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A Guide to Growing Vegetables in the

Republic of Marshall Islands

A Guide to Growing Vegetables in the **Republic of Marshall Islands**

Supported by the European Union through the European Union – North Pacific – Readiness for El Niño (RENI) project implemented regionally by the Pacific Community and nationally by the **Government of Marshall Islands.**

This booklet was drafted by Konrad Englberger, SPC Consultant.

Table of Contents

Foreword

The Honorable Dennis Momotaro
Ministry of Natural Resources & Commerce
Majuro, Republic of the Marshall Island, 2019

Climate change is already impacting the people of the Republic of Marshall Islands. Important food crops (i.e taro, coconut, breadfruit and pandanus) are already being disrupted by climate extremes such as prolonged droughts and this is likely to worsen with future changes in the climate.

It is likely that the prices and transportation costs for imported staple foods (i.e. rice, flour, sugar and biscuits) will also significantly increase in the near future. We must therefore, 'return to the land' and increase our local food production which will protect our economy and the livelihoods of our people from any negative shock due to the increase in imported food prices.

'A Guide to Growing Vegetables in the Republic of Marshall Islands' is not an end in itself but rather a means towards increased food security in Marshall Islands. The efforts by the EU North Pacific – Readiness for El Niño (RENI) project are building on existing efforts by the government of RMI, to build awareness and influence behaviours around the linkage between healthy lifestyles and the reduction of non-communicable diseases such as diabetes and high blood pressure.

This booklet is therefore an important tool not only for boosting the production of local food, but also to encourage the people of RMI to eat more local food in order to enable them to live longer and healthier lives. It is also a means for many families to earn extra income from the sales of local produce.

Through synchronisation of the 2013 Food Security Policy with the other national policies and with support from developing partners, it is my dream that Marshall Islands will be able to develop a sustainable industry of Marshallese-branded agricultural exports.

El Niño will continue to bring drought conditions to RMI in the future, but with support from the RENI project, people living in the northern atolls will now be better prepared.

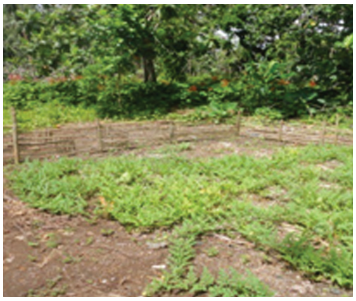
It is my sincere wish that this translated booklet will empower our people to be self-sustaining as we face the myriad challenges to our low-lying nation.

GROWING YOUR OWN FOOD CROP WILL PROVIDE YOUR FAMILY AND COMMUNITY WITH FRESH NUTRITIOUS FOOD.

SITE SELECTION:

Most vegetables require a lot of sunlight; seeds and seedlings should be planted where they will receive full sun. If that is not possible, select a site that receives morning rather than afternoon sun. If only shady sites are available, try growing vegetables that tolerate shade, such as cabbage.

Fencing:
Fencing is usually needed to keep out pigs, dogs and chickens. There are many ways to build a fence, bamboo, local wood and old fish nets can be used to build a fence.



FENCING MADE OF LOCALLY SOURCED MATERIALS

Raised Beds:
Vegetable crops can be grown directly in good soil, pots, bags, baskets and raised beds. Raised beds are beds built 6 to 12 inches above ground level.

Raised beds give you a better garden soil, raising roots above hard, wet, rocky, or bad soil. It improves drainage in the soil, so it is not too wet after heavy rains.

Raised beds are a good way to use compost made from pig, chicken and yard waste. Also raised beds are easier to maintain and help control pests and weeds.

A basket will provide the same benefit as a raised bed but will use less space. You can fill the bottom of the basket with coconut husks to save soil.

RAISED BEDS

RAISED BEDS

Seeds:
It is important to select varieties that can grow under wet, hot and humid tropical conditions.

Open Pollinated Seeds: Varieties that can be grown and seeds saved. You will get plants that are like the parents.

Hybrid Seeds: Varieties have seeds from a controlled breeding. Many say "Hybrid or F1" on the label.

You should NOT save seed from most hybrid vegetables because they will not produce well in the next planting.

Compost:
A general recipe for making compost is:

- 1/3 Green – green leaves, grass, kitchen waste.
- 1/3 Brown – dry leaves, wood chips, chopped coconut husk, and other plant waste.
- 1/3 Manure – pig or chicken. If no manure is available use nitrogen-fixing plants (bean and kerosene tree leaves).
- Sprinkling of soil (feeds compost with decomposers).

1. To start a basket, bin or pile: use a compost bin that lets in lots of air. Place large woody stems on the bottom. Put bamboo with holes in the center of the pile to increase air circulation.
2. Layers: Brown 3-5 inches, Green 3-5 inches, then Manure 3-5 inches, Sprinkle with ½ inch of soil. Continue layers until about 4-5 feet high.
3. Turn or mix pile every 3 to 4 weeks (especially if using pig manure). Frequent turning yields faster decomposition. Compost needs to heat to 140 degrees F to kill diseases
4. Keep compost pile of basket covered during heavy rains.
5. Compost should be ready in about 2 to 3 months and should be dark, crumbly and feel like garden soil.

COMPOST BINS

VEGETABLE GROWING GUIDES:

Beans:
There are many types of beans; there are bush beans, climbing beans and winged beans. Climbing beans are most popular, they can grow for a long period of time. Climbing beans should be grown along a fence or on a trellis.

The land or plant hole should be well prepared, compost should be mixed into the top 4 inches of soil. Beans can be planted directly into the soil. Varieties such as Long and Hawaiian Climbing are recommended.

Spacing from plant to plant should be 10 to 15 inches and from row to row 30 to 40 inches. Depth of seed should be half inch.

Harvest may start after one month of planting and can continue for several months. Fertilizer can be applied at the plant hole or soon after germination.

Weeding and good sanitation (removal of diseased leaves and pests) is very important.

BEANS

Chinese Cabbage:

Seeds should be selected for tropical and sub-tropical climate and not for temperate climate. Varieties, Saladeer, Tropicana, Pak Choy are recommended. Seedlings should be raised in a nursery or seed box prior to transplanting.

Seedlings should be transplanted when they reach the 3 leaf stage. Land should be well prepared, Compost should be mixed into top 4 inches of soil.

Spacing from plant to plant should be 12 to 18 inches and from row to row 18 to 25 inches. Harvest, depending on varieties, it takes 30 to 60 days

Fertilizer can be applied at the plant hole or soon after transplanting.
Weeding and good sanitation (removal of diseased leaves and pests) is very important.

CHINESE CABBAGE

Cucumber:

Cucumber is a warm season vegetable which can be grown in most parts of the world. Some varieties are short others are long, some are cultivated on the ground and others are climbers and should be grown along fences or trellis.

Varieties, Merry Swallow (long fruit climber), Southern Cross Hybrid (short fruit, grown on the ground). Seed can be either planted direct in the ground or may be raised in the nursery and transplanted. Land should be well prepared. Compost should be mixed into top 4 inches of soil.

Spacing from plant to plant should be 1.2 - 2.5 feet and from row to row 2 - 4 feet. Harvest may start after 5-6 weeks of planting and can continue for several months. Fertilizer can be applied at the plant hole or soon after germination. A second fertilizer application may be applied 5-6 weeks later. Weeding and good sanitation (removal of diseased leaves and pests) is very important.

CUCUMBER

Eggplants:

Eggplant belongs to the family Solanaceae. Tomatoes, potatoes and bell pepper also belong to this family. Varieties, Long Purple, Waimanalo long purple are recommended. Seedlings should be raised in a nursery or seed box prior to transplanting. Seedlings should be transplanted when they reach the 3 leaf stage.

Spacing from plant to plant should be 18 to 24 inches and from row to row 24 to 30 inches. Harvest, depending on varieties, it takes 50 to 60 days after transplanting. With good management it can produce over one year. Fertilizer can be applied at the plant hole or soon after transplanting. Weeding and good sanitation (removal of diseased leaves and pests) is very important.

EGGPLANT

Okra:

Okra is an easy crop to grow. There are different varieties which can be used, such as Dwarf long pod or Clemson Spineless.

Seeds can be directly planted into the ground or in pots and transplanted later.
Spacing from plant to plant should be 2 to 3 inches and from row to row 1 to 1.5 feet.
Harvest, depending on varieties, it takes 50 to 60 days after transplanting. With good management it can produce Okra over one year.

Fertilizer can be applied at the plant hole or soon after transplanting.
Weeding and good sanitation (removal of diseased leaves and pests) is very important.

OKRA

Pumpkin and Gourd:

Pumpkin and Gourd are good crops for Atolls as they can be grown on sandy soil along a fence. For seeds, you can either make your own seeds from mature fruits and plants or you can purchase seeds from the market. Seeds can be planted directly into the ground.

Spacing from plant to plant should be 2 to 4 feet and from row to row 8 to 12 feet.
Harvest, depending on varieties, Gourd can be harvested 50 to 60 days and Pumpkin after 75 to 110 days. With good management it can produce over one year. Fertilizer can be applied at the plant hole or soon after transplanting. Weeding and good sanitation (removal of diseased leaves and pests) is very important.

PUMPKIN

Tomato:

Tomato is a popular vegetable which can be eaten raw or cooked. Tomato can be grown in the ground or in pods. In Atolls where the soil is poor pods can be a good alternative,
There are many variety available, so make sure you obtain seeds from a tropical or sub-tropical country like Hawaii (U.H.N. 52 or U.H.N. 69).

Seedlings should be raised in a nursery or seed box prior to transplanting. Seedlings should be transplanted when they reach the 3 leaf stage. After transplanting stakes should be placed next to the plant to allow climbing. Spacing from plant to plant should be 14 to 20 inches and from row to row 24 to 30 inches.

Tomato

CROP ROTATION:

Crop rotation is one of the oldest and most important measures for controlling plant-parasitic nematodes. Crop rotation reduces the severity of soil-born fungi and bacteria. Another good reason for crop rotation is that different crops take different minerals from the soil, and the roots feed in different areas of the soil.

By rotating crops, the land is not depleted and is given a rest. For example, some crops such as legumes and beans add nutrients to the soil. Avoid planting crops of the same family one after another. For example: Never plant eggplants or capsicum after tomato. Those belong to the same family. A good example for crop rotation would be:

First Crop: Bell Pepper or Tomato, followed by beans, followed by cabbage, followed by root crops, followed by legumes (beans).

Sanitation:

Good sanitation will reduce competition with unwanted plants and build-up of pests, therefore good weed control and the removal of diseases (rotten, infested plants, fruits) is very important.

Pest Control:

One way to control pests is the physical removal of pests from the plant or ground.

Home made non-toxic solution can be made from oil and soap (2 tablespoons cooking oil (e.g. Coconut Oil) and 2 tablespoons baby shampoo or dish washing soap). DO NOT SPRAY IN SUN.

Chemical should only be applied under direction and supervision of experienced or licensed personnel. In general, for small home gardens chemicals should be avoided.

Nursery:
Healthy and strong plants produced in a nursery will result in a good crop with high yield. Seeds should be planted in a seed box using potting soil. Daily watering will make the seedlings grow faster

About 10 days after seeding when the plantlets reach 3 leaves, this should be transplanted in cups. Plants should be raised in the cup for another two weeks before transplanting to the field.

Before transplanting, seedlings need hardening which means plants should receive some stress from not getting water for two to three days.

CUPS USED IN NURSERY

COMMON PEST AND DISEASES

Tomato Fruit Worm:

Control by good field sanitation; remove infested fruits and burn; hand pick caterpillar.

Whitefly WF:

White fly has many hosts, such as Pepper, Tomato and Eggplant. Control with sanitation (removal of infested leaves) and/or use liquid oil and soap spray.

Use 2 TBS (Tablespoon) cooking oil and 2 TBS of baby shampoo or dish washing soap.

Aphids:

Control with field sanitation and /or use liquid oil and soap spray.

Use 2 TBS (Tablespoon) cooking oil and 2 TBS of baby shampoo or dish washing soap

Mealy Bugs:

Mealy bugs attack eggplants, beans and many other crops. Good field sanitation, hand-picking and burning of affected plants.

Control with liquid oil and soap spray.

Use 2 TBS (Tablespoon) cooking oil and 2 TBS of baby shampoo or dish washing soap.

Scale Insects:

Some crops like eggplants and tree crops are attacked by scale insects.

Scale insects can be removed by washing or brushing them off.

Spraying with cooking oil four (4) table spoons per gallon, will give some control.

Stink Bug:

Stink bugs attack crops like tomato, okra, beans, corn and others. Field sanitation is very important. Hand picking will reduce the population.

They can be green or dark in color.

Marasmiellus on Banana:

Good field sanitation with good ventilation will provide some control.

Cucumber and Melon Leaf Disease:

Good field sanitation, removal of diseased leaves will help.