TRY IT OUT for yourself!

This booklet is about - Your health, the health of your family and the Protection of Food and Water sources for you and your family - for now and the future.

As a Doctor I feel it is very important for you to know that:

Our Food today is causing a lot of illnesses like Cancer, Heart Attacks and Stroke, and lots of other diseases because of the many unseen, manmade chemicals present in the food we are eating.

Many of these unseen chemicals come from the sprays used in farms, storage rooms and containers to kill unwanted insects (pesticides) and unwanted or overgrown grass and bushes (weedsprays). These unseen chemicals may be used by farmers, farm labourers, middle men buyers, market vendors, food manufacturers and food exporters.

These unseen chemicals not only get into our food, it affects the soil, kills other useful insects on plants and seeps into the rivers and streams affecting fish and other water species.

Many farmers who spray these chemicals do not wear protective materials to protect their skin, eyes, noses and any other exposed body parts, allowing these unseen chemicals to enter their body. Some spray these chemicals close to houses and homes and near children, especially children and they all get exposed without knowing.

These unseen chemicals come in very strong and dangerous amounts and mixes that your body's internal systems get confused and react badly enough to start illnesses. If these chemicals are repeatedly eaten, over time, this body's natural repair systems breakdown and Diseases take over.

Prevention is better than Cure so you and I can reduce the use of these chemicals and help each other remain healthy and eat food, safe and chemical free food.

That is why we have made this booklet – to show how you can deal with unwanted pests in your farms, without harming your health or anyone else's.

An added benefit we have included ways to manage grass and bushes so they add to the nutrition and health value of your crops as they naturally do.

We have tried the methods ourselves and it works! And we have used all natural and available (in Fiji) materials that are also cheap and safe to use.

I encourage everyone that has a backyard garden or a farm to try these methods. Feel free to use other materials that you may know that we don't and PLEASE tell us about it and let us know about your valuable knowledge with each other. (Our contacts are supplied with the booklet).

Let’s start Healthy farming, Healthy eating and help each other Stay Healthy and Happy!!

Who we are

The Foundation for Rural Integrated Enterprises & Development (FRIEND) is a community based organisation established in 1998 through efforts of local farmers, community leaders and local government agencies.

FRIEND is community led and owned and is one of the few organisations in Fiji which is not based in Suva but is based in Lautoka.

FRIEND provides easy access to information and technology to local farmers to enable them to grow their own food. To achieve this FRIEND has conducted agricultural workshops throughout the country.

FRIEND has been awarded the prestigious 2007 People’s Choice award in the Global Green Leaders Awards, as the best environmental NGO in the Pacific region.

FRIEND is a member of Pacific Organic Standard Certification Organization (POSCO) and Pacific Organic Standards Certification Committee, a member of the International Federation of Organic Agriculture Movements (IFOAM) and a registered not-for-profit organisation under the Fiji Laws of 1997.

Importance of Soil Health

Agriculture relies on healthy soils. Just like our physical bodies, when plants have good nutrition they are able to fight diseases. Soil in our natural forests are very fertile due to layers of diverse plants, root systems that hold soil from erosion and natural composting from leaves and bugs that die.

Traditionally when our forefathers dug their root crops, they used to bury the parts not used back in the soil to compost and there was planting of diverse crops in one plot.

In Fiji we have many natural components that can provide soil health. Compost can be developed from leaves, fruit peplings, bones and sea food remains, seaweed and other bioderadable (able to rot naturally) matter. Seaweed and fish bones make for very rich calcium based fertiliser. Green manure, various types of cropping legumes help retain soil moisture and provide nitrogen to the plants. Fiji is very fortunate to have a wide range of leguminous plants from edible beans to Glicinida and sajan (moringa). Sajan leaves when soaked in water for two weeks, and spread on newly planted seeds, speeds up the growing of healthy seedlings.

Animal manure like poultry and cattle waste can be used if they are well decomposed. Countless like India collect cattle urine (rich in urea) from dairy sheds, store for two weeks, then use one part of the substance with 4 parts of water to fertillise (fertilize) crops/vegetable [or irrigate] with urea as well as repel pests.

Grass management is an important part of organic agriculture. Where grass is not a nuisance, it should be kept to dry naturally during dry spells. Grass helps cover and protect the soil from direct sunlight, assisting in retaining soil structure and moisture. Taller rasses can extend and spread out the growth cycle by check or unwanted growth of grass. Total removal of grass through spraying and burning leaves the soil prone to drying during dry spells and erosion of the top organic rich layer during heavy rain.

Mulching is a method used by our farmers and is highly promoted in organic agriculture also. To mulch is to spread the already cut or rotting grass, leaves or branches around the root system of crops. This prevents grass from growing, maintains moisture in the soil and when fully rotted will immediately add more nutrient for the plants/crops.

Intercropping of a variety of crops and cereal planting can also be used for grass management. By planting different crops together, side by side, or overlapping the same crop will not allow any unwanted grass to continue growth, thereby reducing its growth altogether.

Here are some simple tips that we use for improving soil health. Many of these may not have pleasant smells but are harmless when inhaled and are surely good for our plants!! It is important to incorporate sprayers that have not been contaminated with chemical sprays. Always use protective gear while preparing or spraying the following.

Organics Simplified

Organic agriculture uses natural ingredients for soil strengthening and pest management improving biodiversity. Biodiversity means a range of plant and animals live together without harming food production. We encourage bee farming for pollination and honey provides a source of income. Free range poultry can provide food security and income but also natural manure and assist with post management like caterpillar infestation.

Farmers are encouraged to grow a wide range of red cabbage, lettuce, beetroot, green beans, carrots and other vegetables to ensure that there is quality food available all year round. Free range animals like pigs and chickens can be kept to provide eggs and bacon for household use. Free range meat and milk provides as source of income. Free range poultry can also be kept to provide eggs and bacon for household use. Free range meat and milk provides as source of income.

The Pacific Organic Standard is developed specifically for Pacific farmers, in recognition of the unique context of the forms, styles, and methods of farming in the Pacific Islands and gives farmers, processors and consumers confidence that they are helping preserve health soil fertility for all the people involved in organic agriculture. Pacific Organic Standard was developed by Pacific Organic & Ethical Trade Community (POCETCom) Standards and Certification Committee and is recognized by the International Federation of Organic Agriculture Movements (IFOAM). POETCOM is housed in the Land Resource Division of the Secretariat of Pacific Community (SPC).
Organic Soil Improvement Practices

To make your own

**Poultry liquid Manure**

- **Materials**
  - Fish manure
  - Cow manure
  - Horse manure
  - Pig manure
  - Garbage
  - Excreta

- **Method of Preparation**
  - Collect all the above materials in a large container.
  - Fill with water and let it ferment for a month.
  - Use the liquid manure directly on plants.

- **How to use**
  - Apply at the rate of 50-75 L/100 sq.m.

**Seaweed Manure**

- **Materials**
  - Seaweed

- **Method of Preparation**
  - Wash the seaweed and chop it into small pieces.
  - Fill the manure container with seaweed and cover it with a lid.
  - Leave it for 3-4 weeks in the sun.

- **How to use**
  - Apply directly to the soil as a foliar spray.

**Fish Meal Manure**

- **Materials**
  - Fish waste

- **Method of Preparation**
  - Collect and wash the fish waste.
  - Chop it into small pieces.
  - Soak the fish waste in seaweed extract overnight.

- **How to use**
  - Apply as a foliar spray.

**Ash Fertilizer**

- **Materials**
  - Wood ash

- **Method of Preparation**
  - Collect wood ash from your fire place.

- **How to use**
  - Apply wood ash as a side dressing.

**Gritridicia bainiegali & Sijan (morning) Manure**

- **Materials**
  - Gritridicia bainiegali leaves
  - Sijan leaves

- **Method of Preparation**
  - Chop the leaves and soak them in water.
  - Cover the mixture with a lid.

- **How to use**
  - Apply as a foliar spray.

**Compost Tea**

- **Materials**
  - Green manure
  - Crop residues

- **Method of Preparation**
  - Mix the green manure and crop residues.
  - Add water to the mixture.
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- **How to use**
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Pest Management

It is organic farm systems a variety of methods are used for pest management. Beneficial bugs are encouraged example lady birds which feed on crop-damaging aphids, mealy bugs and other destructive insects pests. Chemical sprays kills good and bad bugs. Many of the herbal remedies repell not and added to compost. Resident crops like musk, lemons, grass, basil, sajjan etc can be used as a strong barrier crop to ensure spraying or bugs from other farms doesn’t have direct impact on your farm. Multi-cropping so a variety of colours, heights and smells (herbs aromatic plants) may naturally

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**Cinnamon**

**Plant parts used:** Cinnamon stick, Spice Powder

**Mode of action:** Insecticidal, repellent

**Formulation**

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<tr>
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<th>Target pests</th>
</tr>
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<tbody>
<tr>
<td>All-purpose—insects pest</td>
<td>Mix 4 tbsp with half a gallon of water. Shake it vigorously and let it sit for a few hours. Strain the liquid. Fill spray bottle with the liquids.</td>
<td>Spray the stems and foliage of any affected plants or spread the left over residue around the base of the plants.</td>
<td>Nematodes Ants</td>
</tr>
<tr>
<td>Empty water gallon Cinnamon powder</td>
<td></td>
<td></td>
<td>Slugs Beetles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fungal disease Damping off Mould Phytophthora</td>
</tr>
</tbody>
</table>

**Standard procedures for the preparation and application of the plant extracts**

1. Select plant parts that are free from diseases.
2. When storing the plant parts for future usage, make sure that they are properly dried and are stored in an airy container (never use plastic container). Store in dry sunlight and moisture. Make sure that they are free from moulds before using them.
3. Use utensils for the extraction preparation that are not used for your food preparation and for drinking and cooking. Clean properly all the utensils every time after using them.
4. Use protective gear to avoid direct contact with the crude extract during preparation and application.
5. Keep plant extract out of reach of children and JPS tig pets while leaving it overnight.
6. Harvest all the mature and ripe fruits before plant extract application.
7. Always test the plant extract formulation on a few infected plants first before going into large scale spraying. When adding soap as an emulsifier, use a pencil-based one.
8. Wear protective clothing while applying the extract.
9. Wash your hands after handling the plant extract.

**Effect on humans**

- Extracts are possible irritants to sensitive skin or when used in strong concentration. Do not use on damaged skin.
- Chillies irritates nose, eyes, and skin.

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**Neem Leaves**

**Plant parts used:** Neem Leaves

**Scientific Name:** Azadirachtina indicaa

**Mode of action:** Insecticidal, fungicide

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<tr>
<td>20kg neem leaves 10 litres of water 20 full spoons of soap water</td>
<td>Crush and soak neem leaves in 10 litres of water overnight. Squeeze and soak neem leaves again to take out all neem juice. Filter the leaves using fine cloth if using knapsack spray. Add soap water to the neem solution so that it sticks to the surface of the plant leaves.</td>
<td>Apply neem pesticides or plants in the afternoon around 4.30pm</td>
<td>Aphisidae Flea Beetle Scale insects black moth Nematodes.</td>
</tr>
</tbody>
</table>

**Effect on non-target organisms**

- When using chillies spray the pepper extract concentration is very strong, it can burn the leafs and eventually kill the plants.

**External links**

- [Neem](https://www.fourthway.co.uk/)
- [Brooklyn Botanic Garden](http://nematode.unl.edu/)

**References**


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**Coconut Oil and Water**

**Mode of action:** Repels aphids and white flies

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<tr>
<td>Coconut Oil –10ml Water – 10L Diluted soap –20 ml Knapsack sprayer Measuring jar/ syringe</td>
<td>Thoroughly mix 1 cup of coconut oil, 1 litre of water, or 10L of water. Add 20 ml of soap water. Soap water activates the pesticide to stick to plant. Do not use Liquid detergents or acid. Fill well. Fill in a knapsack sprayer. Spray carefully below and above the leaves in the evening to avoid sun burning the leaves. The thin film of oil will slowly kill white flies. Repeat twice in a week till clear. You will see marked difference after the first spray.</td>
<td>Spray the mixture in the afternoon to avoid the leaves of the crops from getting sun burnt. Apply oil mixture to both the lower and the upper side of the leaves for 3 weeks.</td>
<td>Aphisidae White flies</td>
</tr>
</tbody>
</table>

**Kava**

**Plant parts used:** Left over Kava root after use (kosa)

**Scientific name:** Piper methysticum

**Rank:** Species

**Mode of action:** Insecticidal, repellent

**Formulations**

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<tr>
<td>1 kilo kava kosa</td>
<td>Cover the kosa with water in a tank</td>
<td>Fill the mixture in the spray tank. Apply the solution properly to the plant.</td>
<td>Leaf eating pest Powdery mildew</td>
</tr>
<tr>
<td>1 bucket</td>
<td>Strainer Bucket</td>
<td>After 1 month add four parts more water. Strain the liquids to the bucket.</td>
<td></td>
</tr>
</tbody>
</table>

**Layalaya / ginger**

**Plant parts used:** Layalaya/ginger root

**Scientific name:** Zingiber officinale

**Mode of action:** Insecticidal, fungicidal

**Formulation**

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<td>10 kilo gram layalaya/ ginger 100 litre of water 2 litre soap water</td>
<td>Cut 10 kilo grams of layalaya into fine pieces. Soak layalaya into 100 litre of water in the tank, and let it rot for 1 month After 1 month, scoop out 1 litre of the mix from the tank Mix 4 litre water and 2 litre soap water together with the mix of layalaya/ginger. Strain the liquid so it does not block the nozzle of the spray tank.</td>
<td>Apply the solution to the tip and bottom part of the plant leaves every morning for 3 weeks.</td>
<td>Aphisidae Pod sucking bugs Mealy bugs Spider mines</td>
</tr>
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**Glossary**

- **Damping off**
- **Ants**
- **Mould**
- **Fungal disease**
- **Slugs**
- **Beetles.**
- **Scale insects**
- **Mealy bugs**
- **Whiteflies**
- **Aphids**
- **Spiders**
- **Leaf eating pests**
- **Pod sucking bugs**
- **Mealy bugs**
- **Spider mines**
- **Powdery mildews**

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**Additional references**