



Online Certificate in Organic Vegetable Seed Production

January 20th to May 24th, 2020

Instructor:

Kathy Rothermel of Kitchen Table Seed House
Patrick Steiner of Stellar Seeds

E-learning Course Host:

Canadian Organic Growers <http://www.cog.ca>
Course login: www.moodle.cog.ca

Introduction to the course of study:

This 3-course, 18-week COG certificate offers a comprehensive intermediate curriculum in **Organic Vegetable Seed Production**. The certificate is delivered in an online, blended-learning format that includes live and recorded online instruction with instructors and guest experts. The bulk of this course will focus on intermediate topics, however an introductory topic, *Organic Farming Practices and Introduction*, must be completed by students prior to the beginning of the course. The course topics will include *Organic Seed Production and Harvesting*, *Organic Seed Quality Assurance*, and the *Business of Organic Seed Production*. A final, advanced topic, *On-Farm Organic Plant Breeding* will be available for students to complete at the end of the course, if they choose.

Estimated Weekly Time Commitment: 4 to 8 hours but will vary by student

Students are required to purchase textbook on their own.

Required Textbooks:

- The Organic Seed Grower: A Farmer's Guide to Vegetable Seed Production, John Navazio (\$50)
- Breed Your Own Vegetable Varieties: The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving, 2nd Edition, Carol Deppe (\$28)



The course of study includes:

Module	Sub-module	Learning Objectives
1.0 Organic Farming Practices Introductory Lesson and Review Must be completed prior to course start on January 20	1.0 Course Introduction	No learning objectives
	1.1 Defining organic farming practices	<ul style="list-style-type: none"> - Define organic farming practices according to the principles of Canada’s organic regulations - Explain what organic certification involves describe core concepts and best practices in organic farming
	1.2 Transitioning land	<ul style="list-style-type: none"> - Recognize requirements for transitioning and to grow organic seed - Understand alternative farmer-led definitions
	1.3 Agronomic performance of seed crops	<ul style="list-style-type: none"> - Examine the agronomic performance of seed crops across a variety of growing conditions
	1.4 Available seed types	<ul style="list-style-type: none"> - Discuss the different types of seed available to organic growers
	1.5 Seed saving in organic farming	<ul style="list-style-type: none"> - List the reasons for seed saving in organic farming explain how seed crop biology, environment, and management practices influence seed yield and quality
2.0 Organic Seed Production and Harvesting January 20 to March 29	2.0 Seed production and harvesting	<ul style="list-style-type: none"> - Identify the different purposes of commercial seed production and how commercial seed production differs from vegetable production
	2.1 Botany and plant reproduction	<ul style="list-style-type: none"> - Describe the pollination process, including identifying the sexual organs of a flower and seed development - Define the various pollination mechanisms: self, insect and wind - Describe the degrees of self/cross pollination in different species - Define monoecious and dioecious plants identify factors that affect pollination – including temperature, wind, pollinator pressure, weather

2.2 Basic genetics and seed saving	<ul style="list-style-type: none"> - Describe the different genetic structures of inbreeding vs outbreeding plants - Explain genetic variability - Define inbreeding depression and self-incompatibility - Explain vertical vs horizontal resistance and its relevance to plant breeding and seed saving
2.3 Strategies for producing seed for biennials	<ul style="list-style-type: none"> - Define biennial species - Describe the seed-production process for biennials, including field and indoor storage and vernalization
2.4 Isolation through crop choice and variety selection	<ul style="list-style-type: none"> - Identify the major elements of Plant Taxonomy – with an emphasis on genus, species, cultivar and variety - Describe the importance of knowing the botanical latin names for crop species and cultivars/varieties - Describe the factors that influence crop and variety selection: eg. choosing crops and varieties appropriate to your region/growing conditions; size of growing area; isolation methods to be used; length of growing season; crop maintenance requirements - Describe isolation based on plants' pollination patterns, - Identify different isolation methods.
2.5 Planning for seed crop isolation that reflect appropriate minimum populations	<ul style="list-style-type: none"> - Define the elements of an effective seed crop plan. number of crops; plot size and spacing - Create a seed crop plan that includes an analysis of surrounding crops that could cross-pollinate; minimum populations; isolation methods – distance, time, species, caging, bagging, hand-pollination; creation of barriers; pollination attractors/distractors.
2.6 Identify common disease risks	<ul style="list-style-type: none"> - Identify regional diseases that can affect your seed crop - Describe the three classes of plant disease - Describe organic methods of disease prevention and control
2.7 Factors that affect selection choices	<ul style="list-style-type: none"> - Contributing seed to the next generation - Adapting a variety to your geographic region - Producing seed for Stock seed or for production
2.8 What factors impact when and how to harvest	<ul style="list-style-type: none"> - Identify the physical indications of seed maturity - Describe the harvesting requirements for different crops - Identify the most appropriate drying and cleaning methods for different seed crops

	2.9 Techniques for cleaning different seed types	<ul style="list-style-type: none"> - Identifying wet seeded and dry seeded crops - Describing the cleaning methods for dry seeded crops - Describing the cleaning methods for wet seeds and removing flesh
	2.10 Equipment options for harvesting and cleaning seed	<ul style="list-style-type: none"> - Determine equipment needs based on scale of production - Research Build-it yourself seed cleaning equipment options for cleaning seed crops
3.0 Organic Seed Quality Assurance March 30 to April 12	3.0 Module Introduction	No learning objectives
	3.1 Define varietal purity characteristics	<ul style="list-style-type: none"> - Describe the elements that constitute seed purity
	3.2 Define seed lot characteristics	<ul style="list-style-type: none"> - Define what constitutes a seed lot and seed lot purity - Describe how to maintain seed lot purity during seed crop cleaning
	3.3 Isolation distances for maintaining purity of genetics	<ul style="list-style-type: none"> - Define required isolation from GE crops
	3.4 Specify healthy population sizes to ensure seed vigor	<ul style="list-style-type: none"> - Identify the population sizes required for seed crops to ensure quality seed.
	3.5. Evaluate conditions that negatively affect seed storage	<ul style="list-style-type: none"> - Describe the factors that cause seed dormancy - Describe proper germination procedures to ensure accurate and high quality germination results - Describe factors that affect seed storage negatively
	3.6. Assessment factors that demonstrate early seedling/plant vigor	<ul style="list-style-type: none"> - Describe the difference between germination testing and testing for vigour.
	3.7. Identify ways to disclose seed quality information	<ul style="list-style-type: none"> - Describe the most common method for conveying seed quality information to customers.
4.0 Business of Organic Seed Production April 13 to May 10	4.0 Module Introduction	<ul style="list-style-type: none"> - Outline the key components of a business approach to selling seed crops.
	4.1 How seed can be brought to market	<ul style="list-style-type: none"> - Describe the prime target markets for a commercial organic seed crop - Identify the most appropriate target market(s) for your seed crop, based on an analysis of the pros and cons of each relative to your current situation and seed crops.
	4.2 Market trends	<ul style="list-style-type: none"> - Describe methods to gather information on market trends relating to target markets.

	4.3 Budgets for various crops and scales of production	<ul style="list-style-type: none"> - Describe the purpose of budget development and profitability with seed crop production - Describe the Economic Enterprise budget approach, its benefits and applications for seed crops - Identify the key variable and fixed costs in an Enterprise seed crop budget - Define “opportunity costs” in economic budget development - Be able to determine Profitability of seed crops
	4.4 Seed Selling as a Secondary Revenue Source/Integrating seed production and diversity into an existing operation	<ul style="list-style-type: none"> - Demonstrate how seed saving can fit into a farm plan where seed sales are not the primary source of revenue. - Analyze the implications of integrating seed production and seed diversity into an existing farm operation.
5.0 On-Farm Organic Plant Breeding <i>Advanced Lesson, Concluding Webinar</i> Students will have access to Moodle until November 2020	Module 5.0 Module Introduction	- Understand and be able to identify how the skills and knowledge acquired in commercial seed crop production are transferable to open-pollinated plant breeding.
	Module 5.1 – The Current Context for Organic On-Farm Plant Breeding	Identify the goals and purposes of breeding new and/or improved varieties of open-pollinated vegetables suited for organic agriculture. <ol style="list-style-type: none"> 1. Describe the key role of selection in open-pollinated plant breeding and the two most common selection methods – mass selection and family selection – with the advantages and disadvantages of each. 2. Define Participatory Plant Breeding and its benefits 3. Outline the major initiatives currently underway in Canada and the U.S. in open-pollinated plant breeding and identify resources for pursuing further information on these.
Final Assignment May 11 to May 24	Finalize Organic Farm Seed Crop Plan	No learning objectives

In addition, learners will develop a seed growing plan over the duration of the certificate, based on the needs and attributes of their particular growing region.

An optional 40-hour in-field practicum placement is also offered to support learning with a mentor on a farm. The certificate's subject experts have contributed to a practicum guidebook to steer the learning and reporting of this practicum. This practicum exercise is an important and distinctive offering which brings practice-based learning to the online learning format.

Online resources and interactive media elements of COG's certificate include:

- A knowledge repository built for and by learners
- A video repository of instructional materials and learner contributions from their farms and growing regions
- Online polls and quizzes
- Written submissions (250-500 words/1-2 pages)
- A variety of self-directed learning activities
- 7 Webinars
- Downloadable reading materials rich in graphics and images
- Social media channels by which a virtual community of learners is built
- Synchronous instructional chat sessions with teachers and mentors
- Text books and other print resources

Technical requirements:

All courses require Internet service of sufficient quality to view online videos and interactive media. The digital media used in COG's courses have been selected considering low data requirements. Learners can also acquire lessons in a self-organized group setting by regional meet-ups in local libraries or schools.

Courses require the use of COG's GoToMeeting conferencing service. GoToMeeting is an easy-to-use conferencing system that can connect up to 50 participants in an online group meeting. Users can share screens, chat together, and speak to the group by either a computer microphone (VoIP) or by a telephone toll-free number. Your instructor will issue a log-in link for each session. Students may wish to gather in-person with other learners in their region for these online meetings.

Technical support: Contact COG at 1-888-375-7383 or email education@cog.ca