



A NEAR-DEATH EXPERIENCE THAT LED TO A TECHNOLOGICAL BREAKTHROUGH, AND THE CREATION OF ECONOMIC OPPORTUNITIES

PART I – PERSONAL

A LIFE COURSE THAT ACCIDENTLY SHIFTED

This is a story about a life-changing event, which nearly cost me my life.

On that winter day of January 1998, I started spraying early in the morning, hoping to get as much work done as possible before the day is over.

My life after that day's spraying-accident, which sent me crushed-bones and paralyzed to the hospital, was completely different in so many ways from before.

The changes I had to do myself and the changes I later inflicted upon others are tremendous.

They touch the core essence of the pressing issues of our shared lives on this planet – *Food safety, Consumers' health, Environmental Sustainability, Poverty Elevation, Decreased Inequality, Fair Trade*, and more.

NOTE - Some of these issues are now defined as the UN Sustainable Development Goals.

Can one person really change the world?

I have multiple answers or perspectives. They all result in a "Yes."

My story is of a farmer, myself, who 'accidentally' changed his farming practices, only to find out that such new practices are practically about to positively impact the whole world, and change the lives of millions of farmers, and billions of consumers.

But not everything was accidental. There was a clear intention which started all this and – as I recognized later – was leading toward the accident, which only strengthened the goal, which I had in mind.

THE KING IS NAKED; BOTH REGIMES SPRAY PESTICIDES

The year was 1994, a few years before the accident.

For the past five years, I've been working hard on my farm to grow the best apples, pears, nectarines, cherries, and peaches one could dream about.

Yet, when the fruit dealer arrives, we get the same price as everybody else - the same price we received last year and the years before.

The following reflects the problems and thoughts I had running in my head in the '90s, while I was facing the challenges that every farmer is facing.

I had not given up on achieving better prices. I ask myself, "*what can I do to get a better price for my produce? How can I increase the income from my orchards.*"

Ninety percent of my orchards are 'Conventional', and the rest, 10%, are 'Organics'.

True, some of the pesticides we use are different, but we still spray pesticides under **both** cultivation regimes.

Nevertheless, the price we get per kg of Organic produce is twice, and sometimes more, than the price we get per kg of Conventional produce.

A NEW CATEGORY IS NEEDED

I asked myself, "what if I could get rid of most or even all of the pesticide spraying, and replace them with an effective non-spraying environmental friendly alternative?"

If this was possible, I could market such Conventional produce as **Eco-Friendly**; free of all or most sprays, free of chemical residues, free of pests, environmentally-friendly, and hence, **much more healthy to my consumers**.

Of course, I will need to specially **label** such produce, so that consumers will know how to distinguish between sprayed produce, i.e., Conventional and Organic, to the new kind of category; pesticide-free.

I am sure that people that are health-conscience and have environmental awareness will be happy to pay some more to consume produce that is in line with their values".

DON'T PREACH, MAKE THEM LOVE IT

We continuously pitch farmers to spray less. But they don't.

However, farmers will quit spraying IF they will get their 2 IF's Terms and Conditions:

Economics – IF they had higher income while not spraying, and **Technology feasibility** - IF they had a proven solution/method/technology of growing without pesticide spraying.

WHERE DO I START?

Between me and myself, I wonder; *there are so many pests, so where do I start to free my orchards from insecticide sprays?*

Then it dawns on me, *most of the pesticide sprays that I'm doing are for the control of fruit flies.*

These sprays are not effective, so I need to repeat them every few days, even during harvest. Even then, I sometimes get a high infestation.

Once I start spraying those sprays, they immediately disturb the biological balance; I see the natural enemies and non-target organisms simply disappear.

As a result, I need to spray for additional pests, which otherwise have effective natural control.

Those sprays are poisonous, and they leave their mark in the fruits as chemical residues.

They contaminate the environment, and even the aquifer, where we get our drinking water.

But, the worse part still was in front of me; the fruit dealer would look for fruit fly infestation in my produce to bargain a lower buying price.

Since spraying was not effective enough, he would always find one and would drop the price for the whole shipment!

Infestation by fruit flies has an immediate impact on my income.

DESTINATION WITHIN SIGHT

It becomes crystal clear; the greatest change I can make for myself and the consumers of my produce is by getting rid of the endless fruit fly sprays that I am applying well before harvest and during the harvest to its end.

The benefits will be profound, including;

Dramatically reduce the chemical burden in my orchards and the surrounding environment.

Improve biological control; hence save on sprays for other pests.

Save labor and costs of spraying.

But above all, I will be able to label and market my eco-friendly healthy fruits for a premium price and increase my income.

TAKING PERSONAL RESPONSIBILITY

I immediately start looking for a spray-free solution for fruit flies.

For five long years, I try different products that promise to do the work. However, none is effective!

This is when I understand that if I want to bring a better future for other farmers, consumers, the environment, and myself, I will have to develop all by myself that fruit fly solution.

I mark myself that to change the situation; I will have to work on it.

I need to come up, by myself, with a non-spraying solution for fruit fly control.

At that point, I was not aware of further life development that was bound to happen to me. Then help and change did come, in a most surprising and painful way.

I GET RUN OVER BY MY OWN TRACTOR

In 1998, I had a spraying accident. It was stupid, looking backward, it was even funny, and my entire fault.

For the following, it helps if you have some experience of driving a tractor, or at least you should know that you could start a tractor's engine without sitting on it.

At that crucial moment in my life, my focus was on the spraying tank.

I wanted to switch on the tractor's engine on, so I could start mixing the spraying chemicals in the attached spraying tank.

To do that, I had to press the clutch, which is on the left side of the tractor. I did it with my right foot while still standing on the asphalt outside the tractor.

When I removed my foot from the clutch pedal, the tractor, which was in first gear, started to drive.

Its rear huge left wheel knocked me over flat on the ground and then rolled over me from foot to head, crushing bones and leaving me lying down on the hard asphalt.

As it rolled over my lungs, a strong shout came out.

I did not feel pain; I just thought, "*how do I stop that tractor.*"

I got up and started chasing the tractor, only to find myself crashing back into the asphalt.

In the hospital, it turned out that the shoulder and pelvis were broken.

The tractor stopped at the wall of the building ahead.

Meanwhile, my colleagues rushed to see what has happened. Being afraid that something happened to my back, they didn't move me but called an ambulance that rushed me to hospital.

POSITIVE CHANGE IS ON THE WAY

On the way to the hospital, strapped to a stretcher, I was thinking to myself, am I ever going to be able to walk again, am I going to be paralyzed?

A few hours later, already in the hospital, still unable to walk, I noticed that my chronic allergies were gone.

There was no sign for the runny nose symptom that has bothered me since an accident I had as a five years old child (another story), just 50 meters away from where the tractor run me over.

That was the first positive sign for the future to come.

I KNOW WHAT I DON'T WANT

During my recovery, while still immobilized and bound to stay at home, I had plenty of time and very little movement capabilities. I had to keep myself busy.

This was when I started really doing the thing I marked for myself years ago, which keeps me busy to this day, developing a concept, a technology, a non-spraying solution for the control of flying pests.

Knowing the available technologies, which I tried them all, including - Sprays, Trapping, Sterile Insect Technique, and Mating Disruptions, I knew that more-of-the-same is not the solution.

What I wanted, what farmers need, is something far better, more effective, more easy-to-use, and more environmentally friendly.

The perfect model group of pests, for that platform development purpose, would be – fruit flies.

If I could do that for fruit flies, I could do it with other flying pests as well.

PROBABLY THE FIRST EVER HOME-MADE PEST CONTROL SOLUTION

Like any start-up, I worked in a garage, which practically was my kitchen.

With my new-born baby around, I started experimenting and composing 'attractive' formulas that are safe for humans.

I said to myself, *"I want to use only ingredients, which are safe to use in my home kitchen, next to my wife and our baby. This will ensure that the solution I am developing is safe and is helping in producing healthy fruits."*

This is how *FreeDome* was perceived.

FIRST FIELD RESULTS

I recovered fast, and a few months later, I deployed prototypes in my orchards.

The results were amazing, and for the first time, I managed to produce healthy fresh fruits free of fruit fly infestation, free of sprays.

I couldn't believe it, as I become aware that my dream of growing fruits without sprays is feasible.

I can't believe it, I did it with my self-made solution, starting with the most formidable pest I was facing.

"Out of the eater, something to eat; out of the strong, something sweet." Samson's riddle, Judges 14:14.

A tractor nearly killed me, but now I am free of physical allergies (body), free of fruit fly sprays (labor), and managed to free the fruits and the environment from the pesticide hurdle (soul)!

Then, I realized, I am probably on to something big. Maybe even huge.

To grasp the next stage, I was taking; we first need to understand reality as it is today.

We need to have a deeper and in-depth view of fruit production, marketing, and international trade, including the central part that pest control / pesticides / spraying has to do with it.

PART II – CURRENT GLOBAL STATUS

THE DISASTER OF DEPENDENCY ON SPRAYS

"If all you have is a hammer, everything looks like a nail" (Abraham Maslow). In our case, pesticide sprays are the hammer [>><<].

I still remember that ALL my attempts to grow better quality and more quantity of fruits were all linked and dependent on using *Chemical Spray*.

Much of the following I learned by myself, the hard way – the ten (10) truth about **pesticide sprays**:

1. **LEADING** - It is the leading crop protection method for the past 100 years, to the level that for many people, *Crop Protection = Sprays*. This uniform mindset was challenged by Rachel Carson, the author of the *Silent Spring*, which raised public awareness of the severe damage caused by the use of sprays, including the realization that often *Sprays = Food Poisoning*. Sadly, the original mindset still prevails.
2. **APPLICATION** - Their application requires equipment (sprayers, tractors) and water (to dilute the chemicals). For these reasons, many of the world's farmers will not use sprays since they lack access to equipment, and water scares. That makes the solutions in-accessible.
3. **NON-SPECIFIC** – Their mode-of-action is by releasing/dispersing poison to the environment, which is killing the pest upon contact or digestion. Pesticide sprays may aim a specific pest, but in reality, are non-specific. Therefore, they vastly affect non-target and beneficial organisms, as well.
4. **UNREALISTIC TIME & BUDGET** - It takes about 20 years and \$ 300M to develop a new pesticide. For economic justifications, the Agro-chemical industry targets mainly major crops and main pests, leaving many other crops un-protected. Even then, they are still late to respond or never challenge major global problems, which partially explains why worldwide invasive insects cause damage in the scale of €69 billion per annum [>><<].
5. **PARTIAL ANSWER** - Many mega-pests have no effective control by sprays, e.g., mosquitoes, fruit flies, fall armyworm, locust, etc. [>><<]. There are chemical products registered for spraying against these pests, and they are applied, but the results are not satisfactory. See my own story of intensively spraying for fruit flies and other pests. Yet, the fruit dealer was still able to find an infestation.

6. **UNEFFECTIVE** - Global pesticide efficacy of control is estimated at 39% only! Fifty percent (50%) yield loss is common for many crops, especially in the tropics, where climate conditions are counter-productive to spraying, and many pests have ineffective spraying solutions [[>><<](#)].
7. **POISONING** - 41 million farm-workers are estimated by PAN International to suffer pesticide poisoning each year. It is estimated that the deliberate ingestion of pesticides causes 570,000 deaths each year, out of those 200,000 are from unintentional poisoning [[>><<](#)]. To understand the proportion; COVID-19, a one-time event, death toll, in 2020 as of 10 July data is 550,000 dead.
8. **EXPORT BAN** - Chemical residues in produce, and infestation by quarantine pests, in spite of spraying, are the most common reasons for fresh produce export ban. Most of Africa and Asia are under such a ban!
9. **HARMFUL TO HEALTH** - Resulting from pesticide residues in fresh produce, all people have pesticide residues in their body [[>><<](#)]. Some of these levels impose a high health hazard.
10. **PUBLIC DEMAND** - Consumers resent the use of pesticide sprays - demand fresh-produce that is grown in a healthy environment, and completely free of chemicals and pests. When buying Conventional or Organic produce, most consumers do not get what they want; chemical-free fresh produce. Unknowingly, they consume sprayed produce with chemical residues.

The above is a result of **the inherent limitations** of the pesticide spray technique.

One may conclude that these shortcomings alone make pesticide sprays incompatible to the 21st century public demands. For more [[>><<](#)].

THE IMPACT OF INEFFECTIVE POISONOUS SPRAYS

The above inherent limitations of pesticide sprays have impacts that exceed the boundary of pest control and affect us all. Partially, because pests are most abundant in the tropics, and this is where pesticide sprays are the least effective [[>><<](#)].

SUSTAINABLE DEVELOPMENT GOALS (SDG)

Most of the UN defined SDGs are negatively affected by pesticide sprays and their ineffectiveness [[>><<](#)].

Take, for example, the first three SDGs - poverty, hunger, good health, and well-being. In these very moments, tens of millions in east Africa are under danger of hunger due to locust.

They were poor, but now they will become poorer. When sprays are made, the chemicals are consumed by the livestock, and later transferred to the people.

That is not all.

MANGO AS A CASE STUDY FOR THE IMPACT OF INEFFECTIVE POISONOUS SPRAYS

Take, for example, the mango industry.

Why Mango?

Because it is the most common fruit crop in many African and Asian countries.

It is a high-value cash crop, and when cultivated properly, can generate high income to farmers.

Mango fruits are highly susceptible to fruit fly infestation, especially in the tropics, where the fruit fly species lack proper pesticide spraying control.

IMPACT ON FARMERS, WITH AN EMPHASIS IN DEVELOPING COUNTRIES

- **High infestation** - Although spraying, they suffer yield loss of 50% due to fruit flies alone! This affects their diet and livelihood.
- **High cost** - The many sprays they performed cost them a lot of money and still have a negative effect on their yield, income, wealth, and health.
- **Export ban** - Because of chemical residues and infestation by quarantine pests, i.e., fruit flies, they cannot export Mango. Hence, they get a lower price for a lower value.
- **Ineffective Value Chain** - Because they cannot export for many years, the Value Chain of post-harvest processing and selling to high-value markets is broken or missing.
- **Negative chain of reaction** - With no prospect for exporting, no one is willing to invest in this sector – no investment → no crops → no income → orchards are not intensified → yield remains low per hectare → farmers remain in poverty → often in hunger.

- **A growing gap** - Without investments, the technological and economic gap keeps expanding.
- **A growing inequality** - Those countries have to IMPORT food, which negatively affects their agri-industry and Agri-trade. This only deepens inequality in the world.

IMPACT ON CONSUMERS

- **Health** - Consuming produce containing chemical residues, often extremely high and well above the Maximum Residues Level (MRL) allowed.
- **Quality** - To avoid high infestation, farmers harvest the mangoes very early in the season, often when they are very green and before ready, on account of taste, flavor, size, looks.
- **Volume (quantity)** - availability of produce is limited in volume and period. Hence, the price keeps high. Most of the supply to premium markets are from very few regions, in very few countries, in which fruit fly is not a major problem. At the same time, most of the vast Mango production areas in Asia and Africa are under *Export Ban*.

IMPACT ON ENVIRONMENT

Sprays adversely affect the environment; aerosol poison in the air, in the water we drink, the soil, the variety of species like beneficial insects and bees, biological balance, etc.

PART III – CHANGE IS HERE

CHANGING MYSELF FIRST, BEFORE CHANGING THE WORLD

As I shared my accident story as a young fruit grower, I understood that if I want to increase my income, I need to change → differentiate my produce → increase the quality of my produce → brand it → and... sell for a better price.

The first step toward differentiation of my produce was to develop an alternative crop protection technology that will enable an effective fruit fly control.

That's it. I had a two stages plan:

- (A) Stop (or dramatically reduce) pesticide spraying.
- (B) Brand it as premium produce, and sell it for a higher price.

At this point, I started thinking not only of my own orchards but more globally.

I set my vision and goals – *"To improve farmers' livelihood by increasing quality production, free of bio and chemical hazards, grown in a safe, eco-friendly environment, to enable the consumers to enjoy better and healthier food and life."*

Today, 26 years after I first started my quest for change in 1994, the questions that many are still asking eco in my mind *"is it feasible to have agriculture, and moreover, export, without the use of pesticide spraying?"*

"IS IT FEASIBLE... ?"

One way of getting an answer to that question is by looking for an extreme situation and conducting a case study of it.

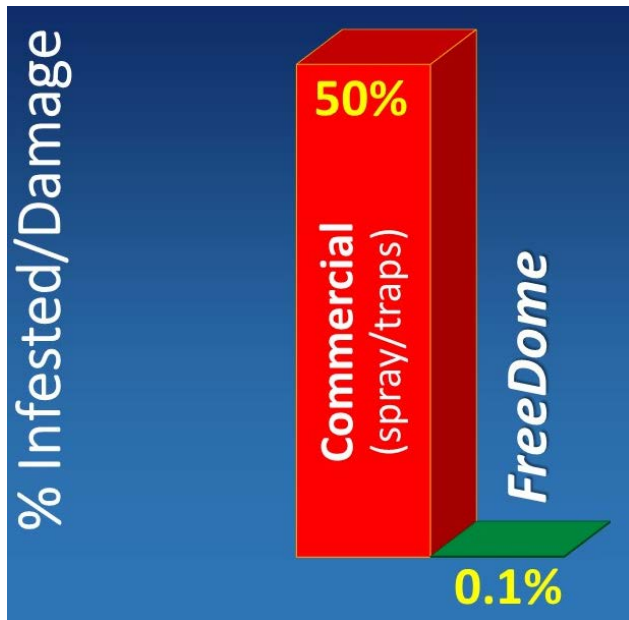
For the case study example, let's take and look at the **most common** fruit tree on a continent, which is also the **most sensitive** and affected by the **most aggressive** pest. Furthermore, we look for a case where that pest is the **most damaging**, including when pesticide sprays are used.

Surprisingly such a case study scenario do exist -

Mango is the most common fruit tree in Africa and Asia. It is also highly sensitive and affected by several aggressive fruit fly species. Currently, mango infestation rate in Africa and Asia due to fruit flies is about **50%**, even when sprays are used!

Results of repeated field tests using Biofeed's non-spraying solution, the *FreeDome*, in Africa and India, showed a **95% to 99% reduction in the rate of infestation by fruit flies**, versus commercial control, mostly sprays.

In all sites, we confronted a **complex of fruit fly species**, and in times had to deal with extreme dry hot, as well as very wet climate conditions.



Rate of mango infestation by fruit flies (2019, Africa, and Israel). Similar results were received in India in 2017-2018.

DOES GOOD CROP PROTECTION RESULTS ENSURE EXPORT AND INCREASES INCOME?

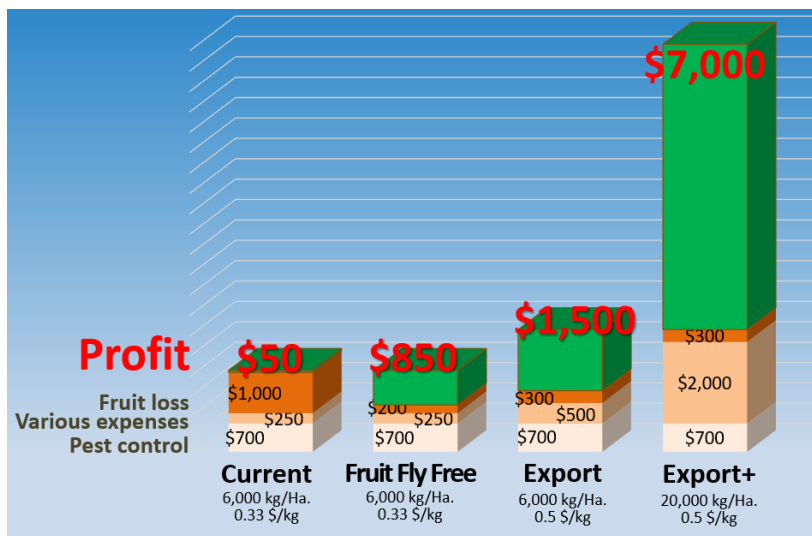
One may say, *"Now, we need nothing else. It is sufficient to have an effective solution for fruit flies and significantly lower the infestation."*

Is it really so?

In my vision, I see farmers that are earning much more. Is it really the case for farmers that only apply the fruit fly control solution, the *FreeDome*?

Looking at the figure below, we see that effective control of fruit flies does increase the profit of the farmer (from \$ 50 to \$ 850 per hectare).

But even then, it is less than 10% from advanced exporters that can make a profit of thousands of \$ per hectare. Still, top growers can profit \$ 40,000 per hectare (not presented in the figure).



The economy of Mango. One can increase his income by focusing on increasing the quality of the produce, and the volume of yield/Ha. Note that *Top Growers* can earn even \$ 60K per hectare. For more info [\[>><<\]](#).

Why farmers that control fruit flies effectively, using a non-spraying solution (*FreeDome*), do not instantly start exporting and maximize their profit?

The truth to be said is that most farmers can't export for various reasons. Here is a shortlist:

- The country is under an export ban.
- The value chain for export is broken and/or ineffective.
- The quality is not sufficient.
- The quantity is too little.
- One or more part of the value chain is not standing up to one or more required protocols.
- Missing relations, access, and knowledge required to act in high-value markets.
- Have the know-how of growing, but not for effective business, marketing, and branding.

Now you understand why most of the farmers will only make fraction of their potential income, even when fruit flies are well controlled, which is the basic necessary element for export.

Hence, farmers will continue to struggle, and the countries will not be able to capitalize on the agricultural professional success.

UNDERSTAND THE FARMERS

To help farmers increase their income, you need to understand them. Most farmers do not have the capabilities to leverage their professional success of growing great produce to an agri-business success.

As a former farmer, I understand that being a farmer is an exceptionally challenging task, being the best from planting the tree, to growing it, taking care of the fruits, and market it.

If we do not expect one person to manage a factory's operation all by himself, why do we expect farmers to do it?

The way to help farmers, especially ones in the emerging countries, is through taking off some of the load their back.

Farmers are professional in cultivating and growing. ALL other elements and tasks like packaging, marketing, branding, etc. are way out of their comfort zone. In addition, farmers do not have the know-how of how to increase their yield by 2, 4, 6, and even ten times.

Helping farmers means to understand their strength and weaknesses, and help them where they need you the most.

MAKING THE WHOLE MILE - THE FULL CIRCLE

Taking the farmer's point of view, I understand where he needs the greatest support to increase his income and profit and to covert his operation into agri-business.

In view of Biofeed's core values - from that deep understanding of providing healthy produce to consumers, respecting the environment, and honoring farmers by helping them increase their income, we offer the following well-defined tools, methods, models and protocols –

Fruit Fly Certified Trade Zone (FFCTZ) – a protocol that enables us to get from defined and designated areas the produce free of fruit flies at export quality to export markets, under a special agreement with the importing country.

FreeDome is the main tool used in the FFCTZ to combat fruit flies.

Green Valley National Export Project (GVNEP) – a protocol that, in addition to FFCTZ, includes an extended set of services to help farmers increase their yield per hectare and to enable the country to rebuild the value chain required for extending export.

Green Valley Fruit – a brand name and a label that ensures compliance with the above protocols, which represent Biofeed's Values. [\[>><<\]](#)

This is how we can turn the developing countries into the main food producers of the world. If you believe it, it is possible [\[>><<\]](#).

I am confident that African and Asian countries that are now relying on agriculture can significantly improve their situation and achieve sustained economic growth, even if their starting point is challenging with considerable uncertainty.

If you wish to kick-start your economy or national scale operation using advanced economic models and agricultural technologies, contact me.

Let's see how together we can take it forward. E-mail me to nisraely@biofeed.co.il or text +972-5423425 (WhatsApp).

Forward this article to someone who should see it. Use this link - [press here](#).

*For a greener world
Free of sprays
Full of joy*

See you soon,
Nimrod

A handwritten signature in blue ink, appearing to read 'Nimrod', written over the bottom right corner of the portrait photo.

P.S.

In this link, you can learn more about Biofeed and what we stand for [[>><<](#)].

P.P.S.

Biofeed exists for many years; our experience brought us to understand that *a full solution* must include a state-of-the-art crop protection technology combined with a suitable protocol. Therefore, we tailor-made a solution to a situation where there will always be the usage of the Technology plus Protocol, i.e., the know-how supported by qualified and experienced management.

The Key Stages (elements) are:

- 1 - *FreeDome* to ensure effective fruit fly control.
- 2 - *Fruit Fly Certified Trade Zone* to enable regulators, exporters, importers, and farmers to gain mutual trust, confidence, and peace of mind in their present and future.
- 3 – *Green Valley National Export Project* – made to enable participants in the Value Chain to extract higher financial benefit from the value they have created.
- 4 – Field tested and proven results – experienced professional team.

P.P.P.S.

On-line additional information –

- * Join me on [LinkedIn](#) for many more posts and updates [[>><<](#)].
- * Previous articles [[>><<](#)].
- * The unfinished historical series *The Agricultural Gap*; discussing the 12,000 years history of agriculture, starting with *The Agricultural Revolution*, moving to nowadays and the Agri-industry Revolution [[>><<](#)].

***Change Begins With A Decision
That The Existing Reality Is A Choice
And Not A Decree Of Fate***