

Multiplying and preserving the seeds of local vegetable varieties

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Reproducing and preserving seeds of local vegetable varieties (municipality)

Host:

Local seeds are the cornerstone of agriculture and food security in developing countries, and they are the most important sources of safe and healthy food. They allow people to produce their own food without outside interference or foreign control of seeds.

This audio blog is designed to help you to produce and save the seeds of your local vegetable varieties. This is not too difficult, and it does not cost anything. By producing your own seeds, you can also achieve as much independence as possible from the companies specialising in producing and preserving seeds. Thus, harvesting your own seeds has several advantages, including lower costs, as you can gather seeds from the previous year's crop. These seeds are also characterised by high adaptability to the prevailing climate conditions, resistance to diseases and insects, a high nutritional value, a high taste quality, and a wide variety of varieties.

The identification card for the guest participating in this audio blog:

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With colleagues from Syrian academic expertise, he has been involved in creating several guides, including the Manual for the Cultivation of Potatoes in Syria (2020) and the Practical Manual for Domestic Gardening – Renewable Agriculture (2021). He is currently preparing agricultural journals on the agricultural calendar of the most important crops (field crops, fruit crops and fruit trees) in Syria, published every month on the Syrian Academic Expertise website. They include the most important dates for agricultural services and how to implement them scientifically and correctly.

Section I: seed (seed production methods, seed varieties, local seed, seed extraction and conservation manual).

1. What are the most important methods for producing seeds currently used in agriculture in general?

Seeds are the basis for the multiplication and diffusion of plants on Earth, from which the life of a new generation begins. Like all other living organisms, the seed is made up of genes that contain specific genetic traits, specifying the plant and providing much of the food that is saved to begin the germination process.

There are several ways to produce seeds:

- **Natural pollination:** Pollen grains are transferred from one plant to another by wind or insects such as bees. Pollen grains are combined from one plant to another with ovules from another, and pollination is performed from one plant to another and results in nodes. Thus, a plant can create its fruit, which contains seeds.
- **External hybridisation:** A farmer practices hybridisation in the fields by the open pollination of a plant with desired characteristics with another plant in the same species that also has desirable qualities. Then, a new generation of plants is produced, and only the good plants of that generation are selected, which bear only the characteristics chosen from the original plants. In contrast, the plants that have not inherited the required features are dispelled.
- **Modern hybridisation:** The specialist does initial hybridisation and so on until he obtains first-generation hybrid plant seeds, often called F1 (we can see the phrase F1 written on some seed packaging and envelopes in the agricultural pharmacies).
- **Genetic engineering (genetically modified plants):** Genetic engineering is a series of molecular techniques that allow scientists to invent a new type of plant by manipulating genes unnaturally. Some of the most common currently produced GM plants are soybeans, wheat, cotton and tomatoes.

2. What are the most important types of seeds used in agriculture in general?

The seeds currently used in agriculture in general, and in vegetable farming in particular, are divided into three main categories (Table 22).

- **Native seed (municipal):** They are old and unique seeds that are native, produced and preserved by the farmer, and passed down from generation to generation. Hundreds of varieties of one species can be found. The authentic seeds have many positive advantages, including their high selling price, which can be obtained from a previous production (this is the blog's subject). They are highly adaptive to the prevailing climate conditions, are resistant to diseases and insects, have a high nutritional value, taste better and have a wide variety of varieties. However, it is understood that their production is a lower average than that of hybrid seeds. However, there can be a great deal of variety in a single crop, with small, medium and large-scale fruits appearing from the same cultivated variety.
- **Hybrid seeds (F1):** Seeds produced by companies that specialise in hybridisation. They are characterised by high productivity assisted by the use of fertilisers and chemical pesticides. The crop is consistent and can be stored for a longer period. However, it is understood that seeds cannot be collected from last year's production. Therefore, seeds must be purchased new each year. Their resistance to pests is weak. This requires the use of many chemical pesticides, which in turn causes contamination of the soil and a reduction in its fertility. The crop's nutritional value is low, with a focus on quantity, form, and storage.
- **Genetically modified seeds:** These seeds are produced by multinational companies specialising in the manufacture of pesticides and chemical fertilisers. Seeds of these varieties, which are often unsuitable for local conditions, cannot be kept, and agriculture in small areas must be avoided and not cultivated. Among the most prominent GM plants currently produced in the world are: soybeans, wheat, cotton, corn.

3. Can you explain to the listeners, particularly the vegetable growers, why the native seeds are better (municipal) than the others?

Local seeds are among the best used in the home garden for the following reasons:

- Local seeds can be reproduced and improved from season to season since they can be obtained from the previous year, thus saving the high purchase price for the seeds.
- The plants resulting from the sowing of municipal seeds are heat and drought-tolerant and are highly adapted and adapted to the local environment (great variety of varieties).

- Local seeds are well adapted to the conditions of the place where they are cultivated. That is, they are adapted to the local soil and can grow well with local compost, which is resistant to local agricultural pests.
- Their crops have a high nutritional value and quality in taste and distinctive recipes for cooking or preserving.
- Ease of marketing products (fresh and preserved). Means that local seeds can be sold at the market at high prices compared with other products.
- The cultivation of distinctive local varieties characterises the different regions of Syria.
- No environmental damage resulting from the cultivation of municipal seeds; they are considered to be environmentally friendly and preserve the local environment.

4. From the above, you encourage farmers to do seed production and conservation, but the critical question is: Can every farmer or anyone else who wants to farm produce and store seeds?

Yes, each farmer can produce and store the seeds, but on one condition:

- They need to be harvesting local varieties and you need to have a rough idea of the rules of the extraction and conservation of seeds, the so-called Seed Extraction and Conservation Guide.

5. You stated that each farmer can produce and store seed provided that the seed is of a native variety. The second condition you mentioned was that there are important rules in extracting and conserving seeds (the Seed Extraction and Conservation Guide). Can you explain to the listeners, and especially the fellow farmers, these important rules?

Yes, there are ten essential rules, and they must learn them if you want to start extracting and saving seeds from your home garden (local varieties):

- 1. The cultivation of a plant for the preservation of its seeds and its cultivation of food is different:** So usually you can't eat it and save the seeds at the same time (the lettuce, for example, to get the fresh leaves takes two months after the decontamination, but in the case of wanting to extract and save its seeds, we need 4–5 months, you have to wait until the legs of its curved flowers are spent, which eventually produce seeds. By this time, the

lettuce leaves are yellowed, withered, and their taste changed. It's the same with most crops. You can't eat it and save seeds. Either this or that, but the good news is that one plant produces many seeds, so you need to grow only a few to extract and preserve seeds.

2. **Avoid saving hybrid item seeds:** These seeds are for cultivation only for one generation.
3. **The extraction and conservation of seeds of the best plant:** Conserve only seeds from your healthy, disease- and insect-resistant, strong-growing plants, which have a good taste.
4. **Preserving seeds can sometimes be easy, but sometimes long, hard and difficult.** For example, a bean seed is large and easy to remove from its horns; others are small and easily disappear at the nearest crack or hide while trying to obtain it from the seed head. In general, most plants retain their seeds in a variety of other crusts, horns, capsules, and covers, which are often difficult to remove. The process varies depending on the type of seed but usually involves study (separation of the seed from the plant) and sowing (separation of the seed from the rest of the plant).
5. **Sometimes, extracting and preserving seeds requires additional steps:** Seeds that grow in large, wet fruits, such as tomatoes and cucumbers, are usually packaged in a viscous material and cannot be easily removed. The best way to remove the sticky material is to place it in a bowl with a little water and let the mixture ferment (rot) a bit. This fermentation process melts the sticky material and improves the rate at which seeds are germinated. The seeds are then filtered out of the rotten liquid and dried.
6. **Some vegetables are more straightforward to extract than others:** tomatoes, peppers, cauliflowers, beans, peas. One of the easiest crops to save is individual plants fertilised by their own pollen.
7. **Blended pollination sometimes makes the process of obtaining seeds complex:** (cucumber, zucchini, squash, melon). Seed producers use different strategies to prevent this, starting with planting different varieties apart and placing plastic bags on top of some flowers to exclude unwanted pollen. However, the best and easiest way is to grow only one item at a time of these crops.

8. **Seeds must be fully ripe for extraction.** You have to wait until the seeds are fully mature before they are harvested. If the harvest is complete before full maturity, the seed will not germinate. Usually, the optimal maturity of the seeds is delayed from the optimal maturity of the crop. For example, the seeds of beans and peas are not ready to be harvested until the horns are brown, dry, and begin to break. Some vegetables (cucumbers and eggplants) must not be picked to obtain their seeds until they are fully mature and the fruit starts to wither and rot.
9. The seeds need to be completely dry in order to be kept safe for planting in subsequent seasons. Drying the seeds is the final stage of maturity, and this ensures that the seed will not rot while you wait to grow it next year. Most seeds are dry out on the parent plant, but if the weather gets wet and cold before that happens, you'll need to bring them in to finish the process. And there's a simple test to determine whether the seeds are dry enough or not, push a nail inside them. If the nail comes in, they're not dry yet.
10. **Adequate dry seed storage:** Dry seeds must be placed in paper envelopes or seed packs, with the name of the variety and the date of harvesting, after which the seed bags are placed in a glass container in a dark and cold place. In this way, seeds can remain germinable and lifeless for a few years, and some seeds can last for a decade or more.

Section 2: The steps of extracting and preserving seeds (choosing seeds, choosing plants, extracting and preserving seeds).

6. Having covered the seed production, extraction and conservation in the first section, we will now cover how to extract and save seeds. Can you explain to the listeners, especially the fellow farmers, who are interested in the extraction and preservation of the local vegetable seeds that they plant in their home gardens, the most important practical steps for the extraction and conservation of seeds?

Practical steps for extracting and saving seeds can be summarised as:

- ✓ Picking the correct plants to grow
- ✓ Selecting the best plants to extract seed from
- ✓ Extraction and sorting of seeds from selected plants

- ✓ The preservation of seeds from the extraction and sorting processes

7. How does a farmer choose seeds for a farming process to extract and preserve seeds?

It is imperative to know the origin of the varieties you will plant in your field. When choosing the varieties from which you plan to produce seeds, do not use hybrid seeds (F1 or F2), genetically modified seeds developed by seed producers, or seeds developed through biotechnology.

This is because the cultivated plants of hybrid seeds F1 and F2 will not produce plants that resemble them. They can produce plants with unexpected and unwanted characteristics, which can also be sterile. All of them are protected under plant property rights and patents.

To start producing your own seeds, you need seeds of local (non-hybrid) varieties, and if possible, from organic farming or eco-friendly agriculture.

8. After selecting the seeds and planting them in the field in the place designated for the extraction of seeds, the farmer is watching the cultivated plants and wants to choose the right ones to get the best seeds. Could you, our Dear Doctor, explain to this farmer and the listeners how best to select the plants we will get the seeds from?

It's crucial to pay close attention, monitor them through their development and select carefully because they will produce the next generations of fruits and vegetables.

The fundamental thing to know from the beginning is what qualities we want. Over time and across generations, species will evolve, and some qualities will become less apparent or vice versa.

The selection of plants cannot be based solely on the characteristics of the fruit because it does not reflect all the features associated with the development of plants. Selection criteria should be precisely defined since they will determine the plants for the production of seeds.

You shall first and foremost observe the specifications of the variety, such as pest resistance (diseases and insects), production quantity and early or delayed maturity of the plant, in addition to the subjective characteristics of the fruit, such as shape, taste, colour and conservation ability. The resilience of plants to their environment, drought tolerance and farming methods must also be taken into account.

It is essential to mark plants intended to produce seeds, to distinguish them from those planted for food consumption. It is a good idea to draw a map of the field indicating the location of each item to find if the tag or stickers are missing.

The whole cycle of sown seed production plants is often longer than those grown to consume their fruit. For example, you can eat lettuce after two or three months of planting it, but it takes five to six months to reach seed harvest.

There are many birefringent plants, such as carrots, that bloom and produce seeds in the second year of the growing season. A small corner of the orchard intended for seed production is preferable.

9. How are the seeds extracted and sorted from the plants chosen?

The process of extracting and preserving seeds is as follows:

1 – Method of extraction and wet sorting with fermentation: This method is used to extract and sort seeds from aquatic fruits, such as tomatoes and cucumbers. The seeds are enclosed in a thick casing that prevents them from germinating; the fermentation process allows the removal of the surrounding gelatin packaging from each seed. The process is as follows:

- The fruits of the tomato or cucumber, which have been chosen after full maturity, are cut in half. Their seeds and juices are extracted with a spoon and placed in a transparent glass container, which allows the fermentation to be monitored; a little water and sugar can be added to activate the fermentation process). Be sure to write the date and name of the plant that is being fermented.
- Do not close the glass vessel tightly. Cover it, protect it from insects with a net, and put it in a warm (22–30 degrees Celsius), shaded place, away from direct sunlight.
- The time required for fermentation varies according to the prevailing temperature and the amount of sugar in the fermentation fluid.
- A white mould layer may appear on the surface of a solution, and you must shuffle it several times to ensure that the fermentation process for all the seeds is complete and avoid forming a very thick layer of mould on the top.
- Fermentation needs to be monitored continuously. The fermentation process can end in two days, especially on hot days, but if the seeds are left long, the seeds that have lost their gelatin cover will begin to germinate (these seeds are now lost).

- When fermentation is complete, the intact seeds fall into the bottom of the glass receptacle, while the residue from the gelatin casing and damaged seeds float to the surface. The intact seeds at the bottom of the glass receptacle are then taken and cleaned in a filter or underwater sieve.
- Then it's essential to dry the seeds for at least two days. Place them on a thin sieve or dish in a warm, dry and well-ventilated place (between 22°C and 30°C).

II. Method of extraction and wet sorting without fermentation: This method is used to extract and separate seeds from fruits such as eggplant, peppers, squash, pumpkins, zucchini and watermelon. The process is as follows:

- The selected fruit is picked after maturity, peeled and cut into cubes, and then placed in a bowl with water (blended in the blender for a few seconds). Good seeds will settle to the bottom of the container.
- If the seeds do not easily separate from the core, they can be soaked in the water for 12– 24 hours, in a cold place (to avoid fermentation) and shaded until the seeds are separated from the core.
- Release the layer that floats at the top of the container, containing pulp, residual scaling, and unripe seeds using a filter (sieve).
- Take the good seeds that are located at the bottom of the container, and clean them in the filter under running water. Then it's essential to dry the seeds in at least two days. Place it on a thin sieve or dish in a warm, dry and well-ventilated place (between 22°C and 30°C).

3– Method of extraction and dry sorting (study and appraisal): This method is used to extract and sort dry seeds such as beans, peas, and most leafy vegetables. The process is as follows:

- The fruit is picked after maturity when the horns become brown and dry and begin to break.
- Large seeds are peeled manually like beans and peas; you just have to remove the strange and damaged seeds.
- Small-sized seeds are separated from their peelers. A coarse sieve is used first, the openings of which allow the seeds to pass without the larger straw. The process is

repeated many times with a sieve with smaller spaces, after which a soft sieve is used, which holds the seeds and allows the passage of other exotic materials.

- The seed is placed in a flat container and blown slightly. A steady wind or small fan can also be used in the culmination process to separate the seeds from other impurities.

10. So nice now that a farmer has reached the seeds that he needs to plant in the subsequent seasons – but the question is, how can these seeds be appropriately kept so that they remain arable and reproducible in subsequent seasons?

- 1– After drying, place each type of seed in a separate paper envelope bearing the name of the item or type and the preservation date.
- 2– Store seeds away from heat, moisture, and light in a glass container or a plastic bag. A garlic head can be placed in the pot to draw moisture and expel insects.
- 3– You can save the seeds for 2–5 years before planting them, and to increase that time, keep the seeds in the refrigerator.

Part 3: Examples of extracting and preserving seeds of some vegetable crops (tomatoes, eggplant, peppers, cucumbers, peanuts and lettuce).

1. tomato:

Tomatoes belong to the Solanaceous family (Eggplant) and are orbital plants in temperate countries. There are thousands of varieties of tomatoes that vary in colour, shape, size, taste, long growing season, early maturity and adaptation to cold, hot or wet conditions.

One of the most important local (municipal) tomato varieties is:

- 1– **Coastal 12:** An indefinite variety of fruits, hard and spherical, large in size (about 200 g), red, and of vegetation yielding about 6 kg.
- 2– **Al–Sharqi:** A finely grown variety of fruits, either spherical in shape, medium (about 100 g), or red, with a unit plant yield of about 4 kg.

III. Species of Harajel, Majdal Maosh, Dhahr al–Jabal, Barih, Biskenta, Kafr Silwan, Daraa, Wariyat, Gerdi and Basfeir:

Some of the fruits are large (Harajal, Dhahr al–Jabal, Wariyat, Busayer), some are small (Daraa al–Saghirah), and they range in colour from pink to orange and red. The

productivity ranges from 6895 kg/dunum for the species and 2206 kg/dunum for the lowest production.

- **Pollination:**

The flower is self-pollinating, that is, the masculine and feminine organs are located on the same flower. The occurrence of cross-pollination is rare. Including other flowers in the garden helps to prevent cross-pollination, as bees prefer to visit them. If there is little wind, shake the plants several times a day to increase the chances of self-pollination. To avoid cross-pollination of varieties in temperate zones, you must leave a distance of approximately 9 to 12 meters between the cultivated varieties.

- **Lifecycle:**

Tomatoes are arable (in temperate zones) and are grown to obtain their seeds in the same way they are farmed for food consumption. Tomatoes in premature varieties need at least 40 days after a flower is opened until the fruit is fully ripe. This period can last for 60 or 80 days in intermediate or late-ripe varieties.

Plants observed throughout the growth period and meeting the required criteria are selected.

With regard to plants, look for strong and regular growth, early or late maturity, multiple flowers and good fruits (you also have to taste the fruits and see if they are sweet or sour). Depending on the fruit, the ideal properties are the size, the colour of the core and crust, and the number of lobes inside the fruit.

Tomatoes must be harvested for seeds from healthy plants when the fruit is fully ripe. It is best to choose the first or second group of flowers. Tomatoes can also be harvested late in the season if the plants are well resistant to disease. To ensure good genetic diversity within a species, harvest tomatoes from 6 to 12 different plants. Do not harvest from diseased plants or damaged tomatoes.

- **Extraction, sorting and storage:**

Extraction, sorting, and storage go as follows:

- ✓ Choose ripe, non-rotting fruits (depending on properties and specifications required).
- ✓ For small quantities of seeds, the fruit is cut, and seeds and a part of the pulp are placed in a glass container using a spoon.

- ✓ To get more seeds, or for cherry or wild tomato varieties, slice the fruit and blend everything into the blender.
- ✓ Each tomato seed contains a quasi-gelatinous casing, which prevents the seeds from germinating (you must use the fermentation method to separate the skin from the seeds).
- ✓ After water-based seed-processing, it is necessary to immediately dry the seed in a dry, shaded and well-ventilated area.

Another way to do small amounts is to dry them on paper coffee filters because they are too absorbent, and the seeds do not stick to them. Place a small spoon of seeds at most on each filter. Hang the bags on the washing line in a dry, well ventilated, shaded and warm place.

- ✓ Store tomato seeds away from heat, moisture and light in a glass container or a plastic bag. Don't forget to insert a sheet indicating the year of production, type and item.
- ✓ Tomato seed has a capacity of 3 to 6 years. To prolong this period, keep the seeds in the refrigerator.

2. Eggplant:

Eggplant is a member of the Solanaceae family. It is a mild-zone orbital plant with varied size, shape, and colour.

Among the most important types of local eggplant (municipality) are:

1- Abacus diridis (black):

Its cultivation is widespread in Deir al-Zour, Raqqa, Damascus, the coast and elsewhere. It is a medium-premature class with a long harvest season and high production. Its plants are large, tall, and have medium, sweet, dark, and shiny black fruit.

2- Eggplant (Homs):

Cultivation of this type occurs in many areas of Syria and varies in name from region to region. The plant has several different names (Tathifi, Homs, Baladi, Abyad, Ahmar, etc.). Its plants are characterised as medium-height, and the fruit is usually wide-branched. The fruit is a long egg and varies in size from small to very large. It is a white colour with a light scarlet colour.

3- Eggplant (darkoshi):

Cultivation of this type is widespread in some parts of Syria, especially in Hama, Idlib and other areas. It is a late-matured, average-productivity species with a long, pink, medium-sized variety of fruits, used mainly for stuffing and cooking.

There are other local varieties of eggplant, including black eggplant with large fruit, which is best for grilling. It is desirable in the coast, long red eggplant (alkalawi or papa), and eggplant Abu turas, which use a cup to cover more than half the fruit and is highly desirable for the stuffing animals.

- **Pollination:**

Eggplant flowers are pepperminous, that is, the masculine and feminine organs are on the same flower, so it is said that the flower is self-pollinating. Pollination or hybridisation can occur between varieties depending on the surrounding environment and the number of pollinated insects. Shaking eggplants several times a day without wind increases self-fertilisation. In temperate zones, in order to avoid (cross) cross-pollination of eggplant species, you should leave a safe distance of about 100 meters. Mechanical insulation could be used, such as the use of bed nets.

- **Lifecycle:**

The eggplant is grown to obtain seeds in the same way as it is grown for food consumption. To ensure good genetic diversity, cultivate 6 to 12 different plants of each species. After a flower opens, we need 60 or 100 days until the fruit is fully ripe for food consumption (seeds are not yet ripe). Healthy, strong plants observed throughout the growth period that have achieved the required standards are selected.

In terms of vegetation, look for active and regular growth, many flowers and good fruits and the ability to adapt to a cold climate.

Depending on the fruit, you choose the fruits characterised by a distinct flavour, an ideal shape for the variety, optimal size, inner colour, skin colour, thickness, and lack of bitter taste.

You must harvest eggplant seeds from healthy, uninfected plants. When the fruit is fully matured, it becomes soft and changes colour; white eggplant becomes yellow, and purple eggplant becomes brown. If the fruit does not have time to mature on the plant, it can be placed in wooden boxes in a cold, dry place to complete its maturity.

- **Extraction, sorting and storage:**

Extraction, sorting, and storage are as follows:

- ✓ To extract seeds, choose fully ripe and non-rotting fruits (depending on properties and specifications).
- ✓ There are two ways to extract seeds. To get small amounts, cut the eggplant into four pieces and remove the seeds with a knife. For large quantities, peel the eggplant into cubes and place it in a bowl of water. Mix for a few seconds, after which the good seeds will settle to the bottom of the bowl.
- ✓ Release the layer that floats at the top of the container, containing pulp, residual scaling, and unripe seeds using a filter (sieve).
- ✓ Take the good seeds that are located at the bottom of the container, and clean them in the filter under running water.
- ✓ Then, dry the seeds for at least two days. Place them on a thin sieve or dish in a warm, dry, well-ventilated place (between 23°C and 30°C), and for the small quantities of seeds, use a paper coffee filter because the seeds won't stick to it. Place a small spoon of seeds at most in each filter, hang the bags on the washing line in a dry, well ventilated and shaded place.
- ✓ Type the name of the item, types, and year of production on a label placed inside the bag.
- ✓ Putting seeds in the fridge helps kill parasite larvae.
- ✓ Eggplant seed has a capacity of 3 to 6 years. To lengthen this, keep the seeds in the refrigerator.

3. **Pepper:**

Peppers are members of the Solanaceous family (BSE), a temperate plant of the Oholi. Thousands of varieties exist among them, including chilli peppers. They vary in size, shape, and colour of the peppers.

One of the most important types of local (municipal) peppers is:

1- Local peppers (papia):

A country class with a polygon-shaped fruit of 4 heads, the fruits of which are suitable for direct consumption and pickle-making. The productivity in open agriculture is estimated at 3-4 tons/dunums.

2- Sugar peppers:

Its cultivation occurs mainly in the city of Aleppo. Its fruits are small compared to other varieties, with a slight wrinkle, a polygon to three sides and a distinctive taste. The head of the fruit is thin (unpointed). There are two kinds. The first has a dark green colour, a thick, heavy-edged peel, and the second, with a light green colour and a soft skin, are less common than the first and are usually used in the pickle industry.

3– Rhino Al–Ghazal:

Abundant production, cultivated mainly in Aleppo and Idlib, has long, curly, thin and end-pointed fruits and a green colour that turns red after maturity. Productivity in exposed agriculture is estimated at 4–8 tons/dunum.

4– Antakli class:

Half of the average production estimated productivity in exposed agriculture 5–6 tons/dunums.

- **Pollination:**

Pepper sprouts have self-pollinating flowers. However, flowers can also be fertilised by insects such as bees. The process is susceptible to temperature changes. If the night temperature is too high (29 degrees) or too low (5 degrees), the pollination process will fail. The best time for pollination is when the night temperatures are between 12 and 15 degrees Celsius. To encourage self-pollination, you can shake plants regularly during flower season. To avoid the blending of two species in a temperate climate, leave 100 meters between them. This distance can be reduced to 50 meters if there is a natural barrier. To avoid cross-pollination by insects, you can also isolate plants using nets, either in a tunnel or under a permanent mosquito net. But be careful, but remember that the peppers need a lot of light.

- **Lifecycle:**

Peppers need a lot of heat to grow well. It is sown for its seeds in the same way it is grown for food. Grow 6 to 12 plants of each species to ensure good genetic diversity. Once a flower opens, it will take 60 to 100 days, depending on the species, for the fruit to be ready for consumption. The plants you select to produce the seeds must be intact and strong. Observe them throughout their development to find the plants that meet the desired selection criteria. For plants, look for stable and strong growth, many flowers, and branches that don't break. For the fruit, look for the best taste, size, colour, pulp and skin.

To harvest seeds, wait until full maturity when the green fruits are red, brown, orange or yellow. The pale yellow fruit becomes dark yellow, orange, or red. At this point, the seeds are yellow and ripe.

Do not pick out immature fruits because their ability to germinate will be much lower. It is best to harvest seeds from the first ripe fruits of a plant. Those taken from later fruits tend to have lower rates of reproduction. Do not harvest seeds from disease–stricken peppers and insects.

• **Extraction, sorting and storage:**

Extraction, sorting, and storage are as follows:

- ✓ It is important to extract hot pepper seeds in a well–ventilated place and, if possible, outside to avoid the emission of capsaicin (which can irritate eyes, throat and nose). It is also important to use thick rubber gloves and even goggles.
- ✓ Cut the peppers in two and remove the seeds with a knife, then place them in a bowl full of water, and the empty seeds will float. Remove them by sieve (sieve), then clean the good seeds in the sieve under running water.
- ✓ Then it's essential to dry the seeds for two days. To do this, place them on a thin sieve or dish in a dry, well ventilated and warm place (between 23°C and 30°C).
- ✓ Another way for small amounts is to dry them on the coffee filters because they're very absorbent, and the seeds don't stick. Place a small spoon of seeds at most on each filter. Hang the bags on the laundry rope in a dry, well ventilated, shaded and warm place. Avoid sun exposure of seeds, and do not dry them on paper that they can stick to.
- ✓ Type the name of the item and the year on a label, and put it inside the bag.
- ✓ Putting seeds in the fridge helps kill parasite larvae

- ✓ They will keep from 3 to 6 years. To lengthen that, I keep the seeds in the fridge.

4. Option:

The cucumber is a herbivorous plant of the squat family. The plant is a rapidly growing root with a large number of side roots. The stem is coarse and slightly branched, varying in

length from 1.5–4.5 meters (by species). The leaf is simple and broad with five lobes, and on the leaves are dense barbs. The fruit is a cylindrical oval, varies in size by variety, and is smooth or has small warts, a green or a yellowish–green at maturity for nutritional consumption. At maturity, it is yellow or brown. The seeds are small, pointed at both ends, and are often white.

- **Pollination:**

Flowers in the single–sex, single–dwelling cucumber means that it contains masculine and feminine flowers in the same plant. Feminine flowers have ovaries under the flower, and masculine flowers are the first to appear and are at the end of the long legs. Cucumber can self pollinate, which means that pollen from a male flower of the same plant can fertilise the female flower. Still, mixing is more common (insects, especially bees, pollinate cucumbers). To avoid cross–pollination when propagating cucumber seeds, keep a distance of 1 kilometre between two varieties. You can reduce this distance to 500 meters if there is a natural barrier.

There are several ways to produce seeds from different kinds of cucumbers planted in the same garden, and one of them is to cover a whole bunch with a grid and put a little beehive inside, and you can also pollinate flowers manually. This is more difficult than with zucchini and squash because cucumber flowers are much smaller.

- **Lifecycle:**

The cultivated cucumber is grown to produce seeds the same way as the cucumber is grown for food consumption. At least 6 plants are needed to ensure good genetic diversity. Pay particular attention to selecting the plants that you hold for seeds according to the specific characteristics of the species. You must keep the strong plants that have produced a good variety, get rid of the sick plants, and remember that the time of the cucumber for seed production is not the same for food consumption (we generally eat the immature fruit). To produce seeds, it is essential to let the cucumber grow until it is fully mature. It must have grown to its full size, and its colour must change. You can also harvest the fruit shortly before maturity. In this case, put it in a warm place and let it mature (this technology increases the fertility of seeds).

- **Extraction, sorting and storage:**

Extraction, sorting, and storage occurs as follows:

- ✓ To extract seeds, cut the plant open, extract the pulp with the seeds and let the mixture ferment for a few days, which will remove the sticky packaging surrounding the seeds.
- ✓ You then have to clean the seeds under the running water using a sieve. To get rid of the empty sterile seeds, place all the seeds in a water-filled bowl. The whole and heavier seeds will fall into the bottom, and the empty seeds will float. Remove the empty seeds, and wash the good seeds. Dry them in a well-ventilated area, rub them together to separate them. To make sure the seeds are completely dry, they must break if you try to fold them.
- ✓ Type the name of the item and the type, as well as the year of harvest, on a label that is placed inside the bag.
- ✓ Leave the seeds in the refrigerator for a few days to kill any parasites stuck in them.
- ✓ Cucumbers have a vegetable capacity of up to 6 years, sometimes longer. This can be lengthened by being stored in the refrigerator, and a gram contains 30 to 40 seeds.

5. Beans:

Beans are grown mainly to obtain their seeds, which are of different sizes and colours. They are used as human food, animal fodder and can be grown for their greenhorns.

• **Pollination**

Bean flowers are self-fertilising, but there is a risk of cross-pollination (blending) between different species by insects. The ratio of blending (5 to 60%) varies by species and environment and whether there are natural barriers. To avoid cross-pollination, plant different varieties a kilometre apart. You can cover the plants devoted to the production of seeds with a grid before the flowers start.

• **Lifecycle:**

Bean is grown to obtain its seeds in the same way as the grains used for food. Beans don't like high temperatures, as it stops pollination and reduces production. Thus, we recommend that you grow beans between the end of fall and the end of winter. It is necessary to produce at least 10 seed beans. Select plants according to the various criteria, such as plant size, flower colour, number of horns, number of seeds per century, size, colour and taste. As plants develop, choose the best, healthiest, most productive plants to produce seeds.

The length of harvesting is also a selection criterion. You must keep a portion of the harvest to produce seeds and keep no grain until full maturity. Avoid harvesting the first centuries of consumption and keep the last centuries of seeds because the seeds of the first centuries will preserve the early properties of the species.

If the weather is wet, harvest the seeds before they are fully mature and let them dry in a dry, well-ventilated area. But most of the time, plants can be left to dry (the horns become black). Remember, there were always the best seeds from the first centuries left at the base of the plants. To make sure that the seeds are completely dry, bite one seed, or press it with your nails and if that doesn't leave any mark on the seed, it's completely dry.

- **Extraction, sorting and storage:**

Extraction, sorting, and storage are as follows:

- ✓ After making sure that the seeds are fully mature, harvest the plants used to produce and preserve the seeds, and place them on clean, soft land.
- ✓ Extract seeds from the horns, exclude those of a different type and remove damaged grain and exotic grain.
- ✓ After ensuring the seeds are dry, put them in the refrigerator for a few days to eliminate all the trapped parasites.
- ✓ Place a sticker with the item's name and type, plus the year, inside the package. Store bean seeds away from heat, moisture and light in a glass bowl.
- ✓ Bean seeds have a plant capacity of 5 to 10 years (which can be extended by being stored at low temperature).

6. Lettuce:

Lettuce is a grass plant surrounding the compound family. One of its chief characteristics is the ability to adapt to all climatic conditions. Both types of lettuce are grown at least several meters from each other in temperate zones and at a greater distance in hot zones. You must plant seeds early enough that the plant has time to produce the seeds (4-5 months).

- **Lifecycle:**

Lettuce is grown for seeds the same way as lettuce is grown for food. No less than ten seed plants are necessary to maintain good genetic diversity. Particular plants are chosen for the variety, such as shape, colour, or growing season. Winter lettuce is grown during the

cold time of the year, and seeds are produced the following spring. Thus, it maintains its low temperatures. You must remove plants that do not have specific properties.

Certain types of lettuce have difficulty pushing the seed leg through the head, especially when the head is very compressed. Sometimes you can help them by cutting a + in the upper part of the head carefully so the soft growth bud is not infected. You can remove the leaves surrounding the heart one by one. Leaves tend to rot when the weather is wet (when this happens, they should also be removed).

Flowering lettuce can reach an average height of 1 meter and must be covered individually or in groups. Depending on environmental conditions, it takes 12 to 24 days for seeds to be formed after they open. Lettuce flowers bloom gradually so that not all seeds are ripe at the same time.

The maturity of seeds is determined by harvesting a wilted head and crushing it between the thumb and forefinger. If the seeds don't separate and remain stuck inside the head, they must mature further. When seeds fall easily from the head, they're ready to harvest. The seeds can be harvested in many ways. Put a bucket or sack under the head of the seed and zoom in until the seeds fall.

It is also possible to wait until at least half of the plants are mature and then cut the legs of the flower into a large woven bag. Hang the bag in a dry, well-ventilated place. The seeds can thus finish maturity on the plant.

In the event of bad weather conditions during maturity, the third possibility is to uproot plants, place a bag around the roots to prevent soil and rocks from mixing with seeds, and upside-down the plants in a dry and well-ventilated place.

- **Extraction, sorting and storage:**

The Flower Legs must be completely dry when removing the seeds. The peak is rubbed by hand, and the majority of the seeds come out easily. A flower stalk can also be beaten in a box or other large container, after which the seeds are sorted using sieves of differing mesh size. Finally, seeds must be sieved to remove any remaining impurities.

The seed is then placed in a plastic bag. Put a label with the name of variety, year of production and the place where it was grown. Storing seeds in a freezer for days kills

parasite larvae. Lettuce seeds may be preserved for an average of 5 years and even 9 years or more if they are kept in the refrigerator. A good seed plant can easily produce 10 to 15 grams of seeds.

Tips and Guidelines:

- ✓ **The extraction and conservation of seeds should only be of your best plants:** Keep seeds only from your healthy, disease-resistant, insect-resistant, and growth-strong plants, which have a high capacity for adapting to their environment (drought-tolerant), as well as fruit-specific specification such as shape, taste, colour, preservability, taste and flavour.
- ✓ **Avoid saving hybrid item seeds:** They are for cultivation only for one generation; if they are stored, they will not produce plants that resemble them; or they can produce plants with unexpected and undesirable properties. Their seeds can also be sterile.
- ✓ **Seeds must be fully ripe for extraction.** You have to wait until the seeds are fully mature before they are harvested. If the harvest is complete before full maturity, the seed will not germinate. Usually, the optimal maturity of the seeds will be after the optimal maturity of the fruit.
- ✓ **Seeds newly recovered from the fruit should not be subjected to direct sunlight:** The seeds are dried over two days. Place it on a thin sieve or dish in a warm, dry and well-ventilated place (between 23°C and 30°C).
- ✓ **Adequate dry seed storage:** Dry seeds must be placed in paper envelopes or seed packs, with the name of the variety and the date of harvesting, after which the seed bags are placed in a glass container in a dark and cold place.
- ✓ Local seeds represent the common heritage of all at all times and in all places, and all must protect this heritage so that it will continue to bear fruit in the future and be passed on from generation to generation.

Recommendations:

- ✓ The organisation of numerous training courses for farmers and agricultural engineers continuously to provide them with the expertise and skills necessary for the multiplication and conservation of municipal seeds.

- ✓ Prepare more agricultural manuals and brochures on municipal seeds and their importance in achieving food sovereignty in local communities.
- ✓ Encourage farmers to provide municipal seeds from the seasons they plant.
- ✓ Periodically communicate with farmers and hold regular meetings with them to learn about the conditions of municipal agriculture.
- ✓ Work to spread the culture of local products through exhibitions and agricultural days.
- ✓ Work to provide local seeds by the supporting entities and provide them to farmers free of charge.

Conclusion:

Syria's local seed is a vital national resource that must be preserved, because of its local plant genetic resources and its significant, direct and indirect, role in combatting agricultural pests. Their use will reduce the use of chemical substances and maintain the environmental balance. It is, along with water, the key to food sovereignty (the right of states and individuals to produce food themselves, through access to control of the basic resources in this field, water and seeds). In doing so, we will contribute to preserving a common heritage that has been developed over countless generations and is rapidly disappearing.