

Workshop Title:

Stock Seed

Speakers:

Laurie McKenzie, PNW Research and Education Associate, Organic Seed Alliance

Executive Summary:

The speaker outlines different methods to maintaining the careful preservation of organic stock seed. The speaker explained different concepts necessary for understanding how seeds are graded for quality, followed by an explanation of the different standards for seed. She continued by explaining different regulations for seed, and how more should be introduced for organic seed. The speaker also explained the importance of purchasing good quality seed.

Main Notes:

- What is stock seed?
 - Highest quality seed to ensure genetic purity
 - Her definition: Carefully maintained, used to produce commercial lots of seed
 - Used to produce commercial seed
 - Sometimes referred to as Breeders' or Foundation Seed
 - Maintained by the breeder or a seed company (negotiable)
 - Ex: Grower that grows for own production as well as commercial seed. Commercialized by selling to a company called High Mowing, and they can sell it commercially. Or, you can negotiate and ensure that High Mowing always comes back to you in a contract.

- Seed companies will work with you – if you have a question just call. They need to meet their needs and they want a win-win situation. If you want to maintain the stock seed, you can negotiate that to maintain own stock seed
- Genetic purity: percentage of contamination by seeds or genetic material of other varieties or species. Genetic purity of any commercial agricultural product propagated by seed begins with the purity of the seed planted
 - 4 Elements of Genetic Purity (% by weight):
 - Crop Seed - % of Mixture
 - Non-crop Seed – different variety than target crop
 - Weed Seed – both noxious and not (extremely important!)
 - Noxious is an invasive species. Will vary by state
 - Non-Seed – soil, debris, chaff, etc.
 - Comes from sample
- US Federal Seed Act (FSA) 1939
 - Regulates interstate shipment of agricultural and vegetable seeds.
 - Must be labelled and truthful
 - Point: People know what they're buying, and what's transported across state lines
- FSA is enforced by Crop Improvement Associations
 - Noxious weed control
 - ALL seed labelled and tagged, inspected in field
 - Subjected to lab testing for disease and genetic purity analysis

- Weed seed percentage also applied to field production.
 - Ex: threshold is 2%, can only have 2% in the field as well as in final clean product
 - There are NO Crop Improvement Associations or equivalents for Organic Agriculture in the US
- Challenge in Organic: No certified seed framework for Organic.
 - Comes into play when there is contracted production of licensed varieties
- FSA Regulations may have to be followed in Organic Agriculture
 - Must follow State guidelines for stock seed production
 - Ex: Seed company that produces a licenced seed from a University breeder must follow state guide lines for stock seed production
- Classes of Seed
 - Breeder Seed – source of all classes of classified seed
 - Foundation Seed – Progeny of Breeder or Foundation seed produced under the control of the originator
 - Registered Seed – progeny of breeder or foundation seed produced according to policies and procedures of a regulatory body to maintain genetic purity and identity of a variety. Some crops have no registered class.
 - Certified Seed – progeny of Breeder, Foundation or registered seed produced according to procedures
 - Applies mainly to field crops and conventional farming, not necessarily all vegetable crops because they're not registered varieties.

- Ex: Barley may be named, potatoes, etc. are registered while with vegetables most varieties are not registered. May have to deal with volume according to the speaker.
- Bag Labels include:
 - Name, Variety of Seed (%)
 - Lot #
 - A lot number is traceability. Internally, producer comes up with the lot number mainly to track issues. Company can trace your bad seed to where it was produced.
 - Origin.
 - Question about where it is from: For example, if a person bought a bag of seed from Vermont, but it was grown in Italy. Where do I say the origin?
 - Speaker says wherever the seed was produced
 - % Weed seed
 - % Inert Matter (non-plant)
 - Germination Rate (variable depending on crop) – must be done within the last 5 months
 - % Hard seed
 - Slide with example is provided by the speaker
- Seed Genetic Purity Standards are set by state laws and seed certification agencies ensure quality seed
 - Genetic purity tolerance levels are determined by:

- Biology (Self, cross pollinated)
 - Variety type (pollinated or hybrid)
- Genetic purity of seed planted must equal or exceed the final product
- Gen Purity decreases with each subsequent generation of propagation
- Early Generations such as Breeder and Foundation seed have stricter standards for purity
 - Slide with an example of germination standards provided by the speaker
 - Speaker considers these numbers in the example fairly low. Some are 50%, some are 70%. Very variable by crop
 - High Mowing Organic Seed: Stock seed germination must be 5% above the Commercial contract minimum in order to ensure that growers are set up for success.
 - Also, the High Mowing gives graduated bonuses when seeds come back over-germed
- Purity and Disease Management are the most vital components of quality Stock Seed Production
 - Know your seed borne diseases
 - Be familiar with acceptable treatments for non-seed borne diseases
 - Seed borne is inside seed, Non-seed borne remain on seed coat that can be treated with bleach or hot water treatments that are very specific (temperature and time) to kill disease but not harm seed

- Can talk to a seed company about this. Ask what they are planning to test for, do they do hot water, etc.
 - Manage and control weeds – know your noxious weeds
 - Tightly manage any potential genetic contamination
 - Previous crop weeds, wild relatives, compatible species in nearby fields,
 - Strict roughing of off-types
 - Field visits are usually required
 - Carefully harvest and clean to avoid contamination
 - Know the source of your stock seed! Don't hesitate to ask questions about testing, diseases, etc.
 - Ask questions about origins
 - Make sure you know what you are bringing onto your farm!
- Genetic Drift
 - Random change, can affect your crops
 - Natural Selection favours reproductive traits,
- Rouging is important
- Stock Seed can be produced
 - Frequently – allow variety to evolve and adapt
 - Infrequently – best for minimizing genetic changes
 - Growing a bunch of stock seed, sort of freezes it in time
 - Speaker recommends getting to know your grower to gain trust

- Seed storage
 - Cool, dark, dry
 - Minimum fluctuation of temperature and humidity
 - Heat and relative humidity need to equal 100 or less
 - Airtight containers with dry seed
 - Protection from pests
 - Underground storage is ideal because its consistent
- Take home lessons from High Mowing Seeds:
 - Awareness of IP Protection or Licence Issues
 - ALL ABOUT TRUST and RELATIONSHIP with the grower
 - Field visits are essential
 - Easy for stock seed to get contaminated (genetically and physically)
 - Biggest concern is seed borne disease so know where they are
 - Do as much preliminary testing and knowledge seeking as possible
 - Ask testing, treatment, etc. to front load your knowledge
 - OP Stock Seed can be taken off the top of commercial production
 - Best growers call them with observations and questions
 - They never give stock seed contracts to new growers
 - Seed company bears disease testing expenses
 - Ex: communities that are quarantined and tested, company will spend thousands to ensure no disease

- They are always looking for new stock seed growers (only about 5-10% of their growers are stock seed certified)
- Question period at the end
 - To do breeding trials, where should I gather my material for this? Wanting to start with really good genetics.
 - Speaker: Reputable seed companies that are used by a lot of growers. Source outside what you already know. For example, Tozier out of Europe. Access genetics that do not already exist in the US. Get your hands on everything you can and do trials
 - What about UV treatment for disease?
 - Speaker does not know much about it
 - Crowd member explains that testing is being done right now
 - Speaker explains that in higher temperature and higher humidity, the seeds are using their resources, so the lower the temperature and lower the humidity, the longer they store.
 - If you could choose between slightly warmer year round, and one was slightly warmer then slightly colder, which would you choose?
 - Speaker recommends the changing temperature based on instinct
 - Crowd member says that it depends on how drastic the change is, the more drastic, the worse it will be
 - If harvesting something indeterminate all season, will it be different or same lots?

- If testing is done, and the results are consistent, then they could be the same lot