

OPEN-SOURCE ACID EXTRACTION PROTOCOL FOR TOMATO SEED

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See www.realseeds.co.uk for possible updates

**Be careful! Use entirely at your own risk,
no liability is accepted for anything resulting from doing this.**

Home seed-savers: you do not need to do this.

This is for professional seed producers to process small batches of tomato seed.

Materials:

- 10% Hydrochloric Acid , often sold for cleaning brickwork prior to painting.
- Suitable containers for reaction: Pyrex / plastic bowls or buckets.
- Larger bucket for rinsing
- Hose/tap with cool water (not too cold though to avoid shocking the seeds)
- Large plastic sieve with fine enough mesh to catch tomato seeds
- Colander or Riddle with coarse enough holes to pass tomato seeds
- Digital scales accurate to 1gram to measure the acid (or Accurate graduated measuring beaker, a kitchen jug is not accurate enough)
- Digital scales suitable to weigh mass of tomato to be treated e.g 2kg range
- Disposable cups or pyrex glass for measuring acid
- Stainless or plastic stirrer – fork/gaint spoon or whatever
- Emergency bucket full of cold water (rinse acid splashes off immediately)
- Safety goggles
- Rubber gloves
- Plastic apron

METHOD:

SEE VIDEO DEMO AT [HTTPS://YOUTU.BE/XQ6OXPCAF4Y](https://youtu.be/XQ6OXPCAF4Y)

(OR SEARCH FOR “REALSEEDS TOMATO SEED ACID EXTRACTION VIDEO”)

REACTION

Chop or mash whole tomatoes, or cut in half and squeeze out seeds. Both methods work.

Weigh the mass you are about to add acid to.

Wear gloves, eye protection and plastic apron.

Measure out 75ml (=75 grams) of 10% HCL for each kg, it's best to do this by weight - accuracy is important.

Add acid to the mass in the bucket.

Immediately seal HCL container and place safely away, & thoroughly rinse measuring beaker.

Stir tomato-acid mix gently but well with a stainless implement.

Leave to react for 90-180 minutes (see below), stirring gently every 15 minutes.

TIMING

- 1) It varies a bit depending on temperature. At 30C it will need about half as long as at 20C.
- 2) If you are using mashed tomatoes it will go quicker than if using extracted seeds+gel, as large lumps of tomato have less surface area per kg.

So, for chopped / mashed tomatoes, about 120 minutes is likely to be right at 20C, whereas for squeezed out seeds about 120- 180 minutes is more likely to be right.

You are trying to digest off the gel coating from the seeds , and maybe damage the fuzzy hairs, but not eat through the seed coat itself. The time taken will vary from variety to variety. Have a poke at the seeds with a fork and see if the gel capsule comes away easily.

EXTRACTION

Very similar to the way you do this for the fermentation method:

First, if using mashed tomatoes

- 1. Place tomato mash in a riddle or colander – with holes big enough for seeds to pass through.*
- 2. Place colander/riddle over bucket*
- 3. Blast seeds off with water, through riddle, into bucket. Avoid splashing.*
- 4. Discard tomato bits into a large container, add lots of water to dilute any acid, then compost.*
- 5. Now take seeds in water and clean as normal:*

Put the tomato-seed-acid-goo in a large/tall container, with room to add water & swirl. Add large amounts of cool water, avoiding splashing, and stir well - seeds should fall to the bottom and easily come clean.

Pour off top ½ of liquid and bits of tomato. Discard.

Add large amounts of cool water again, and stir well.

Protective equipment no longer needed now.

Repeat until only seeds remain.

NEUTRALISATION

Acid will be absorbed into the seed coat and needs to be soaked out otherwise it will interfere with germination and seedling growth.

Decant seeds into sieve.

Place sieve across top of bucket/bowl full of cool water

Arrange hose or tap so that a small gentle stream of fresh water falls into the sieve, causing the container to gently overflow.

Leave this constant stream of cleansing water running for at least 60 minutes, or better, 120.

Lift out sieve and tap repeatedly on your hand to remove as much water as possible.

Turn out onto plastic chopping board and use sieve to spread out into a 1-seed layer.

Blot through sieve using towel to remove as much water as possible.

Place in cool draughty place to dry.

CLEANUP

Wipe down everywhere with a damp cloth, repeatedly, with much rinsing, to avoid transfer of any acid drips that may have escaped.

NOTES:

- This protocol is a suggestion only. If you do this it is your decision and at your own risk. Make sure you understand what you are doing and if you have any doubts as to your ability to do this safely, DO NOT PROCEED.

- If you use different acid strength, both the time and quantity will vary. E.g. using 5% HCL you need to double the amount per kg AND double the time.
- DO NOT USE CONCENTRATED HCL! Concentrated or industrial HCL is about 30-35% and can cause life-changing injuries in a couple of seconds. I have used the weaker acid, which while is only 1/3 the concentration has a far lower reactivity and is safer to use. If you splash 10% HCL on your skin rinse off immediately with copious water but it is not going to burn through to the bone the way the other stuff can. The real danger is to your eyes.
- I have experimented with 60 minutes and 90 minutes. Both had no effect on germination compared to controls, but the 60 minute treatment did not affect the hairs on the seeds. 90 minutes removed them a bit. We want to get rid of those for ease of packing, and it would be worth trying 120 minute treatments.
- There is talk of using organic cider vinegar as a Biodynamic method. Unfortunately if my maths is right the chemistry is such that it is about 85 times less reactive than HCL so would need approx. 6L vinegar /kg tomato and 4 days soaking to have the same effect.
- I have also experimented with 5% acetic acid as a treatment of already-dried seed, for treating old stock against virus. I am quite sceptical of this as the only mention online is for one particular pathogen, not sterilisation in general, and wonder if this has by chinese whispers been turned over time into a suggestion for all seedborne diseases. However I can confirm that for dried seed, up to 20 minutes soak in 5% Acetic acid causes no loss of germination.
- Likewise I have experimented with up to 6 minutes of 10% HCL on already-dried seed and saw no loss of germination. There was no damage to the hairs either, so longer treatment is probably safe, and further experiments would be useful. I do believe this will have destroyed any virus on the seeds.



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