

**2017 ACORN Conference & Trade Show
Best Western Glengarry - Truro, NS**

Workshop Title:

Quality Assurance Practices for Vegetable Seed Crops

Speaker:

Mel Sylvestre

Executive Summary:

Mel talks about the definition of seed quality. Different methods for testing seed quality and their discrepancies are explained. Mel details germination testing, seed lot purity, vigour, and varietal maintenance.

Continuation from “Canada’s Seed Regulations: What do Vegetable Seed Producers Need to Know” by Mel Sylvestre.

Detailed Notes:

Mel has worked on the University of British Columbia (UBC) farm for 6 years. This farm utilizes 7 acres for food production, which sustains a community-supported agriculture (CSA) program, 20-30 restaurants, and 3-4 weekly markets. Researchers are involved with the farm to analyze variables such as percent yield. Students are also present at the farm every day to learn through different educational programs related to food systems, agro-ecology, agro-science, etc.

Personal battle for Mel:

Mel would like to build a bulk commercial vegetable seed network in Canada. Canadian vegetable seed producers usually sell seed packets, not bulk seed. That’s why the vegetable seed regulation in Canada is not so refined. In order to build this network, how do you identify quality?

Specific regions are more ideal for growing certain crops - vegetable seed crops included. In order to diversify seed crops, they should be grown in different regions and climates, especially grown in the regions and climates where the vegetable seed will be planted. 60%-80% of spinach vegetable seed crops are grown in one state in the USA, which is not ideal for when the seed is transported to be planted in a different climate. This change in climate/region may affect that seeds germination rate and therefore its quality.

Germination test:

These tests can be completed at home or in a laboratory. The type of testing (home or lab) depends on the scale of the farm and how many varieties the farm grows. Laboratory testing would be too expensive for a small scale CSA farmer because if

each germination test costs \$35, and the small scale CSA farmer has 70 varieties to test for, it becomes too costly.

When is seed counted as being viable (aka when the germ of the seed exits its seed coat and begins to grow)? When the germ is about 3 times the size of the seed is when the seed can be counted as viable for the germ test. However, this is a general rule of thumb and farmers set their own standards. The key is to be consistent with standards. The shelf life of seeds is species dependent.

When completing a germination test within the home/farm, a rolled up germination paper or a Petri dish works well for germination tests. When the germination paper is rolled up and put into a container upright with a little bit of water in the container, it can be easily transported around because many germination tests can fit into the one container upright. Mel does her germination tests as soon as the seeds come out of the field, due to demand.

Not many seeds require dormancy to be viable but there are ways you can break dormancy by:

Scarification: breaking the seed coat.

Stratification: putting seeds in cold chamber.

Canada #1 requires a minimum germination rate of 80%. This is the regulation that larger, commercial Canadian seed companies use.

Seed lot purity and size:

Seed lots contain weed seeds, debris, and other seeds, which can pose altercations for germination tests and thus will affect quality. When carrying out a germination test, an unbiased sample needs to be taken. If a sample is cleaned and used for the germination test and results in a germination rate of 95%, a consumer that buys the seed packet may only get an 80% germination rate due to the debris that is within the seed packet.

Care needs to be taken during all stages of growing the seed. Some fungal and bacterial diseases are more prominent during certain life stages than others. If you think you have a disease, the best idea is to grow it out. It is cheaper to send a live plant sample in to be tested than to do a germination test once the seed is harvested.

What happens when you have a seed that might have a disease, but when the seed is grown it does not show any signs of disease in that specific species? What if it does show symptoms or have more drastic symptoms in other varieties? What if the disease spreads to those other varieties? Even though with the crop you have, it does not show signs now. Should you be transparent with the customers buying your seeds? What are your personal standards for this situation? What would the effects of your diseased seed be on other bioregions? If you are transparent, you will likely not have any purchases. Instead of selling your diseased seed commercially, should you instead sell

to home/hobby gardeners since their livelihood isn't at stake? Should you scrap your crop? ... These are questions you are faced with as a vegetable seed grower.

Vigour:

How do we test vigour? Vigour (good health and physical strength) can be tested by the germination test, cold test, accelerated aging test, etc. Ex. vigour can be tested as early vigour in flats.

Varietal maintenance:

Maintain good quality seed by positive and negative selection, population size, isolation distance, etc. A crop of 80 plants is a general population size for variety vigor, however, 80 plants of parsley would yield enough seed for Atlantic Canada (likely an exaggeration). In the case of parsley, should you grow the amount of plants necessary to yield good seeds? If you decide to plant a smaller population size and harvest to save the seed, even if your variety is really good, every year it declines. Will you then either plant more one year to build vigour or buy direct from a supplier instead of saving you own seed?

Option to maintain vigour with smaller than required population size:

Remove the individuals from your crop that have traits that you do not want to see genetically so these individuals do not cross pollinate and more onto the next generation. Or, select the best seed crops from the planting for yourself to plant the following year, however this lowers the population size.

Post-harvest:

Reduce the time between harvesting and processing in order to limit the amount of time pathogens have to infiltrate the harvested crop (good storage).

Record keeping:

Traceability and accountability are very important, especially when organically certified. Always record harvest dates, distances, comments (etc.). Mel's research includes collecting records from farmers to see how their crop grows compared to the information listed on the seed package. Mel uses this information to help define seed quality when working towards creating a vegetable seed network in Canada. First hand farmer experiences in the comments section that explain why they have decided to use different grow methods for the seed than what the package says is valuable information.

Summary:

How do you assure your seeds for quality?

- Germination tests.
- Check seed lots for purity/size.
- Observe for pathogens.
- Good field practices.
- Vigour testing.
- Good post-harvest practices.

- Proper storage.
- Keep good records.
- Grow your own seeds.
- Have others grow your seeds and get them to give you feedback.
- Develop a quality assurance program for your seed company.