

RATU NAVULA COLLEGE
YEAR 11 NOTES AND ACTIVITY 2021 – WEEK 6
AGRICULTURAL SCIENCE

AS 11.3.2.3 FIELD CROPS

Students will research and elaborate on:

- i) One field crop traditionally cultivated in the area
- ii) One field crop recommended for cultivation in the locality
- iii) One field crop not commonly grown in the locality.

LESSON 53: INTRODUCTION TO FIELD CROPS

Lesson Outcome:

Appreciate the different class of field crops

Introduction :

Field crop are any crop, other than vegetables and fruit trees, which are grown for agricultural purposes. There are a number of definitions for the term field crops.

In this sub-strand, the following crops have been classified as field crops:

1 Cereals - a grass grown for its small edible seed

eg. Rice and maize



2 Fruit - fruit that are not produced on trees

eg. pineapple, strawberry, watermelon.



3 Root crops - plants grown for their modified, thickened root or stem which generally develops underground eg. dalo, cassava, yams, sweet potato, potato.



4 Sugar crops - plants which are natural sources of sweet substances called sugar eg. Sugarcane (source of sucrose)

Student Activity:

- i. List four crop types classified under field crop.
- ii. Define field crop

AS11.3.2.3.1: CULTIVATION OF FIELD CROP

Students will research and elaborate on:

- i) One field crop traditionally cultivated in the area

LESSON 54: CULTIVATION OF DALO as traditional crop

LESSON OUTCOME:

Discuss and elaborate the cultivation of Dalo.

Crop: Dalo [Colocasia esculenta]

Varieties

Recommended varieties:

- Samoa Hybrid
- Samoa
- Tausala ni samoa
- Vula ono
- Maleka dina
- Dalo ni Toga
- Kuro Kece
- Wararasa
- Toakula

Site selection

In general fertile, well-drained, deep loamy soils rich in organic matter are preferred for Dalo production. Flat to gently sloping sites with alluvial soils in river valleys are often used

New varieties

Tarova loa and Tarova vula

[Were introduced in 2018 which are both resilient to taro leaf blight.]

Seed selection

Taro is mostly propagated using suckers and tops.

When selecting suckers:

-Select healthy suckers of a similar size to help produce a crop of consistent size and quality.

-Suckers should be 4cm in diameter and trimmed so that 20-30cm of the leaf stalk.



Planting season

July – January

Off season-March – June

Wet zone-Throughout the Year

Intermediate zone-September- March

Soil preparation

Soil on the dalo patch needs to be loosened by digging with fork or by ploughing, and harrowing.

Sites should be prepared to ensure there is adequate drainage and care taken not to overwork soil.

Spacing

Traditional System: Between rows: 1m

Plants within rows: 1m

Mechanize Systems: Between rows: 1m

Plants within rows: 60cm

Planting

Holes are dug to a depth of 25cm deep by hand with a spade or planting stick, or in furrows made by tractors or horses/bullocks.

The tops are planted with the corm section 15-20cm below ground level, and the new dalo corm grows upwards

Fertilizer and manure

a) Poultry Manure: 5 tons/ha Broadcast and mix well with soil 2 weeks before planting.

b) NPK: - 13:13:21

200kg/ha basal application before sowing.

c) Urea: 100kg/

ha. Side dressed in

2 split applications i.e 2 -4 weeks after transplanting.

Weed Control

Weed control

Paraquat at 100ml/15L of water (Sold as Gramazone, Agazone & Royal paraquat)

Hand weeding.

Disease control

Taro Leaf Blight



A major disease of taro not present in Fiji but present in other pacific island countries. Strict quarantine measures must be observed to prevent the spread of the disease to countries.

Insect control

Plant Hoppers, Cutworms, White Fly, Cluster

Caterpillar: Spray Malathion 50% EC, 30ml/15L of water

Taro Beetle:

Apply Confidor at 5ml/15L of water or Sunclopid at 3.75 to 7.5ml/15L of water

Harvesting

Harvesting @ 6-7 months for Hybrid Varieties whilst traditional varieties are ready at 9 months for harvest.

Yield: 20-25 tonnes/ha

Harvesting should occur in the morning or late afternoon when temperatures are cooler.

Post-harvest management

The following are the post harvest management for dalo:

1. **cleaning and sorting**-After harvesting, farmers should clean and check the harvested dalo and discard any corms that are damaged, diseased or infested with pests
2. **packing** –dalo for the local market are tied in bundles with similar sizes and transported to the market.
3. **Storage**-Corms should be stored in a dry, shady location

Products and by products

Then main product of dalo is the corm which is mostly used for food and other products.

1. **Ready-to-eat taro chunks and patties.** .
2. **Taro flour** - .
3. **Taro starch**
4. **Taro peels**-The peels may be used as animal feed, to generate bio-energy, or dried to mulch for the agriculture industry
5. **Taro leaves.**

Student Activity:

1. Explain one disease and pest that affects the taro industry in Fiji.
2. Discuss the cultivation practices of taro from planting to harvesting

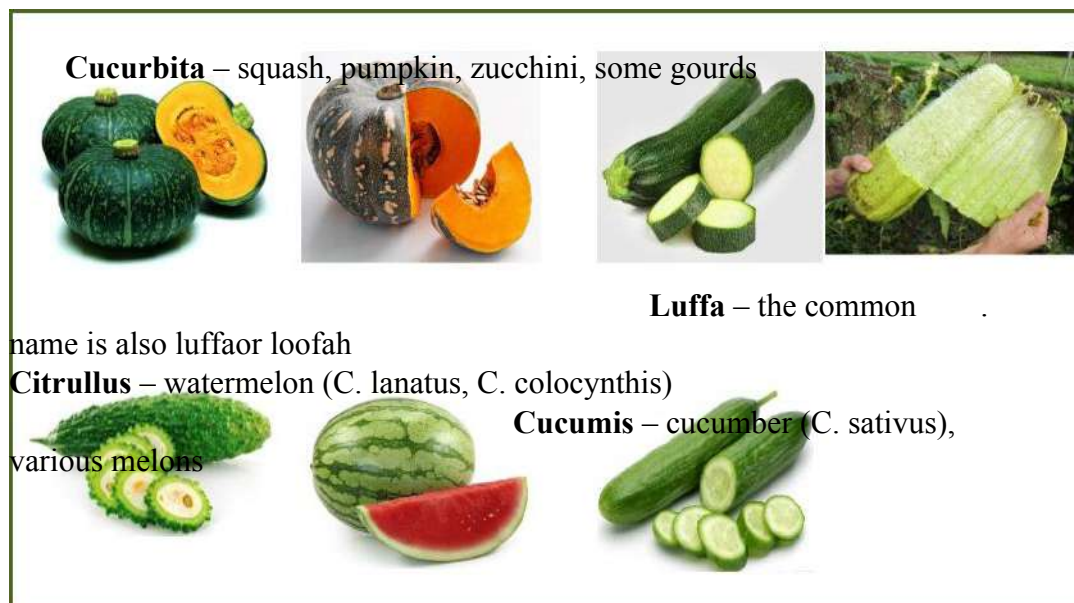
WATERMELON as Recommended Crop.

LESSON 55: Overview of Water melon

LESSON OUTCOME: Discuss the origin of watermelon.

Notes:

- Watermelon, *Citrullus lanatus*, is a vine-like tropical plant which produces edible fruit also called watermelon.
- It belongs to the Cucurbitaceae family which comprises 975 species including:



- Native to Southern Africa, the watermelon has spread throughout the tropical and subtropical world.
- Captain James Cook is believed to have introduced watermelon to the South Pacific and

- over the past 100 years, the watermelon has become one of the leading commercial fruit crops of the tropics.

Student Activity

1. Briefly discuss the origin of watermelon and how it came to Fiji.

LESSON 56: Cultivation of Watermelon

LESSON OUTCOME

Discuss the factors to consider when selecting a site to cultivate watermelon.

Crop : Watermelon [*Citrullus lanatus*]

Varieties

Recommended varieties:

- Queen of Hearts
- Charleston Grey
- Sugar Baby
- Tender Gold



Seed selection

When selecting seeds

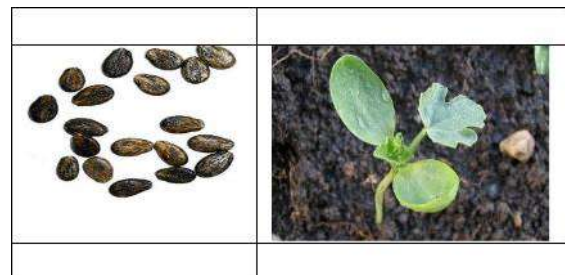
-Select healthy seeds of a similar size to help produce a crop of consistent size and quality.

Soil preparation

Soil on the dalo patch needs to be loosened by digging with fork or by ploughing, and harrowing.

Planting and Spacing

- mounds are spaced 1.5 meters apart.
- ii. a shovel full of compost or poultry manure is mixed into the soil of each mound.
- iii. seeds are sown 4 cm deep
- iv. 3 seeds are sown per mound.



Planting season

The best time to plant is in the cool season **(April to September)** however phase planting is recommended for year round production.

Site selection

In general fertile, well-drained, deep loamy soils rich in organic matter are preferred for watermelon production.

The optimum air temperature is 32°C during the day and 20°C at night for the whole growing period.

Temperatures below or above this range affect the sugar content and hence the fruit quality.

Sites should be prepared to ensure there is adequate drainage and care taken not to overwork soil.

Crop Care

Fertilizer and manure

- a) Poultry Manure: 10 tons/ha Broadcast and mix well with soil 2 weeks before planting.
- b) NPK: - 13:13:21
200kg/ha basal application before sowing.
- c) **Urea**: 100kg/ha Side dressed in 2 split applications i.e 2 -4 weeks after transplanting.

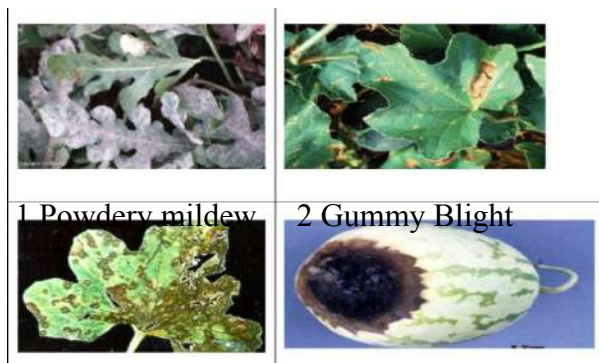
Pruning

Vine and fruit pruning is practiced to obtain greater uniformity of size and shape of fruit. This is done by selecting 2 or 3 best fruit per plant after fruit set and cutting the rest of the fruit off the vine

Weed Control

Paraquat at 100ml/15L of water (Sold as Gramazone, Agazone & Royal paraquat)
Hand weeding. Care must be taken when controlling weeds to avoid damaging the roots and stem

Disease and control



3. Anthracnose 4. Bloom End Rot

Control

- Carefully remove all infected plant parts and burn
- Regulate moisture supply in the soil
- Use disease free planting material

Pest - Insect control

1. Aphids

These tiny soft-bodied insects suck the sap from the stems and leaves of plants.

Biological control

- a) Predators such as lady beetles and their larvae reduce aphid populations.

Harvesting

Signs of maturity:

- it takes from 70 to 120 days from planting to harvest, depending on the watermelon variety.
- the vine's tendrils begin to turn brown and die
- if one side of the watermelon was resting on the ground, it will go from white to yellow.

CUTTING HANDLING STACKING

-A sharp knife is used to sever the fruit stalk 5 to 7cm from the base.

A wheel barrow is used to transport the fruit to a central location.

Fruit is piled in the shade.

Yield: 30-50 tonnes/ha

Harvesting should occur in the morning or late afternoon when temperatures are cooler.

Post-harvest management

- After picking.refrigerator for up to a week, but they will last two to three weeks before cutting.
- Without refrigeration, if kept in a cool, slightly moist place.
- Therefore keep the watermelon shaded to ensure it is cool so that it lasts for longer.

Products and by products

- The **main product** of a watermelon crop is the fruit.
- The **by-products** include:
 - Seeds: eaten either raw or cooked as a snack
 - Ornamental ValueThe watermelon fruit is often used as a bowl for serving fruit.



Student Activity:

1. Explain one disease and pest that affects the watermelon industry in Fiji.
2. Discuss the crop care practices of watermelon from planting to harvesting.