

A Visual Treat into Organic production of Open-pollinated seeds and Seed Extraction



Open-pollinated varieties of vegetables,...

- which are not hybrids F1
- which are not genetically modified

Open-pollinated varieties:

- produce fertile seeds
- reproduce true to type

provided they are isolated for the
purpose of giving pure seeds



Maintaining Varietal Purity

To produce pure seeds,
we have to avoid cross-pollination



The pollen may be transported by wind,
by birds or by insects



Cross-pollination happens mainly
between varieties of the same species,
for example:

- between 2 varieties of tomatoes
- between 2 varieties of corns
- between 2 varieties of brinjals
- between 2 varieties of cucumbers



Red tomato crossing
with orange tomato may
give “pineapple” tomato



A cucumber can not cross with a pumpkin



A cucumber can not cross with a melon



A watermelon can not cross with a melon

Techniques adopted

Pot mixture



Seed sowing



Seed beds- Seed trays



Transplanting- planting



Care, Sun light and moisture



Seeds of Tomatoes

Scientific name: *Lycopersicon lycopersicum*,

Family: Solanaceae





Flower of tomato with a prominent stigma inducing a bigger risk of cross-pollination



Flower of tomato pollinated by a wild bee inducing cross-pollination and loss of purity



Maintain Varietal Purity of Seeds
Isolation of different varieties with mosquito nets to
prevent cross-pollination at Seed Bank in Auroville

SEED SAVING TECHNIQUES



Extraction of seeds of tomatoes
with their juice

Tomato

- The jelly like substance containing the seeds is placed in a container or bottle to ferment
- It is then left for 3-4 days until a moldy layer forms
- Seeds are then washed and dried
- Viability of seed is about 4-8 years





The seeds are spread on a mesh to dry in a well ventilated place



Drying of the seeds
in the shade and
in a well ventilated
place

Tomatoes of many shapes and colors





Tomatoes in Tamil Nadu



Seeds of Capsicum and Chilies

Scientific name: *Capsicum annum*, *Capsicum chinense* & *C. frutescens*,
Family: Solanaceae





The mature color of chilies and capsicums may be yellow, red, purple, white, orange black or chocolate





The seeds of chilies and capsicums are removed when the fruit is totally mature with its full color according to the variety

Open Pollinated Capsicum



- Seeds are removed by hand from fully mature pepper, placed in a fine mesh and shade dried for 6 - 8 days under room temperature.
- Seeds are best preserved at Cool temperatures, 18-20C
- The mature fruit are of several variety-yellow, red purple white, Orange, black or chocolate
- The seeds have 4 years of viability.



Bhindis/ Okra

Scientific name: Abelmoschus esculentus

Family :Malvaceae



The flower of a Okra should be protected by a small piece of mosquito net to keep purity, before opening



Note: When the **flower** is already **open**, it is **too late**



The flower of a bhindie/okra is protected, before opening, by a small piece of mosquito net to keep purity



Seeds of Bhindies/Okra

Annadana
Soil & Seed Savers



- Produce flowers every 2 to 3 days
- Pods split when completely dry. Pods are easily hand threshed and seed separated. The seeds have 3 years of viability.





Seeds of Brinjals

Scientific name: *Solanum melongena*, Family: Solanaceae





Diversity of Brinjals





Diversity of Brinjals



Brinjal



- Brinjal otherwise known as eggplant is a warm season crop
- Requires long and warm growing season for successful seed production a day temperature of 25-32°C and night of 21-27°C is ideal
- Harvested only from fully ripe fruits, when the skin has turned brownish-yellow
- Seeds have an average viability of 6 years





Diversity of Brinjals





There are no cross-pollinations
in between species.

Cross-pollinations occur between varieties
within the same species.

For example, bees or flies or ants will cross-pollinate 2 varieties of *Cucurbita moschata* if they are not isolated



Cross-pollination with the bees

For example, bees or flies or ants will cross-pollinate 2 varieties of Cucurbita pepo if they are not isolated



Cross-pollination with the bees

For example, bees or flies or ants will cross-pollinate 2 varieties of *Cucurbita maxima* if they are not isolated



Cross-pollination with the bees



To avoid cross-pollination, it is necessary to isolate 2 varieties of the same species of squashes with 1 kilometer distance or practice hand pollination.

METHODS TO MAINTAIN VARIETAL PURITY



- BAGGING: Best suited for home gardeners since they require small amount of seed for planting their next crop
- Applied to perfect flower crops with high rate of self pollination, eg: chilly, eggplant, tomato



- Caging : The advantage of isolating an entire plant and so as to produce more seed.
Suitable for small scale farmer to cage and select from his best plants.



- Tunneling: Best suited for large scale farmer, institution, NGO, who require to produce a large quantity of pure seeds
- Covering different land tract each with mosquito nets before the flowering period to prevent cross pollination hence maintaining varietal purity



➤ **ISOLATION STRIPS:** A separate plot is allotted with a tall crop or nectar rich crop acting as a natural barrier or attractant. This separates plots planted for seed production preventing cross pollination and mechanical mixtures

➤ **ISOLATION DISTANCE:** Pure seeds are produced by leaving enough distance between the varieties to preventing cross pollination. Isolation distance varies from 50-1000 meters depending on the plant specie



Hand pollination



Male flower of squashes
before opening



Female flower of
squashes before opening



Male flower of
squashes after
opening



Female flower of
squashes after opening



Hand pollination



The flowers used for “hand pollination” are carefully taped in the evening, a day before, to prevent their natural opening early in the morning



The petals are removed from the male flower to give free access to the stamen and the pollen



The female flower is fertilized with the stamen of
the male flower
of the same variety



After the hand pollination is done, the female flower is gently taped again to prevent pollen contamination brought by bees from other flowers of other varieties



Following hand-pollination, when the female flower is taped, the young fruit is marked with a color string to keep track of the pollinated fruit which will give pure seeds



Cucurbitaceae Family

Scientific name: Cucurbita spp





Pumpkins are divided into 3 main species:

The orange-flesh is a source of beta carotene which is a powerful antioxidant. Beta carotene is converted to vitamin A in the body. Vitamin A is essential for healthy skin, vision, bone development and many other functions. Pumpkin is also a tasty source of carbohydrates and potassium.

- ▶ Cucurbita pepo
- ▶ Cucurbita maxima
- ▶ Cucurbita moschata

A few characteristics of Cucurbita



Notice this stem of
Cucurbita maxima is
corky



this stem of *Cucurbita moschata*
has up to 5 ribs only



Cucurbita pepo has up to
ten ribs



The foliage of *Cucurbita pepo* is prickly and may induce skin irritations

The foliage of *Cucurbita maxima* is not prickly



The foliage of *Cucurbita moschata* is not prickly and is often with white spots



Seed extraction



When the fruits are fully ripe,
the seeds are extracted



seeds being extracted manually



After extraction, the seeds are washed with water
to separate the flesh



When the seeds are thoroughly washed, they are dried on a mesh

Seeds of cucumbers

Scientific name: Cucumis sativus

Family: Cucurbitaceae





Female flower of
cucumber



Male flower of cucumber



Extraction of seeds
from very mature fruits of cucumbers



The mature fruits of cucumbers
are cut in halves



The seeds of cucumbers are extracted
and put to fermentation for a few days
in their own juice in a sealed container



The seeds of cucumbers are put to dry
on mesh and then threshed

Diversity of cucumbers



Diversity of cucumbers



Seeds of Melons





The seeds of watermelons are extracted, washed lightly and put to dry on mesh and then stored



After drying, seeds should be stored in a cool and dry place in hermetic plastic containers or glass jars.

Drying and storage



Ant bowl



Tropicalized fridge



Seed trays and cupboard



Dark colored jar

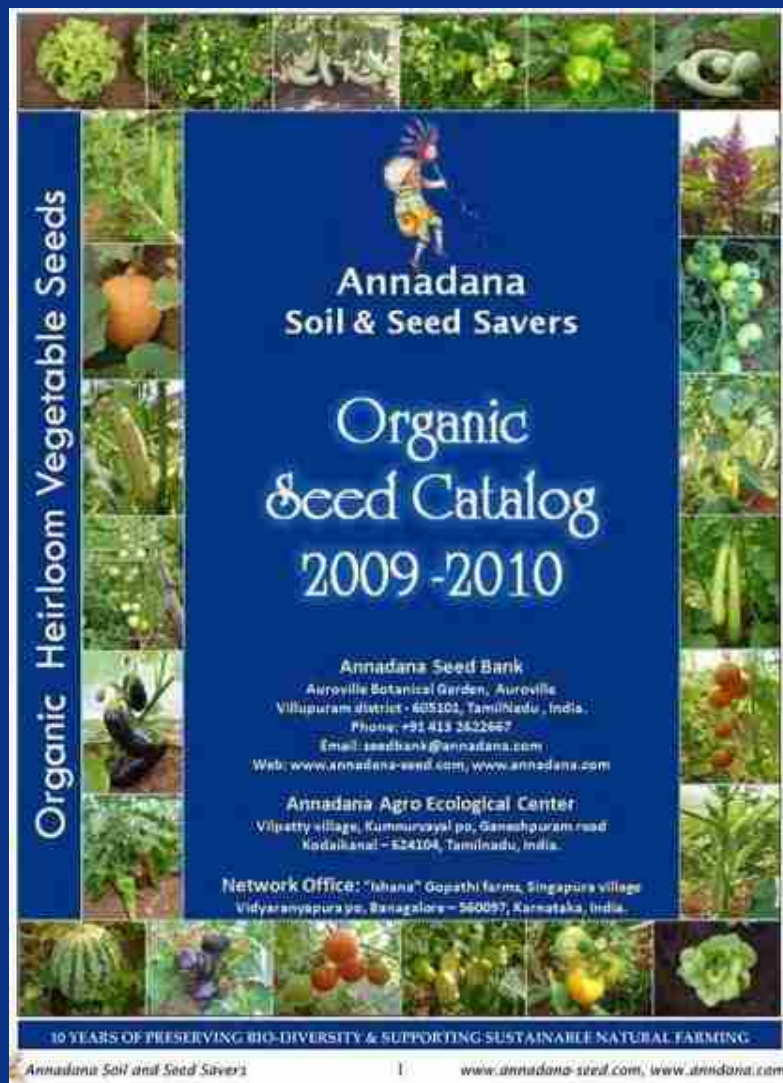


Annadana Seed Bank at Auroville, T.N. Solar operated





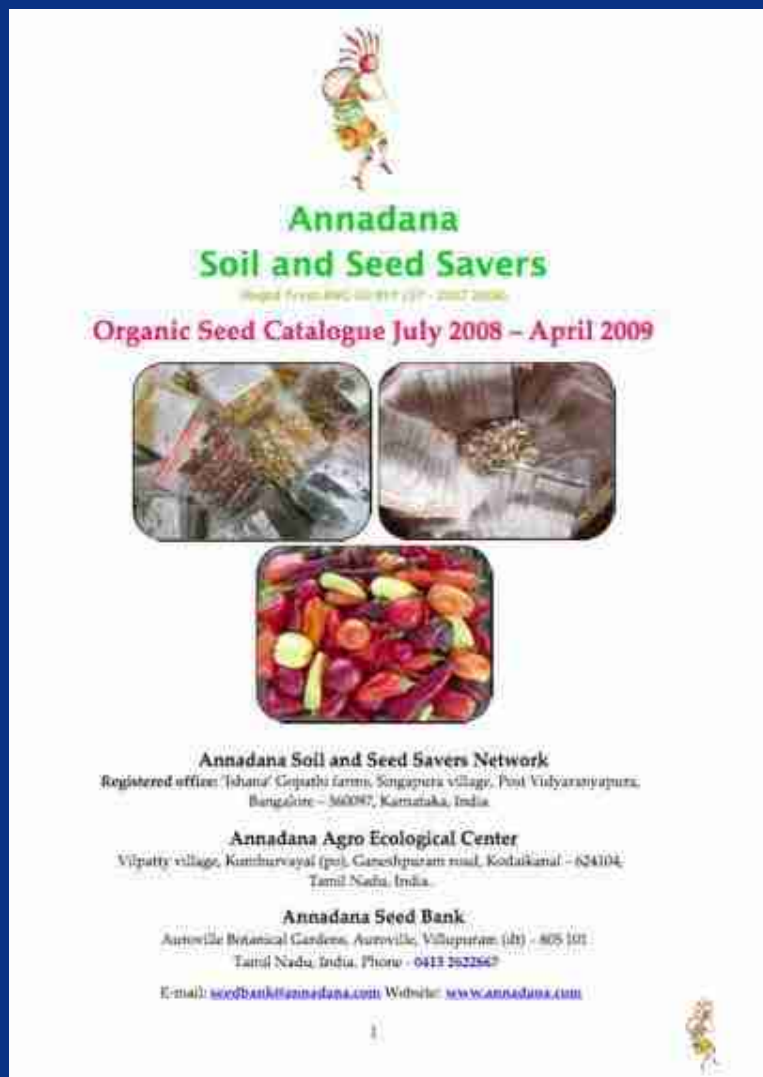
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Sign up to avail our visually documented technical safe set of farming practices in a DVD along with a Biodiversity gift of open pollinated organic seeds. (for Indian citizens only)



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Have a good Seed Saving journey ...



This presentation on seed saving has been simplified to be accessible to home gardeners and small scale farmers.

It is not suited for professional breeders.