

## You Can Grow Seed on Your Farm

### IT'S EASIER THAN YOU THINK

A COUPLE OF GENERATIONS AGO, all of this would have been obvious to farmers, but these days growing seed is a very separate enterprise from growing vegetables and cut flowers. Let me tell you about how I realized it didn't have to be this way when I accidentally wound up with my first big seed harvest.

In the summer of 2002, I was working on a small farm located in the West Island of Montreal. One day while I was doing the rounds tending to crops that we were no longer harvesting, I came upon an arugula planting that had been forgotten in a far corner of the field. And when I say forgotten, these arugula were way past any value for salad greens. These plants were four-foot-tall bushes with brown seed pods and no leaves. I got off the tractor and squeezed a few of these pods. They shattered easily and released orange, red, and brown seeds. I could see that this whole planting was packed with mature seed.

I wondered whether I could collect some of the seed. I cut the plants at the base with secateurs and stuffed them in some old feed sacks. I then stashed the feed sacks in the equipment shed and forgot about them.

At the end of season, we were cleaning up the farm and shutting things down for the winter. Alison, the farmer I was working for, handed me the arugula sacks: "I think these are yours."

I brought my feed sacks of brittle arugula plants home to the kitchen and decided to see what I could do with them. I took handfuls of broken branches and pods out of the bag. The pods seemed empty. I figured the heavy seed had sunk to the bottom of the bag. The top three-quarters of the bag's contents wound up in the compost pile.

Then I emptied the feed sack into a couple of salad bowls. I twirled the bowl in a circular motion. The ensuing whirlpool brought the chaff and remaining pods to the top. I skimmed these off in handfuls to reveal a mass of seeds beneath. This was probably clean enough to reuse on the farm but the seeds still

had a lot of chaff mixed in. I wanted these seeds to look like they came out of a new envelope.

At the time, I didn't think to use a box fan to winnow out the light bits. Instead, I poured a pile of seeds onto a baking sheet. I tilted the sheet to the left—the seeds rolled to the left leaving some of the chaff behind. I wiped the chaff away. Then—tilt to the right. The seed rolled to the right. I wiped more chaff away. I repeated the process over and over. The seed got cleaner and cleaner.

My big harvest was about a pound of arugula seed. At the time this was more seed than I knew what to do with. I gave some to friends, I traded some with other seed savers, and three years later, when I started farming at Tourne-Sol, this was the arugula seed we used.

Twenty years later, I'm still working with the descendants of that seed at Tourne-Sol Co-operative Farm. This is the arugula we put in our weekly vegetable baskets and this is the arugula we put in seed packs and sell through our online store.

This was not a complicated process. And I bet it would work well on your farm.

Here are a few lessons hidden in that arugula story:

First, there was no extra bed preparation or weeding for this seed crop. All that work was done anyway for the vegetable harvest. So these bed-feet had already paid for themselves and the work to grow them. (A bed-foot is a one-foot-long slice in your growing bed.) Though leaving arugula plants in the ground to go to seed means you can't use the same space for a second market crop, the financial value of that seed crop might be comparable to a second market crop, especially with those reduced expenses.

Second, even though I had limited seed experience, the arugula that grew from the seed I harvested was as good as the seed we bought from our usual seed company. Growing your own seed doesn't mean compromising on seed or variety quality. In fact, as you'll see later in the book, if you start taking the time to choose the best plants to go to seed, the subsequent crops you grow from that seed might even outperform your starting varieties.

Third, there wasn't much of an investment in equipment to get a seed crop. I did it with stuff I already had in the kitchen. If you were going to invest in some basic seed equipment that would be maybe \$40 for two box fans, and five dollars of miscellaneous colanders and spaghetti strainers from the second-hand store. Add in a few tarps you might already have kicking around, and you're up and running.

Fourth, you can pack up the seeds in kraft envelopes with simple printed or handwritten labels to sell at your farmers market during your spring plant sale. You can make money from your seeds without adding an online farm store or launching your own seed company. If you have enough seed you could sell it to another seed company!

Fifth, letting leafy greens go to seed means that there are more flowers in your garden. Those flowers are an ecological blessing to market gardens. They provide nectar to pollinators and predator insects. These flowers can also distract some pest insects like tarnished plant bugs from your other crops. Not to mention that you get to smell the delicious sweet smells of brassicas in bloom.

And sixth, seed work is profoundly satisfying. Turning that mess of feed sacks and broken-up plants into a pile of clean seed is the most amazing magic trick you can do. Each time you clean seed, it gets easier and more efficient but it is no less satisfying. If anything, growing bigger buckets of seed makes that magic more spectacular. Plus you get to experience that feeling of pushing your hands deep into an ocean of seeds and feel them rolling over your skin and between your fingers. And when that seed germinates the next year, the magic is truly complete.

All that to say, growing seed on your farm is not as hard as you might think.

## About Tourne-Sol Co-operative Farm

Farming is deeply intertwined with the specific location where it takes place so I want to tell you a bit about where I farm.

Tourne-Sol Co-operative Farm is situated in Les Cèdres, Quebec. We are 45 to 60 minutes west of downtown Montreal depending on road closures and construction.

Our farm is in zone 5a on the Canadian hardiness map and 4 on USDA hardiness maps. We typically can get in the field around May with the last spring frost usually in mid-May, with the occasional early June frost. Summers in our region

range from 82°F to 90°F (28°C to 32°C) with high humidity and possibilities of rain throughout the season. Our first fall frost can arrive anywhere from September 19 to mid-October. We're usually out of the field by early November and we get a lot of snow during the winter.

We grow certified organic vegetables, cut flowers, and seeds, using tractor-based farming systems. Our vegetables go to a 500-member CSA veggie basket program that runs from the end of May until mid-November. Our seeds are distributed through an online store and through a seed-rack

program. We also grow flowers for a summer bouquet subscription.

Tourne-Sol is run as a workers' co-operative, a type of business where the worker members own the business and share in decision-making and profits. We started with five members in the summer of 2005 and we've grown to ten members and ten non-members, totalling twenty people who farm together.

Throughout this book, I will tell some stories from my seed work at Tourne-Sol to illustrate

how the information applies to a real farm and provide you with insights into one farm's journey to integrate seed production into a vegetable farm.

Your story will be different based on your climate in addition to your farming practices, preferences, and challenges. I always appreciate knowing more about the farmers behind the books I read and I imagine you do too!



*Some of the 2022 Tourne-Sol team. It's hard to get everyone in one place for a picture!*

Credit: Erika Rosenbaum

## HOW TO READ THIS BOOK

This book is written with vegetable and flower growers in mind. While I generally use the word farmer, the content of this book is just as applicable to home gardeners.

Whether you're a novice or a seasoned seed grower, this book accommodates individuals of all seed experience levels. If you're new to seed work, you should start at the beginning and read the book sequentially.

If this is not your first seed rodeo, feel free to navigate to sections of interest. However, keep in mind that the book is structured to build upon itself, so starting from the beginning can provide valuable insights regardless of your expertise level.

**In Part 1** of this book, we'll dig into the mindset to grow your first seed crop without worrying about all the seed rules. Your only goal in Part 1 is to harvest mature seed.

Chapter 1 guides you through how to choose your first seed crop. It lays out the core botanical concepts that can enrich your first seed growing but also invites you to ignore these rules in order to experiment and learn from your own observations.

Chapter 2 explores the similarities and differences between growing seed crops and vegetables or flowers for market. It highlights the challenges you will likely encounter when you grow both in your fields, and offers management strategies to better integrate seed production into your market garden.

Chapter 3 walks you through your first seed harvest and how to start using your own seed on your farm. This chapter is all about celebrating your first harvests while being cognizant that you are not yet at a point where you can totally rely on the seed you've grown.

**In Part 2**, you'll learn about what seed crops are a good fit for your farm.

Chapters 4 through 7 cover four types of crops: fruiting vegetables, cut flowers, leafy greens, and root crops. These crops are presented from the easiest crops to integrate in your market farm workflow to the trickiest, with detailed insight into the growing, harvesting, and cleaning particularities of each.

**In Part 3**, we'll graduate from a First Seed Mindset and figure out how to improve all aspects of your seed work so that you are confident in the seed you grow.

Chapter 8 delves into all the technical skills and tools to handle your seeds from harvest through storage. This chapter also tackles germination tests for your seeds and quite a bit about labelling.

Chapter 9 shifts the focus to a longer-term relationship with seed. Here we'll explore how to make sure you have seed that will outlast you and be the foundation for future farmers. This chapter covers trialling varieties to adapting them to your farm and even breeding new varieties.

Chapter 10 acts as a comprehensive guide to craft a crop plan specifically tailored for seed production. We'll venture into the realm of spreadsheets to explore how to seamlessly integrate the book's insights into planning your upcoming growing season.

Chapter 11 covers the sales opportunities that come with seed. Whether you're looking to sell seed in bulk to other seed companies or contemplating starting your own seed company, this chapter offers invaluable insights and guidance to navigate the market effectively.

By the end of this book, you'll be equipped with the knowledge and skills to grow some amazing seeds! Whether you're a beginner or a seasoned pro, I'm excited to accompany you on your seed-growing journey.

Let's get started!

## Part 1

# Grow Your First Seed Crop

In the first part of this book I invite you to hold a First Seed Mindset.

I want you to forget about how important high quality seeds are to the success of your vegetable or cut flower farm. Push away your fears and worries that any seed you grow might get cross-pollinated by the wrong plants, or that they won't germinate, or that it's too complicated to understand.

I want you to come to seed with a beginner's mind and embrace everything you don't know and all the experience ahead of you.

Is that a little too trippy?

What is important when you start growing seed is not the actual seed you're going to harvest and later sow to grow crops that you will bring to market. (And it is not about preserving biodiversity or establishing food sovereignty.) Instead the important thing is the work skills that you begin to develop as you start observing and working with plants in this new way.

What will ultimately let you grow good seed and have an impact on your food systems and seed systems is getting better at observing plants, identifying the right moment to harvest, figuring out how to effectively and efficiently handle all that plant matter to extract clean seeds. These are the skills you are honing through each seed crop you experience. And that is what I want you to focus on as you begin this journey.

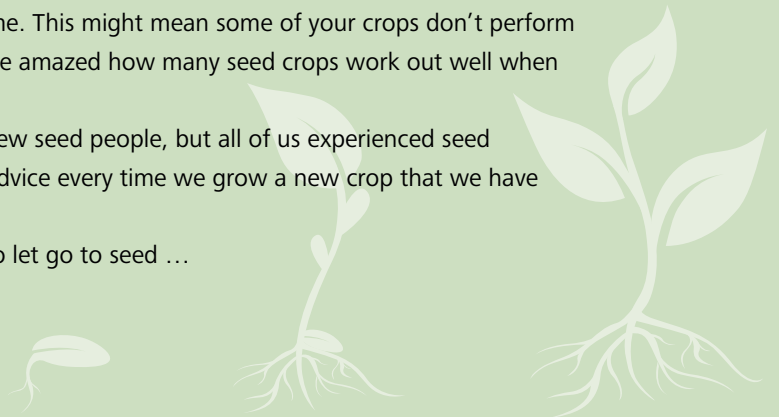
This is what I call a First Seed Mindset.

Over the next three chapters I will guide you through the basic seed concepts that will have a big impact on how you choose, grow, and use your first seed crops. You might think of these as the rules to the seed game.

You have permission to ignore as many of these seed rules as you want when you grow a seed crop for the first time. This might mean some of your crops don't perform as well as you'd like. But you'll be amazed how many seed crops work out well when you ignore most of the rules.

This advice is obviously for new seed people, but all of us experienced seed growers can also embrace this advice every time we grow a new crop that we have never grown to seed before.

So let's choose what crops to let go to seed ...





## Chapter 1

# Choose Your First Seed Crops

**W**HAT SEED CROPS should you grow?

The simple answer is that you should grow seeds for the crops you love to grow, from the crops that are already in your garden. These are the crops that you're already building a relationship with and that you depend on.

I have two stories to inspire you with your first seed crops. The first is a short story that involves a walk in the snow and how there are seeds all around us. The second is the story your annual seed order can tell you, if you know how to look at it right, about what vegetables and flowers and herbs would be good seed crops.

Through these two stories you're going to discover that there are quite a few crops from which you could grow seed but I'm going to ask you to choose to grow only one to three of these crops for seed in your first year.

### **A SHORT STORY ABOUT UNEXPECTED SEED**

I spent the 2001 growing season at Switch Farm in Milton, Ontario. It was my second season working on a farm and everything was still new to me. During that season I visited the nearby Everdale Farm (an incubator/apprenticeship farm) a couple of times. While I was there I spent some time with two apprentices: Andrea and Tanya. They were obsessed with seeds.

In the spring, they had found some Red Russian kale plants that had survived the winter and had convinced the Everdale farmers not to till them under so that they could go to flower and then to seed. When I was there, they were stomping on the dry plants spread out on a sheet. I didn't pay attention to most of the steps but I remember being impressed by the jars of clean seed at the end of the day. Until then I had never thought about where the seeds came from on the farms where I worked.

That January, I came back to Milton for a few days to attend the Guelph Organic Conference. I stayed at Switch Farm and took a morning walk through the deep snow to look at the fields. One of my stops was a flower garden we had



planted with all the unsold plants from the spring seedling sales. It was a tangle of brown dried-up plants that hadn't been tilled under in the fall.

The tallest plants were tobacco plants. They were taller than me and at their top were little brown berries. I knew that tobacco was in the *Solanaceae* family, just like tomatoes and peppers. I guessed these were the tobacco equivalent of tomatoes. What did the insides look like?

I picked a tobacco berry and squashed it. It was full of dusty stuff. But channeling Andrea and Tanya it occurred to me that these were seeds.

I reached out and plucked five or six of these tobacco berries and put them in my pocket then carried on with my walk. I've been growing tobacco plants from those seeds ever since!

Now this is one way you can get into seeds—simply look at what has gone to seed around you and harvest the seeds. This is a time-honored tradition and it works. And that is essentially what I did with my first big arugula seed harvest from the intro of this book. If you grow cut flowers, you've probably had this happen to you too.

## THE STORY YOUR SEED ORDER CAN TELL YOU

Your annual seed order is the list of everything you need for the coming growing season. It is usually the last step of your crop-planning process after you've figured out how much of each crop you'll need to grow for your farmers markets and vegetable baskets and wholesale orders.

If you've already made a crop plan for the coming growing season and you have put together a seed order, then start with that. If you haven't finished this year's crop plan, then go and use last year's seed order. And if you have never compiled your seed order into one sheet, now is the perfect opportunity to do that.

For the following exercise you can adapt your current seed order spreadsheet with the columns I'll mention below; or you can use the Seed Farmer Seed Order spreadsheet at [sheets.seedfarmerbook.com](https://sheets.seedfarmerbook.com)

The Seed Farmer Seed Order spreadsheet is a little too big to fit snugly on one page of this book so I've broken it into two tables. Table 1.1 is what your seed order probably looks like. Table 1.2 are the extra columns you can add to your seed order to guide you through what crops would be a good fit for your farm. You can find most of the information for these extra columns in the Crop Profiles in Part 2 and in Appendix 3.

We will now go through columns I through O and consider what they tell you about growing each of your varieties for seed.

**Table 1.1**

A	B	C	D	E	F	G	H	I
Crop	Variety	Source	Product Code	Qty	Unit Qty	Unit Format	Unit Price	Annual Cost
Bean	Gold Rush	Seed co 3	EX3710	2	5	lbs	\$40.00	\$80.00
Beet	Touchstone Gold	Seed co 2	EX7086	1	100000	sds	\$535.00	\$535.00
Carrot	Dolciva	Seed co 2	EX2685	1	500000	sds	\$335.00	\$335.00
Carrot	Napoli	Seed co 2	EX4275	1	500000	sds	\$750.00	\$750.00
Cucumber	Corinto	Seed co 3	EX3414	1	1000	sds	\$364.63	\$364.63
Hot pepper	Early Jalapeno	Seed co 3	EX2633	1	1/16	oz	\$8.00	\$8.00
Lettuce	Green Frilly	Seed co 2	EX6282	1	50000	sds	\$350.00	\$350.00
Pepper	Carmen	Seed co 4	EX2954	1	1000	sds	\$98.00	\$98.00
Radish	Raxe	Seed co 2	EX8767	3	1	lbs	\$70.00	\$210.00
Tomato	Jaune Flammée	Seed co 4	EX7798	1	2	g	\$15.00	\$15.00
Tomato	Estiva	Seed co 3	EX8798	2	1000	sds	\$41.04	\$82.08
Turnip	Purple Top	Seed co 3	EX6634	1	2	oz	\$4.60	\$4.60
Turnip	Hakurei	Seed co 4	EX2983	1	1	lbs	\$225.00	\$225.00

- Col A: the crop name
- Col B: the variety of that crop; there is a row for each different variety
- Col C: the source where you got this seed. From a seed company, another farmer/grower, or maybe seed from your farm!
- Col D: the product code or SKU that the seed source uses for that variety. This makes it much easier to communicate with your seed supplier in the future so they know exactly what you're talking about.
- Col E: the quantity of seed packs you're getting of that variety.
- Col F: the numeric quantity of seed count or seed weight in each seed pack. This is measured by the units in Col G.
- Col G: the units in which the seed pack is measured. It might be by seed count or by a weight format such as g, oz, lbs, kg.
- Col H: the price of that seed pack.
- Col I: the total cost for that variety. This is Col E (qty) x Col H (unit price).

Table 1.2

A	B	J	K	L	M	N	O
Crop	Variety	OP/ F1	Certified Organic	Species	Selfer / Crosser	Life Cycle	Type of seed protection
Bean	Gold Rush	OP	Yes	<i>Phaseolus vulgaris</i>	Selfer	Tender Annual	Protected Dry Seeds
Beet	Touchstone Gold	OP	Yes	<i>Beta vulgaris</i>	Crosser	Replanted Biennial	Protected Dry Seeds
Carrot	Dolciva	OP	Yes	<i>Daucus carota</i>	Crosser	Replanted Biennial	Naked Dry Seeds
Carrot	Napoli	F1	Yes	<i>Daucus carota</i>	Crosser	Replanted Biennial	Naked Dry Seeds
Cucumber	Corinto	F1	Yes	<i>Cucumis sativus</i>	Crosser	Tender Annual	Protected Wet Seeds
Hot pepper	Early Jalapeno	OP	Yes	<i>Capsicum annuum</i>	Intermediate Selfer	Tender Annual	Protected Wet Seeds
Lettuce	Green Frilly	OP	No	<i>Lactuca sativa</i>	Selfer	Hardy Annual	Naked Dry Seeds
Pepper	Carmen	F1	Yes	<i>Capsicum annuum</i>	Intermediate Selfer	Tender Annual	Protected Wet Seeds
Radish	Raxe	OP	Yes	<i>Raphanus sativus</i>	Crosser	Hardy Annual	Protected Dry Seeds
Tomato	Jaune Flammée	OP	Yes	<i>Solanum lycopersicum</i>	Selfer	Tender Annual	Protected Wet Seeds
Tomato	Estiva	F1	No	<i>Solanum lycopersicum</i>	Selfer	Tender Annual	Protected Wet Seeds
Turnip	Purple Top	OP	Yes	<i>Brassica rapa</i>	Crosser	Replanted Biennial	Protected Dry Seeds
Turnip	Hakurei	F1	No	<i>Brassica rapa</i>	Crosser	Replanted Biennial	Protected Dry Seeds

- Col J: whether the seed is open-pollinated or a hybrid.
- Col K: whether the seed is certified organic or not.
- Col L: the crop species.
- Col M: whether the crop is mainly self-pollinated or cross-pollinated.
- Col N: the plant's life cycle.
- Col O: the way the seed is protected on the plant.

## CONSIDER HOW MUCH YOU SPEND ON EACH SEED VARIETY

Sort your seed order spreadsheet by column I (Annual Cost) in descending order. This will place the varieties that cost the most at the top of your spreadsheet. The varieties at the top of the list are there because you either use a lot of seed for that crop or the cost per seed is quite high. In either case, growing these seeds yourself on your farm will reduce your seed bill. And in some cases this can be significant, especially when you consider that seed can be stored for many years.

Now I'll remind you that I opened Part 1 by saying your first seed crop is not about good seed, or preserving biodiversity, or selecting that perfectly adapted variety that thrives on your farm better than any commercially bought seed. I will add here that your first seed crop is not about saving a lot of money.

That being said, you might as well learn to keep seeds for some crops that will eventually save money on your farm.

## CONSIDER WHAT VARIETIES ARE OPEN-POLLINATED OR HYBRID

In column J of your seed order, indicate whether the varieties on your seed order are OP or F1. The most important botanical concept for producing seeds is the difference between open-pollinated and hybrid seeds. Then you can filter out the F1s to only show OPs. This is what you can see in table 1.4.

**Open-pollinated seeds (also abbreviated to OP seeds)** are stable varieties that will give you the same variety the next year as long as you control any unwanted cross-pollination. You should start with OP varieties when you begin growing seed since they are likely to produce what you expect.

**Hybrid seeds** are created by crossing two plant lines and are marked on seed packs and in seed catalogs with an F1 in their name. The seed you sow will be very uniform but if you keep seeds from a hybrid and grow them out you will get a large diversity of different characteristics. This can be really exciting if you want to develop new varieties but it is very frustrating if you want to reliably grow a specific

**Table 1.3**

A	B	I
Crop	Variety	Annual Cost
Carrot	Napoli	\$750.00
Beet	Touchstone Gold	\$535.00
Cucumber	Corinto	\$364.63
Lettuce	Green Frilly	\$350.00
Carrot	Dolciva	\$335.00
Turnip	Hakurei	\$225.00
Radish	Raxe	\$210.00
Pepper	Carmen	\$98.00
Tomato	Estiva	\$82.08
Bean	Gold Rush	\$80.00
Tomato	Jaune Flammée	\$15.00
Hot pepper	Early Jalapeno	\$8.00
Turnip	Purple Top	\$4.60

*In this seed order, it looks especially tempting to grow your own Napoli or Touchstone Gold seeds. If you grew seed for three years, you'd be saving  $3 \times \$750 = \$2,250$  for Napoli and  $3 \times \$535 = \$1,605$  for Touchstone Gold. But it isn't as easy as that!*

**Table 1.4**

A	B	I	J
Crop	Variety	Annual Cost	OP/F1
Beet	Touchstone Gold	\$535.00	OP
Lettuce	Green Frilly	\$350.00	OP
Carrot	Dolciva	\$335.00	OP
Radish	Raxe	\$210.00	OP
Bean	Gold Rush	\$80.00	OP
Tomato	Jaune Flammée	\$15.00	OP
Hot pepper	Early Jalapeno	\$8.00	OP
Turnip	Purple Top	\$4.60	OP

Once you've filtered out F1 varieties, you can see that Napoli carrots no longer appear. However, Touchstone Gold beets are still a good seed candidate.

### CONSIDER WHICH VARIETIES ARE CERTIFIED ORGANIC

In column K, you can indicate whether the varieties you're ordering are certified organic or not. If your seeds are certified organic, this will be indicated by the seed company where you ordered them.

If you are growing certified organic crops, your certifier expects you to be using organic seeds. In cases where organic seed is not available, you will need to provide affidavits from your seed suppliers that they do not offer organic seed for those varieties.

Growing non-organic seeds in an organic system produces certified organic seeds. This is one way for you to develop an organic seed supply of some crops on your farm and should make your organic certifier happy.

### CONSIDER WHAT CROPS WILL CROSS-POLLINATE TOGETHER

In column L of your seed order, you can indicate the crop species for each of your varieties. This is the scientific name of a crop. It is often in italics near the top of a crop description in a seed catalog. Generally speaking, two crops of the same species can cross-pollinate and two crops of different species cannot cross-pollinate.

#### *What is cross-pollination?*

Cross-pollination occurs when the pollen of one variety is used to pollinate the flowers of a different variety and this produces viable seed. That seed is a

crop that looks a certain way. Do not use hybrid seed varieties for your first seed crops.

#### What crops are OP vs. hybrid?

Some crops are pretty much only available as OPs. These include beans, lettuce, and peas.

For some crops, most of the market varieties available commercially are now F1 hybrids. These include broccoli, carrots, and onions.

And then there are some crops in the middle where you can find a lot of OPs and a lot of hybrids, like tomatoes, cucumbers, and squash.

genetic combination of both varieties, and when you grow it out you will see characteristics from both parents in the same plant.

If you're looking for a uniform stable variety in your market garden, you might be disappointed with this crossed-up plant.

The key to knowing a crop's species is by learning their scientific name. Crops with different scientific names shouldn't cross together. Beets are the species *Beta vulgaris* and they will not cross with carrots which are *Daucus carota*.

Once you start exploring scientific names you might be surprised to learn what crops are related. Beets and Swiss chard are both *Beta vulgaris*. As such they can cross-pollinate each other. Even though the vegetable part of beets and chard look different, if you let these crops flower, you'll see they are really similar one to the other at that stage.

There are two crop families that really confuse folks: Brassicas and Cucurbits.

### Know your brassica species

There are a number of different brassica species. The varieties of different species will not cross with each other. Here are some of the main species you'll find in your garden:

- ***Brassica oleracea***: Broccoli, gai lan, kale, collard, cabbage, cauliflower, kohlrabi, Brussels sprouts
- ***Brassica napus***: Rutabaga, Russian kale
- ***Brassica rapa***: Bok choy, tatsoi, mizuna, Tokyo Bekana, rapini, choy sum, turnip, Napa cabbage
- ***Brassica juncea***: Spicy mustard
- ***Eruca sativa***: Arugula
- ***Raphanus sativus***: Radish, winter radish

So you could grow gai lan, rapini, mustard, and arugula side by side and harvest the seeds and see no cross pollination in the next generation. But if you grow tatsoi and mizuna side by side to seed, you would get some crossed-up greens the next year!

### Know your cucurbit species

These are the most common cucurbit species in your garden:

- ***Cucurbita pepo***: Delicata, spaghetti, acorn, zucchini, pie pumpkin, jack o'lantern, patty pan, crookneck, sweet dumpling
- ***Cucurbita maxima***: Hubbard, turban, kabocha, buttercup, marrow, banana squash, giant pumpkin
- ***Cucurbita moschata***: Butternut, cheese pumpkin, musqué de Provence
- ***Cucurbita argyrosperma***: Cushaw
- ***Cucumis sativus***: Cucumber
- ***Cucumis melo***: Melon
- ***Citrullus lanatus***: Watermelon

You could grow a delicata, a hubbard, and a butternut side by side and harvest the seed and see no crossing in the next generation.

Though two varieties of the same species can potentially cross, you might still be able to grow two or more varieties of the same species depending on how likely they are to cross.

## **CONSIDER HOW LIKELY CROPS ARE TO CROSS WITH EACH OTHER**

Just because two crops can cross-pollinate each other doesn't mean they will cross each other up. And that's what you put in column M of your seed order. There are a number of different ways that plant flowers grow and that pollination happens but for this book we're going to split those ways into three groups based on how likely the crop is to cross-pollinate: Selfers, Intermediate Selfers, and Crossers.

### *Selfers*

These crops barely cross-pollinate at all. Selfers have hermaphroditic flowers that are wrapped in tight petals that make it hard for insects to get to the pollen, and even harder for them to spread that pollen to other plants. This means selfer plants are predominantly pollinated by themselves. (You can probably see why we call them selfers.)

These crops are great candidates for market gardeners who don't have the time or space to isolate plant varieties.

If you have two selfer varieties of the same crop growing side by side and you save the seed of one of them, you will only see one to five percent crossing in the next generation. Now that might be too much crossing for a seed company that wants to deliver true-to-type seeds to their clients. But that's an acceptable amount of crossing for on-farm use.

For your first selfer seed crops, don't worry about isolating selfers from each other—that little amount of crossing won't impact your market garden that much.

### *Intermediate Selfers*

These crops also have hermaphroditic flowers and mostly self-pollinate but you will see higher rates of crossing when you grow varieties of the same species side by side (in the 1–15 percent range). That still might be an acceptable level of emerging diversity in your field. Increasing isolation distance to 100–300 feet between varieties of the same species should greatly reduce crossing.

In each crop profile (in Part 2), I'll talk a little bit more about pollination considerations for these crops. That being said, I don't think you should worry

too much about isolating intermediate selfers either for your first seed crops. (Except for keeping sweet peppers away from hot peppers.)

### Crossers

Crossers are on the other side of the spectrum from selfers. These are plants that predominantly cross-pollinate. Some are hermaphrodites and some have distinct pollen-producing and pollen-receiving flowers. Whatever the flower structures, crossers want to cross. If you grow two crosser varieties of the same species side by side, you will see 20–50 percent crossing, maybe more. That is too much crossing if you want anything predictable in your market garden.

You might think that this makes these crops hard for market gardens to grow to seed. But for most vegetable crossers that actually isn't the case. For most crossers market gardeners harvest the vegetative part of the crop for their vegetable baskets or market stalls. At that stage they aren't in flower and don't risk crossing up with your seed crop. If you only let one variety of a crop go to flower, there will be no other variety to cross-pollinate your crop. This makes it easy to harvest seeds that will produce plants that are similar to their parents. (In a few cases you might need to be aware of wild weedy relatives that can also cross with your crop.)

That means you might have beds of salad greens such as Tokyo Bekana, mizuna, and tatsoi in your fields. Those crops are all *Brassica rapa* and have the potential to cross with each other.

But you could still safely grow a *Brassica rapa* seed crop in close proximity to your salad beds as long as you keep those salad beds from going to flower.

For crops that are harvested as cut flowers or as fruit crops (cucumbers, squash), you will have more challenges controlling pollination if you grow a lot of diversity.

If you do want to save seed from more than one crosser crop in a year, you will need to grow these crops with at least 1,000 feet between your varieties. This will almost completely reduce crossing to near zero. (The exception being if you have neighbors who grow large fields of commercial seed crops; in those situations there can be a lot of pollen in the air that makes some crossers difficult to grow.)

For your first crosser seed crops only grow one variety of a crop species to reduce cross-pollination complications.

**Table 1.5**

Selfer	Intermediate Selfers	Crossers
Lettuce, Beans, Peas, Escarole, Poppies, some Tomatoes	Peppers, Eggplants, Okra, other Tomatoes	Pretty much all the other vegetables and flowers.



## CONSIDER YOUR CROP'S LIFE CYCLE

Column N of your seed order is where you indicate your crop's life cycle. This is when you need to plant your crop to be able to reliably get it to seed. There are three types of plant life cycles for commonly-grown vegetables: annuals, biennials and perennial. Annuals are usually the easiest to grow to seed.

### Is Cross-Pollination All That Bad For Your Seed Crops?

On one hand there are a few reasons why you might want to avoid cross-pollination:

1. You might lose the important culinary traits for a crop—it will become too fibrous, lose sweetness, not have the right moisture content.
2. Your clients might want a specific look or appearance for a crop. If you don't meet their expectations, they might just move on to the next stall.
3. You could affect traits that are important for market growers such as their days to maturity or ease of harvest.
4. You are stewarding a unique variety with a specific story and you want to keep that story intact.

These are all good reasons why you might want to keep a variety stable.

On the other hand, even if a crop crosses up:

1. It will very likely be edible—and in many cases still be delicious.
2. It might exhibit characteristics that you have never seen before—and this might even give you an edge in your marketplace.
3. This can be the beginning of a great breeding project (much more about that in Chapter 9).

4. You'll have less pressure to keep it from crossing in the future because it has already happened!

In fact, there are some growers who really push for growing crossed-up populations of plants. Joseph Lofthouse refers to these as landraces in his book *Landrace Gardening* and promotes growing crossed-up populations as a way to adapt crops to the areas you are farming. Joseph Lofthouse farms in Paradise, Utah, in an arid climate at a high elevation, and writes that he is only able to mature watermelon and other crops by growing these crossed-up landraces.

Practically speaking, as long as you only have low rates of crossing in your crops, you don't have to worry much. If you see any accidental crosses, simply skip those plants when you next harvest for seed. Only keep seed from plants that look the way you want the variety to look.

However, if there is something crossed-up that seems interesting, you might want to keep that seed. But be warned, when you grow it out you will see a full range of diversity and it can get tricky to know what to do with all that diversity. That's the topic for Chapter 9. It's also the chance to expand your mind about what is possible and go down a plant breeding rabbit hole that changes your whole farm.

## *Annuals*

An **annual** is a plant that grows vegetative parts and then goes to flower and sets seed—all in the same growing season. Annuals are usually the easiest crop life cycle to work with. You plant the crop at the beginning of the season and just let the plants do their thing and then you get seeds. There are two groups of annuals:

**Hardy annuals** can tolerate some frost and can be planted as early as your soil can be worked once very deep freezes have passed. Lettuce, peas, and brassica greens are all hardy annuals.

**Tender annuals** can't tolerate frost and should be planted once the chance of frost has passed. You can also plant these under row cover, mini-tunnels or in caterpillar tunnels to extend your growing season. Tomatoes, peppers, beans, and cucurbits are all tender annuals.

The goal when growing annuals for seed is to plant them as early as they can possibly survive in the season so that they have a long enough season to go to seed. If you plant annuals too late, you risk running into very wet weather or very cold weather at the end of the season. Those conditions can ruin a seed crop.

In some cases, crops will also switch to vegetative growth as the day length gets short at the end of the summer, and you wind up with bolted leafy plants with no mature seeds.

## *Biennials*

A **biennial** is a plant that grows vegetative parts in one growing season and then those vegetative parts overwinter and go to flower and set seed in the next growing season. Because biennials need to get through the winter, biennials can have a few more steps to get to seed than annuals do. These extra steps depend on your climate.

In cold Northern climates such as where we farm at Tourne-Sol, most biennials will not survive the winter if they are left outside without protection.

If you grow in a climate where the winter does get cold but not quite as extreme, biennials will often happily overwinter in the field—in these climates, biennials can be pretty easy to grow.

If you live in a hot climate where the weather doesn't usually get close to freezing, you've got a different set of challenges. Most biennials need a certain amount of cold before they will switch to flowering and seed production. This is called vernalization. In this kind of climate, you would need to bring some biennials into cold storage to simulate winter and trick these plants into flowering. This makes biennials trickier to grow in hot climates. Annuals are so much easier.

There are two groups of biennials:

**Root biennials** form a storage root and can be treated similarly to other root crops in cold storage. These are the easiest biennials to plant and replant. Root biennials include carrots, beets, rutabagas, onions, celeriac.

**Plant biennials** grow an above-ground plant that is much bulkier than just a root. These are easiest to grow in climates where they can be left outside through the winter. If you live in a climate where you can't do this, these crops can be more complex to overwinter and don't make for great first seed crops. Plant biennials include celery, chard, kale, collards, cabbage, and other heading brassicas.

Some hardy annuals like brassica greens or spinach can also be treated like plant biennials and grown through the winter.

### *Perennials*

A **perennial** is a plant that keeps living beyond one or two seasons. It might produce seeds in the first year or it might produce seeds after a few years or it might not produce seeds at all for you. A lot of perennials are propagated in ways other than by seed.

## **CONSIDER WHAT SEED GROWS BETTER IN YOUR CLIMATE**

In column O of your seed order, you can indicate the type of seed protection that each crop provides as it grows its seeds. This seed protection has a big impact on how well different crops will grow in your climate.

Technically you can probably grow almost any crop to seed on your farm, but your climate is more favorable for some crops than others. Focusing on the seeds that do best in your climate will increase your seed-growing success and make you much more inclined to keep working with seeds!

Start by considering the amount of precipitation you get in a season. (Temperature also has an impact on how easily seeds can be fertilized and set. John Navazio has a great chapter about this in his book *The Organic Seed Grower*.) Are you in a dry or humid climate? Rain and ambient humidity can cause havoc on a seed crop. They can result in diseases and seeds germinating on the plant. If you farm in a dry climate, you can harvest high quality seed from just about any crop. If you farm in a wet climate, then you need to carefully choose the seed you will save or grow some seed crops in a tunnel or greenhouse.

There are three broad categories for how seed crops fare in different humidity levels.

**Naked Dry Seeds** grow unprotected on a plant and are completely exposed to the weather. Cilantro and dill are examples you may have seen in your garden. Plants with naked seeds are very susceptible to diseases or to germinating on the plant before they are harvested. They are not a great fit for wet climates. Other naked dry seeds include spinach, beets, chards, lettuce, carrots, and onions.

**Protected Dry Seeds** grow in pods or in fruits so are not exposed to the weather. Though these often prefer drier climates, they can do well in wet climates. Protected dry seeds include brassicas of all types, beans, peas, and corn.

**Protected Wet Seeds** also grow in fruits. They are not exposed to the weather. These crops thrive in humid climates. Protected wet seeds include tomatoes, peppers, squash, melons, and cucumbers.

### *What type of seed protection should you prioritize for your first seed crops?*

You should focus on working with crops that are more adapted to your humidity. This way you will likely have weather working with you instead of against you. You can come back to the other crops on your list when you have mastered the crops suited to your environment and you are ready to take the next step.

## What We Grow At Tourne-Sol

At Tourne-Sol farm, we have a warm spring and a hot summer. We also have lots of moisture.

Moisture that comes as rain, rain, and more rain; even in drought years, the ambient humidity will often be close to 100 percent.

We have the most success with protected dry-seeded and wet-seeded crops. Specifically crops that can set seed in a warm spring and tolerate hot summers and crops that can set seed in hot summers.

These are the crops that we focus on: tomatoes, peppers, eggplants, squash (summer and winter), cucumbers, melons, watermelons, *Brassica rapa*,

*Brassica juncea*, arugula, radishes, kale, beans, and peas.

We also grow a fair amount of lettuce seed in unheated greenhouse areas. Their yield and quality have really increased compared to when we used to grow seed in the open field.

We do grow more than just these crops, but these are the crops for which we dedicate the most growing space.

Your crop mix will depend on your climate and farm infrastructure and will probably look different than ours.

## CHOOSE ONE TO THREE VARIETIES TO GROW TO SEED

Now that you've looked at the varieties on your seed order through all these different lenses, it's time to decide which of these varieties you will plan on growing to seed this year.

Choose from one to three varieties. This number of summer seed projects is small enough to not be too much of a burden when you try to fit them into your growing season.

Going through these steps, there are probably already a few crops that are awfully tempting to you. And you can choose whatever crops you want for your farm. If you're still not 100 percent sure, here are my recommendations and one thing you probably shouldn't start with.

### *My UNrecommendation*

First off, do not choose squash as your first seed crops, simply because you're likely growing many different squash varieties of the same species on your farm to sell at market or put in your CSA baskets. All these vegetable squash flowers will happily cross-up with your seed crop.

It is possible to control most of that crossing by growing your squash 1,200 feet apart or by manually pollinating the flowers yourself. But these are extra steps I don't recommend to new seed farmers who also have packed to-do lists.

Put squash aside as one of your first seed crops.

### *Recommendation 1*

For a first seed crop, annuals are definitely easier to grow. If you're only growing one first seed crop, make it an annual. The easiest crop for most farmers to choose is a pepper or a tomato.

You can grow these with your market crops without any isolation and simply keep a few ripe fruit in peak season to extract the seed. These are the easiest crops to start with.

If you're going to commit to two or three seed crops then here are three more suggestions.

### *Recommendation 2*

Grow a salad green—either a lettuce or a *Brassica* green like arugula, mizuna, or Tokyo Bekana. Grow this crop as part of your market crop. Harvest it as a mixed salad green. After you finish harvesting for salad, let the rest of the crop go to

seed. You could leave ten bed feet to go to seed if you're feeling conservative. If you're feeling ambitious, let the whole bed go to seed!

### ***Recommendation 3***

If you grow cut flowers, then choose a cut flower you know already goes to seed by the end of your season. One of those flowers that even if you deadhead them, you still wind up with mature seed on plants. Calendulas and amaranths are great choices. Crops that you harvest for ornamental pods are also good choices. They just have to wait a bit longer on the plant and they have mature seed. Nigellas and poppies are examples of these.

### ***Recommendation 4***

Biennial seed crops are a bit trickier but the challenges of growing biennials, especially root biennials, are not insurmountable. If you're going to grow two or three first-seed crops, then adding a biennial gives you more learning opportunities as you figure out how to get them through the winter. They also give you an extra sense of accomplishment when you get to seed harvest.

If you grow somewhere where the winter is mild and many crops will easily overwinter, then kale or collards are great biennial seed crops to try.

If you live in a very cold winter climate, where most vegetables won't survive the winter outdoors, then rutabagas, beets, turnips, or winter radish are a good choice. Start by growing a market crop and then choose the best looking roots to store through the winter in your cold room and then replant to grow seed the next year.

## THE FIRST SEED PLEDGE

Now that you've made your seed choice it's time to commit!

I've written a first pledge for you to help you remember that this first seed crop is simply about starting a relationship with some seeds. The following can be done alone or with your farm team, with family members, or with friends. If it's your style, you can also record yourself and broadcast your resolution to the world on social media. (And if you do do that, please tagme!)

Put your hand over your heart and say the following out loud ...

I, (YOUR NAME), resolve to keep the seeds from these seed varieties (NAME THE VARIETIES) this growing season.

I do not need to worry about isolation distances or population sizes or even selecting the best plants.

My goal is to simply

- let the variety go to flower then seed
- extract the seeds from the crop
- get the seeds clean enough
- dry the seeds for two to three weeks
- and then store the seeds in a container

(I will not forget to label the container with a variety name and the year.)

Once the seed is in a container, I will place it with the rest of my seeds so that I will see it next year when I check my seed inventory and I will include a bit of this seed in my crop plan.