Farmers as seed breeders and custodians

If the integrity of farming is to be restored and preserved, it is crucial for farmers to resist the corporate grip over seeds and regain and retain self-reliance in this and other inputs, says Deepika Kundaji.

ANYONE who can successfully grow a crop is sufficiently equipped to save its seed. There is nothing that a farmer does not know about seed production. A seed germinates, grows, flowers and produces more seed! Seed is the beginning and the end of the growth cycle of a crop – something that every farmer is very familiar with.

For millennia, ever since plants were domesticated, seeds have been inseparable from farming. Even now, in most rainfed areas, especially on small subsistence farms which are linked to local markets, seed production is still an integral part of farming activity. Not as a specialised activity, but seamlessly merged with the growing of crops and the totality of work and life on a farm.

All the agricultural biodiversity that is our heritage has been maintained and developed in such farms and these unknown farmers are our real seed breeders – claiming no property rights, no royalties, no acknowledgement. The situation started changing when the first experts were brought in to ‘improve’ crops and make agriculture ‘profitable’ (improved for the profit of companies). Once these seeds were released and pushed on farmers, packaged with accompanying inputs, it was the beginning of the end of traditional agriculture and all its plant wealth.

Today only fragments of this wealth survive in remote or hilly areas or in backyard gardens which the agro-industry has not yet managed to invade. Governments around the world, who are the present ‘official’ custodians of seeds, choose to store them in vaults deep below the Arctic ice, protected by international laws, or in well-guarded national seed banks, nameless, homeless, numbered accessions in concentration camps, where no farmer dares or is allowed to set foot.

The industrial way of life now dominates and encompasses farming as well, which is slowly but inexorably being absorbed into the agro-industry business. Thus many of the essential inputs of farming, which used to be produced and recycled within the farm in a rhythmic manner, season after season, year after year, are now being purchased from companies and factories at very heavy cost. Of all the inputs required on a farm, the corporate grip over seeds is the most alarming because it threatens to hold farming hostage to big business interests.

If the integrity of farming is to be restored and preserved, it is crucial for farmers to regain and retain self-reliance in all inputs, especially seeds.

In areas where seed saving still survives as an integral part of traditional farming, it only needs to be honoured and safeguarded. In other areas where farmers have lost their connection with seeds, they need to win back their privileged role as seed breeders and custodians.

Seed saving – then and now

Seed conservation/production today is compelled to be slightly different from seed saving in traditional ag-
griculture because it has to adapt to greatly changed circumstances. The simple process of sowing a seed, letting it grow, flower and finally harvesting the seeds, now needs one additional step – maintaining varietal purity. While the job of maintaining varietal purity is an important task for a seed producer today, this was never so in traditional agriculture. Why?

Crop diversity in traditional agriculture was ‘created’ by a combination of natural and human influences. Varying geographical conditions, natural plant mutations and cross-pollination are some of the natural factors that created diversification within species. The human element in crop variation came from intelligent selection by farmers, combined with historical events such as new varieties brought from other regions by travellers and migrating populations. This is how, for instance, thousands of rice varieties came into existence.

This stunning diversity was maintained for thousands of years. It was possible only because of the sheer vitality and extent of farming across the whole country. Wherever farms existed, crops were grown and seeds were routinely conserved. Each cluster of villages had its own unique varieties. Farmers all over the Indian subcontinent only continued to do what they typically did – grow crops and store the seeds – season after season. It was physical isolation by geographical separation that ‘maintained’ the unique qualities of varieties.

This massive geographical canvas – where crop diversity was naturally maintained – does not exist anymore. Today farmers, groups or individuals who wish to revive traditionally bred seeds are few and far between. They source seeds from all over and start building a collection. Such collections are urgently needed and most valuable, but they are still artificial responses to an emergency situation, like Noah’s Ark. There is an inherent risk in such collections where several varieties of the same species are confined to and grown in a relatively small area – the risk of cross-pollination. This sounds paradoxical because cross-pollination is a natural phenomenon and one of the causes of diversity in the first place. In the context of building and maintaining a seed collection today, ironically, this very force can also eliminate diversity. The desirable qualities of a crop variety can be lost by cross-pollination if more than one variety is grown in a small area. Since our aim is to conserve varieties rather than lose them, it becomes unavoidable to introduce and follow, wherever necessary, practices to maintain purity of varieties.

Sourcing seeds

Any work of seed conservation/production has to begin with sourcing seeds. A collection could be special-

ised for one crop, e.g., a collection of rice varieties, or it could be generalised – a collection of home garden varieties which would include a wide range of crops.

Backyard gardens, rainfed farms, remote regions and hilly areas are some of the places where seed treasures still exist and should be sourced via farmers’ networks.

National seed banks are supposed to preserve this wealth. However, a closer look reveals that these banks do not preserve crop diversity per se, but are meant to provide plant material to specialist plant breeders for ‘crop improvement’. Farmers do not come into the picture except as victims of officially released varieties. Wherever farmers’ collectives are active, attempts should be made to access these collections and make them available for field trials. After all, where did these varieties come from in the first place?

The focus while sourcing seeds should be on finding traditionally bred varieties. The term used today for traditionally bred seeds is ‘open-pollinated’, referring to the natural conditions in which these varieties originated.

Open-pollinated seeds stand in contrast to seeds produced by modern methods such as hybridisation. Hybrid seeds are obtained by the intentional crossing of two plant varieties.

Hybrids and traditional seeds – the difference

From the seed itself, it is not possible to distinguish between a hybrid and a traditional seed. As a rule, however, hybrid seeds come with a high price compared to open-pollinated seeds.

When hybrid seeds are sown, the offspring are of a uniform type. But
if the seeds produced by the offspring are sown, they will show variations. If the seeds from the offspring do not show variations, then it is just a fake hybrid with absolutely no justification for its premium price.

Even an authentic hybrid, for that matter, is a giant fraud, as some scientists have so convincingly argued. Their contention is that hybridisation is a crafty method used by seed companies to make farmers captive purchasers of seeds. Hybrid seeds cannot be saved by farmers because variations show up in the second generation. In some hybrid crops, the parental lines are inbred to such an extent that they become sterile. This is the real agenda behind hybridisation – breeding for sterility – while the seeds are deceptively marketed under tall claims of hybrid vigour and improved yields. The same vigour claimed by hybrid methods can be obtained by essentially traditional methods of crop improvement, but this line of work is totally ignored because it empowers farmers to produce their own seed. Farmers’ empowerment is the last thing that seed corporations are interested in.

Seeds of open-pollinated varieties, on the other hand, have been and can continue to be kept by farmers. If the variety is stable, its qualities will continue to be expressed in successive generations. Technically this is known as ‘breeding true to type’ or ‘breeding true’. Because open-pollinated varieties ‘breed true’, anyone can save their seeds.

Maintaining varietal purity – why?

If two varieties of a species, e.g., two kinds of lady’s finger or two varieties of brinjal, are grown together in a garden of say 500 square metres or even larger, the challenge of maintaining varietal purity has to be faced. Wherever insects are observed on flowers of crops – bees of different kinds, wasps, butterflies – either foraging for nectar or for pollen, we can be fairly sure that they are at the same time transferring pollen from flower to flower. If this happens between flowers of a red long lady’s finger and green short lady’s finger, the uniqueness of both is likely to disappear. If a bee transfers pollen between a hot chili and a sweet capsicum, both being varieties of the same species Capsicum annuum, the capsicum is likely to lose its sweetness. In technical terms the resulting seeds will not ‘breed true’ or be ‘true to type’.

This worry of cross-pollination causing loss of desired qualities of a crop variety, of course, does not apply to a farmer who has no intention to grow many varieties of a single species, but merely wants to revert to a traditionally bred variety and save its seed for next season. It is only a matter concerning those who want to grow more than one variety of the same crop (e.g., small fruited brinjal and large fruited brinjal or a red lady’s finger together with a green one and white one).

Techniques to maintain varietal purity are not at all impossible to learn. It can be done with very little resources. But if it is an added burden to farmers who are already overworked, it would be simplest for individual farmers to grow and save seeds of one variety per crop (species), so that it just has to be grown, and seeds harvested, in the traditional way.

There are also some crops which are naturally closed to cross-pollination or where the percentage of cross-pollination is very low. In such cases two or more varieties can be grown for seed purposes without much worry about cross-pollination.

Anyone who has a look at official standards for seed production will immediately be discouraged. Seed production is made to appear as if no one other than a huge scientific establishment with mega funding can produce good-quality seeds. This is totally incorrect. Every farmer is a natural seed producer. Even with the additional job of maintaining varietal purity, it is still highly achievable for any farmer, small grower or even city gardener to produce seeds which are qualitatively excellent.

Deepika Kundaji is an organic farmer working at Auroville, an international community township on the outskirts of Puducherry along India’s east coast. She has created a register of seed varieties which she grows and selects herself, and shares her work on seeds with interested organic farmers nationwide.

Endnotes

1 We choose to use the term ‘traditionally bred’ varieties instead of ‘open-pollinated’.
2 Jean Pierre Berlan