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COMPARISON OF THREE SYSTEM APPROACH METHODS FOR FRUIT FLY CONTROL IN AFRICA AND ASIA

"A PLAN THAT IS NOT FEASIBLE IS NOT A PLAN"

Consumers' demand produce and, more specifically, quality fresh fruits, free of chemical residues grown with zero environmental impact.

National bio-security authorities' are becoming less tolerant and forgiving to any breaching of the protocols, and demands from exporters and growers are more stringent year by year.

Fruit flies are the most problematic fruit pests, causing under current control measures a global annual economic damage in the range of tens of USD billions.

There are thousands of fruit flies species, from which only 83 are of economic importance [\[>><<\]](#).

Fruit flies of economic importance result in an export ban on fresh fruits export from most African and Asian countries to the lucrative – high value, high price, global markets of the EU, USA, Japan, etc.

It is agreed that the most effective way, and hence the required solution for tackling fruit flies, is through a System Approach.

A couple of weeks ago, I asked an African mango exporter, "*what is your dream?*"

Without hesitation, he replied, "*I wish that all farmers, including smallholders, will have an effective solution for fruit flies control.*"

I asked, "*why?*"

The fruit exporter answered, "*if not all mango growers will have an effective fruit fly control solution than soon, we all be under an export ban.*"

Without expressing the words themselves, he described what experts, phytosanitary bio-sec authorities, and regulators, call - System Approach.

SYSTEM APPROACH

There are many ways to apply a System Approach solution for fruit fly control. The most common one is the *Area-Wide Fruit Fly Control (AWFFC)* option, using sterile males SIT (Sterile Insect Technique) alongside bait sprays, traps, and sanitation.

This option is typically used by countries where *Ceratitis capitata*, the Mediterranean fruit fly (Medfly), is the main or only fruit fly pest.

There are many advantages of using the SIT approach, which made it accepted by numerous countries.

One may wonder, "*why is it that after nearly 70 years of practicing the SIT approach, it is not the most common way of fruit fly control?*"

An easy answer will be, "*it's not effective enough.*" Although it is true, you should look deeper into additional reasons.

I believe that learning case studies, such as the AWFFC System Approach, can help us understand why it is not effective in some places and why there is a need for a different conceptual approach to save African and Asian farmers and countries.

I view it as an opportunity to learn what should be done to improve fruit fly control in the most troubled places in the world, places "blessed" by several economic importance fruit flies, and where **Medfly is not** the primary fruit fly pest.

HOST	NFFSP
CITRUS	29
MANGO	29
GUAVA	24
PEACH	20
CUCURBITS	17
TROPICAL FRUITS	16
SQUASH	14
TOMATO	13
APPLE	12
AVOCADO	12
CUCUMBER	12
PAPAYA	11

The number of possible fruit fly species (NFFSP) on the same host [\[>>><\]](#).

MEDFLY CONTROL ECONOMICS OF SIT

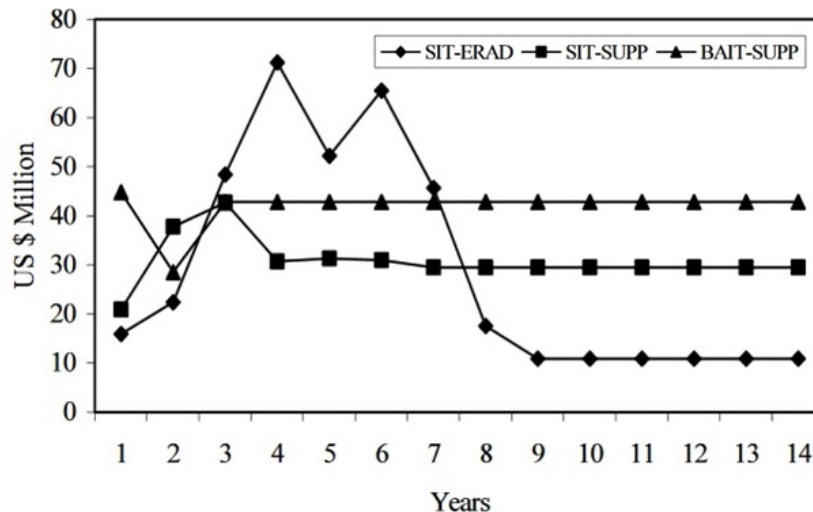
In the mid-'90s of the 20th century, Medfly was the main fruit fly in the Middle East (Israel and neighboring countries, Lebanon, Jordan, Syria, and the Palestinian Authority).

In 1997 Enkerlin W. and J. Mumford published a study where they compared three different system approach options (SIT-ERAD aiming for eradication, SIT-SUPP aiming for suppression, BAIT-SUPP aiming for suppression) for the control of Medfly in an area of 41,038 km² [\[>>><\]](#).

The main findings can be summarized as follow –

- All three System Approach options were found to be more economical than the current approach based on sprays.
- The direct and indirect cost and damage that occur under the current spray based approach are over ten times the price of the control itself.
- Economic results become viable (annual 17% market gain) by year 7 to 14 under the favorite SIT-SUPP option.
- The expected average annual cost for the area under control (41,038 km²) is USD 32M, not including the construction of a fruit fly production plan.
- Fruit fly spraying will continue at a lower level.

- The main upside is reduced fruit damage, but mainly the opening of new market opportunities for fresh produce exports.
- The following are the annual costs for Mediterranean fruit fly control in the region.



SIT SYSTEM APPROACH; THE UPSIDE & DOWNSIDE

On the upside, it is evident from the above that the fruit fly System Approach can reduce the use of pesticides, reduce fruit fly damage, and above all, open additional export markets opportunity and the economic increase that it results.

On the downside, we can list:

- High costs of such projects, that is acceptable only when agriculture is highly profitable. This is not the case in most African and Asian countries.
- The need to apply the program in a vast area, e.g., hundreds/thousands of square km.
- The long time until the return on investment – requires “deep pockets” and a “long breath.”
- The remaining dependency on fruit fly sprays. Hence, chemical residues remain a problem.
- Such an approach is cost-prohibited to farmers, even when associated and organized. The government needs to fund and continually support or even operate the SIT control program.
- High set up fees – on-site SIT factory needs to be established before project operation. Set up costs may exceed 10M US.

- Unsatisfactory control results.

But that is not all; there are facts that make the area-wide SIT approach **irrelevant** to countries where Medfly is not the primary fruit fly pest –

- It takes tens/hundreds of USD millions and tens of years to develop a new strain for any additional fruit fly species.
- The expected cost of simultaneous control of 2 or 3 fruit fly species will be far higher than for Medfly alone. Note in the table above that main crops, such as citrus and mangoes, are hosts to many fruit fly species. Indeed, in Africa and Asia, the population is a mixed combination of at least 2-3 dominant fruit fly species.
- What happened if a 'NEW' fruit fly species invade the region, as happened in reality only three years after Enkerlin W., and J. Mumford published their study? What then?
- Risk – the need for investment set up is enormous. It holds a very high risk in the case that cooperation within such a vast area is not possible (also note the political instability in the region). From professional reasons, the infestation/cost/benefit results are not as expected.
- SIT is supplementary to spraying. Without an effective spraying chemical and application, the project cannot succeed. It happened that the most effective sprays are the ones applied for the Medfly, while most fruit flies lack effective chemical control, i.e., sprays.

The downsides listed above represent some of the reasons why the System Approach based on SIT is **NOT used in most countries**.

Unfortunately, currently, the use of sprays/traps/bags/sanitation, and any combination is not bringing the required results.

Hence, the average fruit infestation of fruit fly hosts, such as Mango, is **50%!!**

HOT WATER SIT SYSTEM APPROACH

Before continuing, it is worth mentioning another System Approach that is gaining hold in recent years: post-harvest treatment by cold or by immersing in a hot water bath like it is in mangoes.

Using one of these options enables entrance to export markets.

However, one should keep in mind that post-harvest treatment, by definition (and results), doesn't replace the need for effective fruit fly control. Besides, such treatment is lowering the quality, and hence the market price of the fruit.



Hot water bath.

Farmers using a post-harvest treatment **will continue losing** much of the fruits because of fruit flies, **will continue** having chemical residues (if spraying), and **will continue** early harvest of pre-mature fruits to 'escape' increased infestation.

As if this is not bad enough, because fruits are still harvested pre-mature, and are cooked in hot water, they will fetch lower prices. Meaning, their potential income will decrease.

Post-harvest approach imposes additional costs on the farmers and the state, and decrease income potential.

We can conclude that post-harvest methods can help secure high phytosanitary standards, but cannot replace the need for a practical and effective *System Approach* for fruit fly control.

The minimum we expect from a *System Approach* is to enable year-round Export Quality fruit fly control, and harvest of fruits based on physiological maturity and market demands rather than based on fruit fly threat.

THE NEW WISH LIST

Based on the above upside and downsides when using the SIT system approach, we can design our dream *Desired System Approach* –

- No set up investments.
- Cost-effective for farmers.
- Not dependent on supplementary spraying.
- Applicable also to smaller regions, e.g., hundreds of hectares instead of hundreds/thousands of square kilometers.
- Immediate results and economic feasibility.
- Option for simultaneous solution for several fruit flies
- An immediate solution in the case of an invasion of a 'new' fruit fly species.

THE SOLUTION FOR AFRICA AND ASIA

As a former farmer, and as one continuously working with fruit exporters, I know the challenges that farmers and government are facing to export.

These challenges include the need for high produce quality, zero quarantine pests' infestation, zero chemical residue, the risk of the export ban, and assuring high income to cover the extra expenses.

It is a fact that the current approach is not up to the requirements, which explains why so many farmers and countries are under the export ban, unable to export as they wish.

You can fix something only when you understand what is 'broken' with the current approach and clarify your objectives.

The *Fruit Fly Certified Trade Zone* (FFCTZ) [[>><<](#)] is designed to provide a user-friendly, easy to use tool for governments, exporters, and farmers as one.

It fulfills the requirements listed above, and more -

- No need for setup investment.
- Cost-effective to current control.
- Year-round program and control.
- Applicable for areas as small as 50 hectares and above.
- Export quality results, typically in the **first** year.
- Option for simultaneous solution for several fruit flies.

- A prompt solution is available in the case of an additional invading fruit fly (typically up to 12 months).
- Professionalism - field-tested, and field-proven.
- Turnkey solution - fully operated by a team of experts.

THE LOCAL OPERATION & TEAM

The FFCTZ is tailor-made for each country, and then per each program (area treated). A dedicated professional local team of experts executes the program together and under the supervision of Biofeed. The tasks include:

- **Pre-analysis** of the project - determining the degree of suitability for the program.
- **Management** of the program.
- **Deployment** of the FreeDome [\[>><<\]](#) fruit fly non-spraying solution.
- **Pest population** monitoring.
- **Fruit infestation** monitoring.
- **Data** collection and analysis.
- **Quality** assurance.
- **Issuance** of a certification of quality.
- **Cooperation** with the local plant protection authorities.

URGENCY, SCALABILITY and OPPORTUNITIES

We keep in mind that the *Fruit Fly Certified Trade Zone* (FFCTZ) is meant for farmers in countries under *Export Ban* or risking such a ban if not improving their phytosanitary standards.

Such countries, and their farmers, have no time to waste, and must get results now, almost instantly.

Hence, standing up to the most demanding phytosanitary standards is their highest priority.

The FFCTZ approach enables us to start 'small' and expand to more regions and increase the area under the program when confidence and experience increases.

The FFCTZ is not replacing any protocol or program but is a complimentary result proven program that a government can provide to its farmers and exporters, to increase fruit production and export.

Although approved by the government, the FFCTZ is economically accessible to farmers who wish to start exporting or renew export (if currently under an export ban).

Meaning, FFCTZ is feasible with or without direct government support.

Above all, it opens a NEW OPPORTUNITY for farmers to start exporting, under a high standard protocol, even from countries under Export Ban or risking such a ban.

Note, Biofeed is focused on supporting high-value fruit producers, e.g., mango and avocado growers, to start exporting. Hence, we give the highest priority for such programs in Africa and Asia.

Contact me if you wish to kick-start your economy or national scale operation using advanced economic models, protocols, and field-tested agricultural technologies. Let's see how together we can take a GIANT step forward and bring high-value business and market results.

Please E-mail me to nisraely@biofeed.co.il or text +972-5423425 (WhatsApp).

For web translation and sharing with friends - [press here](#).

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

See you soon,
Nimrod



P.S.

I will be in Senegal from August 22nd to the 30th. You are welcome to contact and find out if we can meet.

P.P.S.

Biofeed believes in making dreams come true, and we love to collaborate with people and companies with whom we share common *Values*–

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 [[>><<](#)].

P.P.P.S.

You can learn my *WHY*, *HOW*, and *WHAT* that got me involved in a lifetime mission of #MakingADifference, and how that lead to establishing Biofeed [[>><<](#)].

P.P.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 suitable protocols. Therefore, we tailor-made a solution to a situation where there will always be the usage of the *Technology plus Protocol plus Qualified Support*.

The Biofeed *Green Valley* INITIATIVE is based on critical Solutions, Methodologies, Protocols, and Models, which are ALL field-tested and results proven. The key elements are:

- 1) *FreeDome*– the core technology for fruit fly control, which enables export quality. Used in conjunction with FFCTZ.
- 2) *Fruit Fly Certified Trade Zone (FFCTZ)* – a protocol to enable regulators, exporters, importers, and farmers to export produce from designated regions.
- 3) *Green Valley National Export Project*– this protocol is based on an Israeli model. It is designed for governments interested in adapting their country's agriculture to the 21st century.
- 4) *Green Valley Fruits* – quality assurance protocol with a designated fruit certification label.

P.P.P.P.P.S.

Who is qualified for working with Biofeed? A local partner who can take part and advance the FFCTZ initiative, with a particular focus on mangoes, e.g., fruit growers' organizations, fruit traders, exporters/importers, governments, businesspersons, food chains, etc. [[>><<](#)]

IMPORTANT! Our investment in each project is enormous. Hence, it requires us to select those projects with the highest chances of success.

P.P.P.P.P.S.

Additional (on-line) information –

* Join me on [LinkedIn](#) for many more posts and updates. Please press the FOLLOW button (not CONNECT) [[>><<](#)].

* 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 [[>><<](#)].

And lastly – if you have not yet read my personal story and **then early fatal accident which changed my life**, then here is the opportunity to do so [[>><<](#)].

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