SEEDS OF DIVERSITY

by Bob Wildfong

Pure isolation

When I was younger, I thought harvest-time was the best season of the gardening year. Now, I realize that winter is the most satisfying season. So far, my 2008 garden is perfect. There are no weeds yet, and no sign of droughts. All of the veggies are in perfect condition in nice straight rows, in my mind's eye. The flowers will undoubtedly bloom continuously all season, and we'll have a long lazy summer with no disappointments. At least, nothing has gone wrong yet.

This is also the time of year for planning, shopping, making lists of seeds to buy, and then trying to shorten that list when the reality of limited space sets in.

I get a lot of questions from people who want to save some heritage seeds in their garden, maybe multiply a rare variety or two, but don't want to miss their other favourites. How much space do you have to keep between varieties if you want to save their seeds?

Spacing specifics

For a few common heritage vegetables, tomatoes and beans in particular, it's easier than most people think. Ten or fifteen feet should do it, most of the time. In other words, if you grow two kinds of tomatoes with ten to fifteen feet of space between them, you can save their seeds, and replant them next year. They *probably* won't cross over that distance, so you can make your own heritage seeds (and if you keep them cool and dry they'll last for up to ten years).

If you're thinking you've read something else, you're right. There is a lot of differing information out there. Some authorities say "grow different kinds of tomatoes and beans ten feet apart, to keep them from crossing." Some say "tomatoes and beans are essentially self-pollinating, so isolation is not needed." On the other hand, some reputable books and researchers advise up to fifty feet of separation between varieties. Who's right?

The problem is that we all want a simple and general rule of thumb about isolation distance, but pollination is too complicated to obey any simple rules. Bees don't care whether your beans are ten feet apart or twenty. They just do their busy work, and usually don't pollinate beans, at least not much. Bees sometimes visit tomato flowers, but not often, and less so if there are tastier flowers nearby. Besides, it depends on how many insects you have in your garden.

Another complication to the rule of isolation distance is the degree of purity that different people want. If you're saving seeds for your own use, you can accept a little crossing. Say your saved seeds are 99% pure. Is that good enough for your own use? Probably, because it's the same standard that you'll get for a lot of commercial garden seeds. On the other hand, if you're multiplying seeds for a permanent seed bank, you might want to aim a little higher, like 99.9%. So you can live with less isolation in a home garden situation, just for your own use. And that's a good thing, because most home gardens don't have room to spare!

I know a compulsive seed saver who just has to collect seeds from every plant, even those grown "too close." He grows samples of those collected seeds, just to see how much they crossed. You can learn a lot this way, but I don't advise becoming so obsessive about it. The man is a fool, really... but enough about me, let's see what isolation truly means.

The chart shows approximately what to expect when you separate different varieties of tomatoes from each other, and save their seeds. You can grow them only five feet apart, if you don't mind every twentieth seed becoming a hybrid.

Rough expectations of seed purity based on isolation distance between tomato varieties

Purpose	Isolation distance	Amount of cross-pollination to expect
Home garden (your own use)	5 ft. (1.5 m)	about 5% (one in 20)
Home garden (sharing with people you respect)	10 ft. (3 m)	about 1% (one in 100)
Commercial sales	15 ft. (4.5 m)	under 1%
Seed banking	20 ft. (6 m)	under 0.1% (less than one in 1000)

Antohi Romanian pepper.

It just means that next year when you sow those seeds again, every twentieth plant will be something half-way between the two original varieties. If you only plant five in your garden, you have a 3/4 chance of them all being what you expect. That's pretty good for most home uses, and the occasional hybrid will be a perfectly good tomato too, just different.

For commercial sale, I always recommend 15 feet separation for tomatoes and beans. I know though, not naming any names, that a lot of commercial growers pack their rows closer. Somehow, the seeds seem to be good anyway. Even the most reputable seed companies don't give 100% purity. That's impossible in the real world. Plant enough lettuce seedlings, and you will always discover one or two that look different from the rest. If it's just one out of every few hundred, I think we can all agree to overlook it.

On the other hand, when Seeds of Diversity's members multiply seeds for permanent seed banking, I always stick to a higher standard. Twenty feet between different varieties of beans, and tomatoes will ensure very high purity (there are some exceptions for wild/currant tomatoes and some runner beans, so if you're growing for a seed bank, don't take this article as your only education). But seed banks often keep fairly small samples, over many years, so every "bad seed" in the sample is a potential genetic contaminant to the variety for decades to come.

So far, I've just been talking about the two easiest vegetables for seed saving: tomatoes and beans. They're easy because they rarely cross-pollinate. Many other kinds of vegetables, and most flowers, are easily cross-pollinated by insects, so isolation is more

difficult. Squash, for instance, is hard to keep isolated from other squash because bees can fly a long way from their hive, and many of us have neighbours who grow squash, pumpkins or zucchini.

Species selection

On the other hand, if you know which kinds of squash are growing nearby, you can save seeds from different species. There are four species of squash in common use, and they don't cross with each other. For instance, pumpkins (*Cucurbita pepo*) cross with acorn squash (also *C. pepo*), but not with butternut squash, a different species (*C. moschata*). It takes some reading to find out which varieties are in each species, but you can find out from any good seed saving book and many heritage seed catalogues.

Say you want to grow several kinds of peppers, and you'd like to save seeds from one of those. Grow the others together, and let them cross. They'll make great peppers, and you'll discard the seeds when you eat them. The seed variety needs to be isolated. If you can put the seed variety 100 feet (30 m) away from the rest, that should give you good isolation. But if you can't, try making a barrier.

Building barriers

Peppers are pollinated by bees, and some kinds of flies. If you can keep the insects from travelling between the peppers, you can prevent crossing. One method I've tried is to put spun-polyester row cover (also known as Reemay) over the peppers that are meant for seed. In theory, the cover allows sunlight and rain to penetrate, but keeps insects from travelling through. In hindsight, it obviously doesn't work unless the bees or flies are already inside. All that happens is that the flowers don't pollinate, and fall off.

A better way is to wait until the seed crop peppers are just starting to flower. Pick off any flowers that have already opened (because they might have cross-pollinated already), then cover the other peppers. Use row covers, blankets, bedsheets or whatever you can, as long as it isn't plastic, since that would cook the plants in the sun.

One year's saving equals many years of sowing.

The seed peppers will be pollinated by insects. The non-seed peppers will be fine under the bedsheets for a few days. Then, release the covered peppers, and mark the pollinated flowers on the seed peppers with a little bit of yarn tied around the stems. You can tell which flowers have pollinated, because they'll show tiny fruits. Now, the rest of the flowers will cross-pollinate freely; but those that were pollinated when the other varieties were covered will be self-pollinated and will make good seeds.

Timely isolation

If you don't have enough space to isolate varieties, you can use time instead. Einstein would be proud. Time isolation means that you grow an early variety near a late variety. Since the flowers don't bloom at the same time, they can't cross. This is a good way to grow two kinds of sweet corn. The books give the rule of thumb that you have to keep different varieties of corn separate by up to two miles. That's hard to do in any garden. But if you grow a very early variety, and a very late variety, chances are that the first will ripen its tassels (the part at the top that makes pollen) up to two weeks earlier than the other. At least you'll know that the early variety's seeds haven't crossed with the late variety. And if you cut off the early variety's tassels a week before the late variety is ready, you'll have a good chance of getting pure seed from the late variety (especially if wind or rain removes the early pollen from the area).

The best advice is to keep your saved seeds for as long as possible. You don't have to regrow them every year, or even every other year. Most vegetable seeds will keep in cool, dry storage for five or even ten years. One year's saving equals many years of sowing. That makes it possible to save many varieties of plants, a different assortment each year, and still leave plenty of room in the garden for your favourites.

Planning your garden for seed saving can be as simple as putting different varieties of tomatoes on each end, or it can be as complex as you can imagine. I'm always happy to answer any questions about how to make seed saving easier and more successful.

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More details on seed saving techniques can be found in Seeds of Diversity's handbook *How to Save Your Own Seeds*. See www.seeds.ca for ordering information.