Seed Saving Guideline No. 3

Preserving Varietal Purity

Over the years plant breeders, farmers and amateur gardeners have produced a vast number of different vegetable varieties. Anyone can preserve these varieties and continue to grow them in the future. Their preservation has two simple rules: Remove undesirable individuals and prevent cross-pollination.

Roguing

You will need to save seed from **open-pollinated** varieties (not F1 hybrids). If you remember the two rules this will ensure the seed you save remains true to type. Open-pollinated varieties are inherently variable, each plant being slightly different from every other plant. It may be useful to think of plants as a 'group' rather than as clones. The amount of variation may be slight, as is the case with tomatoes, or quite noticeable, as with some brassicas. Variability is one of the advantages of an open-pollinated variety as it allows some degree of adaptable resistance to diseases, pests and stress. It also allows future breeders to select various characteristics from which to develop other varieties. However, if the variability is too broad the variety loses its distinctive character.

To prevent this widening drift when saving seed you will need to **rogue out** those plants that are too far removed from the original standard for the variety. This involves some careful observation. Those plants that are markedly different need to be rogued out (removed) as soon as they are spotted so that they do not contribute to the next generation. When sowing seeds you will lose some to pests, disease and other factors, but you should also consider sowing more to allow for roguing out. In some of the Guidelines you will notice a recommended minimum number of plants to save seed from, so bear this in mind and sow a few extras.

Pollination

Inbreeding vegetables, for example peas and French beans, will not cross with each other or cross rarely, so most of that referred to below will not be relevant. Nevertheless, if saving seed, precautions need to be taken even for those that cross only rarely.

With **outbreeding** vegetables, e.g. brassicas, runner beans, alliums and beetroots, keeping pollen from different varieties away from each other is more important than roguing out as it will widen the genetic variability of the stock in the next generation. You may hopefully be able to rectify this by roguing out in the future, but this is difficult and takes both patience and several seasons to accomplish.

The easiest way to prevent cross-pollination is grow just one variety, as pollen can be transported between plants by wind and insects. If a neighbour is growing a vegetable that could cross-pollinate you will need to bear this in mind. One way you can reduce this risk is to grow varieties far enough apart that the pollinating vector cannot carry pollen to your seed-saving plants. This distance differs with plant species and is referred to as the **isolation distance**.

Isolation distance need not just be in terms of physical distance but also in time. Obviously growing in different years will work but if possible you can also isolate by ensuring that flowering does not occur simultaneously; sowing one variety early and the other later. In Britain with our shorter season this isn't so easy.


Isolation cages

Another way to isolate is by using barriers to prevent insects reaching the flowers. Barriers to wind-carried pollen are available, but are so closely woven that they can cause other problems. Barriers need not cover the whole plant but just the flowers that you wish to save seed from. Runner beans can have their flower trusses covered, for instance.

As isolation cages restrict insects from transferring pollen, they also restrict insects from pollinating their flowers. There are a few ways around this.

- Alternate day caging
  If you were growing two varieties of broad beans, for example, you could cage one the first day and then cage the other the next and repeat like this. This would allow pollinators to access both varieties but on different days.

- Hand pollination.
  Very time consuming but effective. However, be prepared for some flowers to abort if you don't do it properly. Use a fine brush. More details can be found in the crop-specific Guidelines.

- Introduce pollinators.
  You could use captured bees, bee hives, mason bees, or flies. Flies are the cheapest and easiest to maintain and manage, but not as effective as bees. Buy from an angling shop as maggots (buy 'whites') and put them somewhere to encourage pupation (become castors), then transfer to your cage before they hatch into flies. Putting them into a margarine tub with a hole cut into the side will protect them from the rain and allow them to fly out when they hatch. Make sure that the shop knows how you intend to use the maggots as they are sometimes treated to prevent them hatching. The whole process can take between two and three weeks and needs to be done several times. Think ahead, get the maggots before the flowers open.

Isolation Barriers

Placing a barrier over a plant or its flowers can lead to problems. Physical barriers reduce light and increase heat so be ready for a growth spurt or flowers aborting because they get too hot. Another problem is the development of an environment that suits fungal growth (wet and warm) and the proliferation of pests with no predator able to get inside (including you). The last problem is ensuring that the pollinators are ready to work at the time the flowers are open (including you hand pollinating).

Mason bees on brassica flower

Do not expect every flower to be pollinated. This doesn't happen outside and is the reason plants produce lots of flowers. Flies will pollinate around 40% of brassica flowers; bees will do much better. Don't be daunted by this, being forewarned will ensure that you are better prepared.

There are numerous materials and methods of construction you can employ to make tents and bags. We've used various materials, some cheap (99p a metre) and some expensive (£7 a metre). For the home grower the cheapest and most readily available are close-weave net curtains, used as bags or cages and supported with wire, reinforcing rods for concrete, willow, bamboo or anything else you can think of. Contact the Heritage Seed Library if you would like a copy of an article illustrating a possible technique for constructing an isolation cage.

Another thing to think about is rain cover. If, as in the case of leeks, the seed heads are maturing later in the year, rain can inhibit ripening and promote fungal infection. Many people who grow flowers for shows use plastic conical covers to protect the blooms, a method that could be adapted for vegetables.

Remember your first priority is to keep a variety pure if you want to save it.