

'Many of the new hybrid Belgian endive (aka witloof chicory) varieties are the result of this type of technique. A cell of a Belgian endive (*Cichorium intybus*) and a cell of a sunflower (*Helianthus annuus*) are taken and the cell walls are dissolved away with an enzyme. The chicory cell has its cytoplasm including its mitochondria irradiated and destroyed and the sunflower cell has its nucleus irradiated away. These two broken cells are then fused together into a single cell with electric shock stimulus or a special chemical. What is left is a new plant cell that is transgeneric if not transgenic. The cell is then grown in the laboratory into a plant and is then crossed to another plant to make it more likely to survive outdoors. The chicory nucleus and sunflower mitochondria don't quite like to be in one cell and create a plant that does not produce pollen and can be used to make hybrid seed. This is evolutionarily dubious and in the wild this situation would be evolutionary suicide.' (<http://www.seedambassadors.org>)

What is GE Seed ?

'GE (Genetically Engineered): The terms GE and GMO [are] frequently used interchangeably in the media, but they do not mean the same thing; it is modern Genetic Engineering that is the subject of much discussion. Genetic Engineering describes the high-tech methods used in recent decades to incorporate genes directly into an organism. The only way scientists can transfer genes between organisms that are not sexually compatible is to use recombinant DNA techniques. The plants that result do not occur in nature; they are 'genetically engineered' by human intervention and manipulation. Examples of GE crops currently grown by agribusiness include corn modified with a naturally occurring soil bacterium for protection from corn borer damage (Bt-corn), and herbicide-resistant ('Roundup Ready®') soybeans, corn, cotton, canola, and alfalfa.'

'GMO (Genetically Modified Organism): The USDA defines a GMO as an organism produced through any type of genetic modification, whether by high-tech modern genetic engineering, OR long time traditional plant breeding methods.' (<http://thedeliciousruth.blogspot.co.nz/2012/03/difference-between-terms-ge-and-gmo.html>)

OK so my understanding is that people who tell us there is no difference between GE and F1 Hybrid seed and Open Pollinated seed are missing some of the above info.

It is my understanding that F1 hybrid seed, CMS seed and GE seed are not seeds that are capable of growing nutrient dense food nor are they capable of creating a resilient food system or a regenerative ecological reality so badly needed today... They are part of the industrial system that is degenerating all life on earth.

And what about Glyphosate in our seed ?

Ok another big story...

It appears if we listen to Dr Don Huber the senior microbiologist who worked with the US government and Monsanto on glyphosate research for many years who is now is now telling us that it is in his opinion one of the the most dangerous things on earth and is registered with the patent office as an antibiotic and it kills all life.

If we grow a plant that has been grown in soils that has been sprayed or has GE material in its seed the glyphosate translocates to all parts of that plant including the seeds and also out into the soil where it remains once that plant has gone to remain alive in the soil to enter the next generation of plants and so on.. it travels and communicates just like microbes. The effect it has on our food plants is that it chelates the minerals out so that they can never be nutrient dense... on top of that it is killing the ability of the shikimate pathway in our gut to function normally creating gut havoc for humans as well as many serious allergies in young children. It is not any part of a regenerative system that we at Koanga are committed to creating around us and supporting others to create.

We have around 5% left of the heritage seeds we had 100 years ago, according to the W.H.O. whose research is now 30 years old and it's still getting worse. It is becoming clearer and clearer that these endangered heritage seeds will be a key part of our future.

**JOIN THE TEAM. HELP US SAVE OUR
NEW ZEALAND HERITAGE SEEDS.**

**Please support Koanga by joining the
team by becoming a member to help and
support us to save the seeds we have left.**

www.koanga.org.nz

Seeds

Some things to ponder...



www.koanga.org.nz

What is a Heritage Seed ?

The Koanga definition of a heritage seed is one that has never, to the best of our knowledge, been grown in the industrial system. It is a seed that has been passed on down for several, if not many generations in a distinct physical geographical area so that the seed is adapted to those local conditions and the people who grow and eat the food grown from those seeds.

Seeds are our cultural Taonga.

The number of generations or length of time the seeds have to be grown in one area or by a family/community is not exactly clear. My experience and body tell me it is three or more people generations, in one place or bioregion, and within one family/whanau/community.

Heritage seeds are only useful if they are adapted to our own ecology and bodies. Heritage seeds co-evolved in soils that were minerally dense and microbially active and a key characteristic of heritage seeds is that they are fully capable of communicating with the life in the soil and so then able to pull in the energy in the universe, to create high brix food, and so capable of fully nourishing human beings and actually all life that lives off them. (See *Nourishment Home Grown*, A.E. Beddoe, for the science of that).

All heritage seeds are open pollinated, by natural vectors e.g. bees or wind etc, in the open environment. Genetic diversity is maintained, as is resilience and strength to do well in a healthy alive environment... it is a process of co-evolution.

Seeds that are open pollinated and grown in a healthy ecosystem, remain strong for the future, resistant to pests and diseases, are able to communicate with their ecological system and they create a strong resilient future for our food base.

QUESTION...

Is a seed a heritage seed if it once used to be a heritage seed but has now been grown by multinational corporations for over 20 years in a climate very different to ours and sold all around the world?

QUESTION...

What is your definition of a heritage seed?

What is an Organic Seed ?

Koanga identifies 'organic' seeds as seeds that have been grown according to the organic standards, whether they are certified or not, which essentially means they have not been grown using any inputs that do not meet these standards. In organic standards there is no requirement for high and balanced level of minerals required to grow high brix crops or a requirement for high level of microbes... although it is acknowledged that microbes are critical.

What is HIGH BRIX Seed ?

Brix is a term that is a measure of the percent of solids in the sap of the plant leaf... it is the solids that create the sugars in the leaves that feed the plant and that the plants send out at night through their roots to feed the soil microbes so the microbes feed the plants. The plant sugars have a direct relationship with nutrient density (See *Nourishment Home Grown*, AE Beddoe).

High Brix seed is seed that has been grown in soil that has high levels of balanced minerals and a highly microbially active soil in such a way that the needs of the seed then plants are met so well, the plants grow to be high brix plants. Brix is measured with a refractometer, and anything over 12 or around 12 in some cases is beginning to become useful human food. Under these levels we have low brix food that is in nature the food of insects and fungi, they are attracted to the vibration of simple sugars which low brix food contains and they come and eat it. They have digestive systems that have evolved eating simple sugars they can not digest complex sugars which humans need. If we have pests and diseases in our gardens/fields it is not a sign of a deficiency of insecticide or fungicide, it is a deficiency of minerals, or they are unbalanced etc.

It is becoming recognized around the world through the fields of biological farming and the science of epigenetics that it is critical for human health and ecological health that we have nutrient dense food, and as of 2017 September it looks as though there will be an international certification system set up by the Rodale Institute in the USA to support those people wanting to either grow or buy high brix/nutrient dense food.

High Brix seeds germinate faster and have more potential to grow high brix crops... and critically if we are growing high brix food we are also growing soil, sequestering carbon and building ecological resilience.

If you are interested to learn more about this Koanga sells refractometers with all the required info, most places show you only how to calibrate the instrument, you need good instructions as well. If you'd like to know more perhaps a *How to Grow Nutrient Dense Food* workshop would suit you or our booklet *How To Grow Nutrient Dense Food*, or ask Kay questions at the 11:00am Thursday session on the Koanga facebook.

What is Open Pollinated Seed ?

Open pollinated seed is described above. All heritage seed is open pollinated but all open pollinated seed is not necessarily heritage, or organic etc or high brix.

What is F1 Hybrid Seed ?

F1 hybrid seed many will tell you is no different to open pollinated seed... sorry here are some of the differences:

F1 Hybrid seed is not randomly crossed out in the field by insects and the wind, it is grown in a laboratory and hand pollinated in such a way that the genetic diversity is narrowed and narrowed down so that the resultant plants have very specific characteristics, e.g. large heads. In the process of narrowing down the genetic heritage of these F1 hybrids we lose the resilience, the ability for these plants to grow and reproduce their own true to type seed, their ability to be resilient in the outdoors. They also hold enzyme blockers in their cells which means they are unable to pick up key minerals from the earth for the growth of a high brix or nutrient dense plant, or healthy human!

What are CMS Seeds ?

As if that is not enough we now also have CMS seeds that are labelled as F1 hybrid seeds (creep under the regulations through some loop hole) so that you don't know if you have an F1 hybrid or a CMS seed in your pocket, or in your shopping basket when you buy your organic food. Many of the brassica seeds grown by organic growers will be CMS seeds because that is how brassica seed is being grown these days.

I'm going to paste here a definition of CMS (Cytoplasmic male sterility) seeds because it is too horrendous for me to put it into my own words. This is an example of CMS endive but many vegetables seeds are being grown like this today especially brassica seed. Biodynamic growers are not allowed to use it but organic growers are???

Say no more...