for tools and equipment to suit a scale of production in between the needs of the backyard seed saver (who might use kitchen utensils suitable for very small batches), and the large-scale industrial seed producers (who use much more expensive, heavy duty machinery). Producing at this "in-between" scale means growers are often looking for older, used equipment; modifying existing tools and equipment to suit their unique needs; or inventing and experimenting with new medium-scale machines. Talking to fellow seed farmers is a great way to learn about their trials and errors, and sometimes procure designs that have worked for them. While there may be many great solutions and plans out there, it's often hard to know where to look, or with whom to talk to find the right machines for the job.

Below you will find links to seed production equipment for a medium-scale, including:

- [Harvesting](#)
- [Drying Down](#)
- [Threshing](#)
- [Screening](#)
- [Seed Cleaning](#)
- [Winnowing](#)
- [Wet Seed Extraction](#)
- [Storage](#)
- [Seed Testing](#)
- [Other Resources](#)

Along with a brief description of the tool, you will find—if available—designs for building it yourself and/or places to purchase it. The websites referenced may also provide videos or photos that explain how to use the tool. The list is meant to help medium-scale producers find the right tools to get a job done, as well as to help smaller scale producers scale up their seed saving operation by locating key pieces of equipment. We recognize that some of these links reference costs that may be out of reach for some producers. Some medium-scale farmers have overcome this by creating shared seed tool sheds, acquiring grants or loans, or have started local seed equipment rental programs. Likewise, some of the DIY links may require some serious carpentry or engineering skills. We've aggregated this list to provide diverse options for different kinds of equipment – we hope it's a good starting place.

These resources came from talking to seed growers and doing online research. While thorough, the list is not totally exhaustive. We would love to hear about equipment you are using, modifying, or building so that we can continue to update and improve this reference document! If you have a suggestion, please email Steph Hughes, Regional Coordinator for Atlantic Canada, at [seed@acornorganic.org](mailto:seed@acornorganic.org).

## HARVESTING

Item	Use	DIY	Purchase
Hand Held Seed Harvester	For collecting seeds from perennials, native plants, and/or plants in ecological sensitive areas.		<a href="#">Prairie Habitats Hand Held Seed Harvester</a>  <a href="#">Farmshow.com's simple Hand Held Seed Harvester</a>
Cutterbar (or Sickle Bar)	Cuts crops and leaves them in place. These can then be windrowed if desired, and then picked up with a combine.		Local farming newspapers, Kijiji, <a href="#">Commodity Traders International</a> , or farm auctions are all good places to look.
Combine (either pull-behind or one machine)	For harvesting, threshing, and screening your crop all at once. Suitable for a large acreage of one seed crop. If harvesting a diversity of crops, a combine may actually cost time due to cleaning required between seed lots.		Local farming newspapers, Kijiji, <a href="#">Commodity Traders International</a> , or farm auctions are all good places to look.

## DRYING

Item	Use	DIY	Purchase
Tray Dryer or Drawer Dryer	A cabinet with drawers or trays for laying out seed. A fan draws warm air around the seeds to dry them.	<a href="#">Multi-purpose Dryer</a> from this <a href="#">FAO website</a>  Dan Brisebois of <a href="#">Tourne-Sol Farm</a> has a forced air dryer made from a fan that pulls air through a stack of screens, contained within cloth bags.	<a href="#">Drawer Dryer</a>
Silica Gel Dryer or Charcoal Dryers	Substances that absorb moisture from the air can act as seed desiccants. When sealed in a container with moist seeds, desiccants will dry the air, in turn drying the seeds. Seeds shouldn't directly contact the desiccant.	<a href="#">Silica gel dryer</a> and a <a href="#">Charcoal dryer</a> from Kew Gardens/Millennium Seed Bank Partnership.	For example, <a href="#">Uline Silica gel</a> .

## THRESHING

The process of separating the seed from the plant.

Item	Use	DIY	Purchase
Corn Sheller	Used to remove kernels from corn cobs	<a href="#">Fast Maiz</a> <a href="#">Nehrig's Corn Sheller</a>	<a href="#">Decker Corn Sheller</a> <a href="#">Seedburo Walnut/Corn Crank Sheller</a> <a href="#">Almaco ear corn sheller</a>
Threshing Box	A container with abrasive material on the bottom, used to manually separate small batches of seed crops by hand or foot. If "dancing" on delicate seed, soft-soled shoes are preferable. You can use hands or a wooden cement float to move the crop around the box.	<a href="#">2 x 3 foot wooden box</a> . Thin wood strips attached to solid bottom provide extra abrasion. A car floor mat in a bin. <a href="#">Friction Thresher</a> (can be seen in this <a href="#">video</a> )	
Box Thresher or Treadle Thresher	A box with a rotating drum inside, turned either by hand crank or treadle pumped by foot.	<a href="#">Rodale Thresher</a> <a href="#">Homemade wheat thresher</a> with raised staples on drum to provide extra abrasion. <a href="#">Open Source Ecology DIY treadle thresher</a> . <a href="#">Easy Digging</a> has a list of threshers with photos and videos.	
Bucket Thresher	A 5-gallon bucket, rod, and small section of chain are attached to an electric drill to separate seed crop.	<a href="#">Homemade Bucket Thresher</a>	
Belt Thresher	Two electrically	<a href="#">Lawrence's</a>	New threshers, like

	powered belts run opposite one another over seed crop to separate.	<a href="#">Homemade Belt Thresher</a>	the <a href="#">LBT-2 from Agriculex</a> can be pricey.  Medium-scale seed producers have overcome this by creating <a href="#">seed equipment rental programs</a> like the Organic Farm School where you can rent an <a href="#">Almaco Thresher</a> for \$40 for a 48-hour period.
Rotary Thresher	Metal flails break up the crop material and release the seeds. Remember to modify the RPMs based on the seed size to avoid splitting the seed.	<a href="#">Modified Wood Chipper Thresher</a> open source plans from I-Tech.	
Stationary Combine		<a href="#">Modified "junk" combines</a>	<a href="#">Allis Chalmers All Crop Harvester</a> is a stationary combine that some seed producers are using.  Also, look at local farming newspapers, Kijiji, <a href="#">Commodity Traders International</a> , or farm auctions.

**SCREENING & SEED CLEANING**  
Based on size.

Item	Use	DIY	Purchase
Screens	Use to manually separate seeds from weeds/chaff/other seeds based on size. Screens may keep desired	Search thrift/dollar stores to assemble a set of colanders, deep fryer baskets, and sieves—different shapes and sizes of holes will suit different seed types.	<a href="#">Seedburo Hand Testing Screens</a> (large square screens) and <a href="#">Seedburo U.S. Testing Sieves</a> (round, stacking sieves)

	seed on top, letting other material fall through, or allow desired seed to fall through, keeping other materials on top.	Build your own screens with <a href="#">these designs</a> from <a href="#">Seed Savers Exchange</a> .  To guide your efforts, <a href="#">The Seed Garden</a> contains an appendix with a list of seed screen sizes for different crops.	Hoffman <a href="#">Hand Screens</a> and <a href="#">U.S. Standard Sieve Series</a>  <a href="#">Screens from Strictly Medicinal</a> have higher sides which are better suited for larger volumes.
Hand-operated Screen Seed Cleaner:	Sifts using springs to make hand-screening easier.	<a href="#">Open source design</a> from I-Tech.	
Fanning Mill or Air-screen Seed Cleaner	Uses sieves to sort by size and a fan to remove chaff from threshed grain/seeds.		The “ <a href="#">Micro 180</a> ” from Crippen Northland Superior Supply Company  <a href="#">Almaco Air Blast Seed Cleaners</a> & <a href="#">Clipper Office Testers</a>  The <a href="#">Clipper Pacer Manual Seed Cleaner</a> or <a href="#">Clipper 334</a> are often used by medium-scale seed producers. Often these models can be bought used.
Grain Pre-cleaner	Augers move the grain over screens, removing weed seeds, cracked and small kernels, based on size. This can increase the grade of the grain.		<a href="#">Kwik Kleen Grain Cleaners</a> . Company offers <a href="#">clearance pricing</a> on older models, and used equipment options

**SEED CLEANING**  
Based on shape or weight.

Item	Use	DIY	Purchase
Gravity Table	Separates seeds by weight. Removes empty seeds, insect- damaged seeds, stones, and other lighter or heavier materials from the seed lot.	<p>Cory Eichman at <a href="#">Saugeen River CSA</a> uses a modified drafting table that he can adjust and tighten to the right angle. Boards attached to the sides prevent seed from rolling away, and a piece of eavestrough is attached at a slight angle on the bottom to catch the seed.</p> <p>Beth and Nathan Corymb of <a href="#">Meadowlark Hearth</a> use a square made of 2 x 4s, covered in a canvas material. The canvas is held at an angle, and seeds placed at the top end. Round seeds fall while twigs and chaff stick to the canvas, to be brushed off by hand.</p>	<p><a href="#">Oliver Manufacturing</a> offers new gravity tables but there are also older models by this company out there that can be purchased used. <a href="#">This video</a> shows a refurbished Oliver model.</p> <p>Local farming newspapers, Kijiji, <a href="#">Commodity Traders International</a>, or farm auctions are all good places to look.</p>
Spiral Separator	Using gravity, sorts for round seed types against flat or oblong seeds. For example, removes split seeds and weed seeds (triangular bindweed or flat grasses) from cabbage or soy.		<p><a href="#">Seedburo</a> Spiral Separators</p> <p><a href="#">Profile Industries</a> Single or Double Open Spiral Separators</p>

## WINNOWER

Separate seed from chaff using air current, based on weight/density.

Item	Use	DIY	Purchase
PVC Tube Air Columns	Separates seeds from chaff using air	<a href="#">I-Tech Small Electric PVC Winnower</a> <a href="#">WSU Seed Cleaner</a> <a href="#">BC Seeds' Air Separator called "Suckie"</a>	<a href="#">Hoffmann's Oregon Seed Blower</a>
Hand-operated Seed Winnower:	Separates seeds from chaff by blowing the less dense chaff away as seeds fall.	<a href="#">I-Tech Design</a> Mark Luterra's <a href="#">Winnow Wizard</a> (a.k.a. the Precision Laminar Flow Winnower, from <a href="#">Wild Garden Seeds</a> .)	
Gravity Separator/ Air Column Seed Cleaner	A traditional zig-zag aspirator design combined with a "swirl chamber" to allow repeated sorting of each seed as it is poured through. Requires shop vac.	Real Seeds, in the UK, has published this <a href="#">open source design</a> .	A Swedish-made version, <a href="#">BBC Gravity Separator</a>

## WET SEED EXTRACTION

Over-ripe fruit is macerated in order to remove the seed from the fruit in which it is encased, and separated with water.

Item	Use	DIY	Purchase
Wet Seed Extractor	Separates flesh from seed in wet-seeded crops (i.e., peppers, cucumbers, squash, etc.)	<i>The</i> <a href="#">Liberty 5000 Wet Vegetable Seed Extractor</a> was one that Tom Stearns at <a href="#">High Mowing Organic Seeds</a> had custom built.	<a href="#">AGE manufacturing millet wet seed separator</a> For those transitioning to large-scale production, wet seed extractors can be imported from <a href="#">Rickrock Manufacturing</a> in California.
Dybvig	Cleans both wet- and		<a href="#">Dybvig Seed Cleaner</a>

Seed Cleaner	dry-seeded crops. Often used for tree and native seed crops.		
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### STORAGE

Item	Use	DIY	Purchase
Scales	To track seed inventory, accurately fill packets, mail out packages, etc.		<a href="#">Canadian Weigh</a> scales <a href="#">Staples'</a> mailing scale <a href="#">Uline</a> shipping scales
Hand-operated Vacuum Packing System	To facilitate the storage of dry seeds. A sealed container prevents re-hydration of seeds, thus extends their viability. The reduced oxygen content suffocates adult insects that are stored with the seeds, and also extends the viability of the seeds by slowing down the seed respiration rate.	<a href="#">I-Tech Vacuum Packing System</a>	

### SEED TESTING

Item	Use	DIY	Purchase
Germination chamber	To assess the quality of your seed it is important to do a <a href="#">germination test</a> on all seed lots.	<a href="#">Broadfork Farm's DIY Germ Chamber</a>	<a href="#">Agratechnik Seedburo</a> Germination Paper <a href="#">Anchor</a> Germination Paper
Seed Testing Standards	<p>The Canadian Food Inspection Agency (CFIA) has a lot of information on <a href="#">seed testing procedures and standards</a>.</p> <p>Though created for pedigree and commodity seeds, the info is relevant and applicable to vegetable seed producers too.</p>		



## RESOURCES

Though the equipment listed above was not taken from these books, any small to medium scale producers will benefit from these resources to refer back to the best practices of seed saving.

- [The Seed Garden: The Art and Practice of Seed Saving](#). Jared Zystro, and Micaela Colley, edited by Lee Buttala and Shanyyn Siegel.
- [Seed to Seed](#). Suzanne Ashworth
- [The Organic Seed Grower](#). John Navazio
- [How to Save Your Own Seeds. A handbook for Small Scale Seed Production](#). Seeds of Diversity
- [Breed Your Own Vegetable Varieties. The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving](#). Carol Deppe
- [Small Scale Organic Seed Production Handbook](#). Patrick Steiner
- [Organic Seed Production and Saving: The Wisdom of Plant Heritage](#). Bryan Connolly