

Workshop Title: Seed Cleaning Equipment & Sources Relative to Your Scale of Production

Speaker: Kim Delaney

Executive Summary:

Delaney gives an overview of the harvest to cleaning process for seeds from the small grower operation to the larger size growers. Special treatment for wet seed threshing. Then a short summary of cleaning by size and weight.

Detailed Notes:

Harvest Equipment

- Hand Harvest is for the small scale seed grower and they use buckets, bins, blades, bags, scissors etc.
- The next step up is a machine harvest <http://www.prairiehabitats.com/> basically a modified weed wacker and great for grains and flower seeds or brassicas and costs under \$400.
- Pull-type sweep harvester www.seedburo.com and <http://www.prairiehabitats.com/>
- Pull-type combine for dried beans – PTO driven, Allis Chalmers \$2,500-\$8,500
- Combine - \$250,000 plot combine is for larger operations.

Threshing Equipment

Threshing equipment for separating the seed from the plant.

- Simple tool, made out of two pieces of wood – in Will Bonsall's *Essential Guide to Radical Self-Reliant Gardening* book. Worked mostly with beans.
- Stomped beans or brittle pods and stomp on them. Can use a metal tray with car mat with trowel and inexpensive to make.
- Build threshing boxes – grate over a box and use hands to break pods against the grate. Google for looking for plans.
- Corn Threshing – decker corn shellers \$7-10 – split the sheller over the dry corn cob and push through
- Corn/Walnut sheller \$289 www.Seedburo.com or www.southernexposure.com
- or Almaco Ear Corn sheller \$24,000 and is electric
- Drill and Bucket thresher or paint mixer attached to the bucket (google thresher designs) Grain in bucket and put washer and put paint mixer in and start up the drill.
- Threshing peas in the field – snowmobile ramp cross manure wagon and thresh peas as they went on the ramp and went into the plastic.
- I-Tech modified wood chipper shredder grain thresher – medium scale – creating a grain thresher \$50-\$3,000 to build. One need to modify the hammer – take the sharp side off and switch to the dull side. Flipping the blades. Also modify the RPM:
 - 250-400rpm for beans and large seeds
 - 400-800rpm for coriander, radish, sunflower
 - 600-1400 for wheat, oats etc.
- Typical threshing rates – amaranth 66, bok choy 22-30, oats 94, pinto bean 117, soy bean 81-127
- Large – portable belt thresher new \$10-\$15,000 – pulls seeds out of pods.

All-Crop stationary field thresher and runs off PTO tractor Allis Shalmers, don't make them but you can buy them used.

Wet seed threshing/cleaning

Tomatoes, cucumbers, melons.

- Slice and squeeze out – use bucket/bin with screen (wire mesh) to keep the skin from going in. Tomatoes and cucumbers should be fermented – usually 1-3 days to have gel

sac removed since it has germination inhibitors. Mimicking nature. Pour through strainer and decant what is left. Then dry on a plate.

- Melons – slice in half and scrape out and remove the pulp.
- Food processor for small to medium wet seed threshing. Use dough blade and duct tape sharp blades – dump fruit in.
- Millet wet vegetable seed separator under \$4,000 AGE Manufacturing info@agemfg.com for peppers. Use of water, screens, and bucket system. You get some pulp and seed and fill bucket with water and decant it. Use pulp to make salsa since it is so clean.
- Big – thresher wet seed – tomato seed extractor in use at Johnny's Select Seeds and liberty 5000 from High Mowing Seeds.
- Tomato Flume for large scale wet seed cleaning for major poundable of tomatoes.

Cleaning – by size and weight

- Use of screens and hardware cloth and deep fryer baskets are great.
 - Hoffman Manufacturing hoffmanmfg.com and seedburo.com. They have sales and will sell just screens for \$8-\$40
- Screen theory - Top screen removes the larger debris bottom screen retains seed and allows fine debris to fall through
 - <http://www.atferrell.com/clipper/products/clipper-office-tester> for common screen sizes for seed by type
 - also *The Seed Garden: the art of and practice of seed saving* from Chelsea Green
- 1/20 screen round holes 1/2th of an inch in diameter and 11/64 screen 11/64 x 3/4 screen
 - it is a slot or oval shaped holes that in dimension is 3/4
- Clipper office tester clean small lots of seed \$2,400-3,000
- Small model clippers – pacer or manual seed cleaner is pedal-powered and conversion kit and 50 bushels/hour
- Clipper 334 – 3 screens \$15,000 US 120-150 bushels/hour

By weight or gravity (air or wind)

- hand held hair dryer with cool setting
- air compressor
- fans of all sizes
- shop vac
- air columns
- gravity table
- Winnowing seed with any type of fan – Thresh seed in a bucket and pour into a bucket or second bucket or trap based on weight. Pour out of a square bucket instead of a round bucket more uniform. Pour seed in front of fan but put a box around the fan.
- I-Tech design small electric winnower <http://members.efn.org/~itech/>
<http://itras.ucdavis.edu/files> inexpensive anyone can make
- WSU Seed Cleaner <http://vegetables.wsu.edu/NicheMarket/WSU-SeedCleaner.html>
- Real Seeds Air Column www.realseeds.co.uk Based on a dresser. Hawthorn Farm version uses these plans. Build for well under \$400 and all dust goes into the shop vac.
- Gravity Table \$46,000 laboratory size gravity separator.
- Spiral Lab separator Profile Industries – will separate healthy seeds from non-healthy.

Other items – magnifying lens and masks are used to review the seeds.

Drying

- Ambient temperature: 3-10 days
- Seed drying under cover: plastic greenhouse or hoop house (sides up for air flow turn seed regularly)
- use of a tarp house and use on ground tarps for the floor to keep seed off ground
- dry using additional heat above wood stove – squash seed on screen above wood stove. 2-3 days to dry. Squash are quick to mould.

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- Stacking shelves with fan. Pallet made of plastic and built wooden boxes on top with screens and covered or use cotton bags in boxes and use of a fan on top of boxes. Rodent proof.
- Tray dryer
- Walk in seed dryer made of a shipping container, exhaust fan, heater and shelving cost \$3,000

Question: What about using a dehumidifier?

We use in a storage room rather than in drying. Good to dry corn in a hurry. Also for drying garlic.

Question: What about Cold or longer term storage?

Don't do long term storage. In UK there is a drum drying kit with silica and hydrometer and seed banks for long term to a certain level of dryness and store.