Food and Agriculture Organization of the United Nations

Pacific Community
Communauté du Pacifique

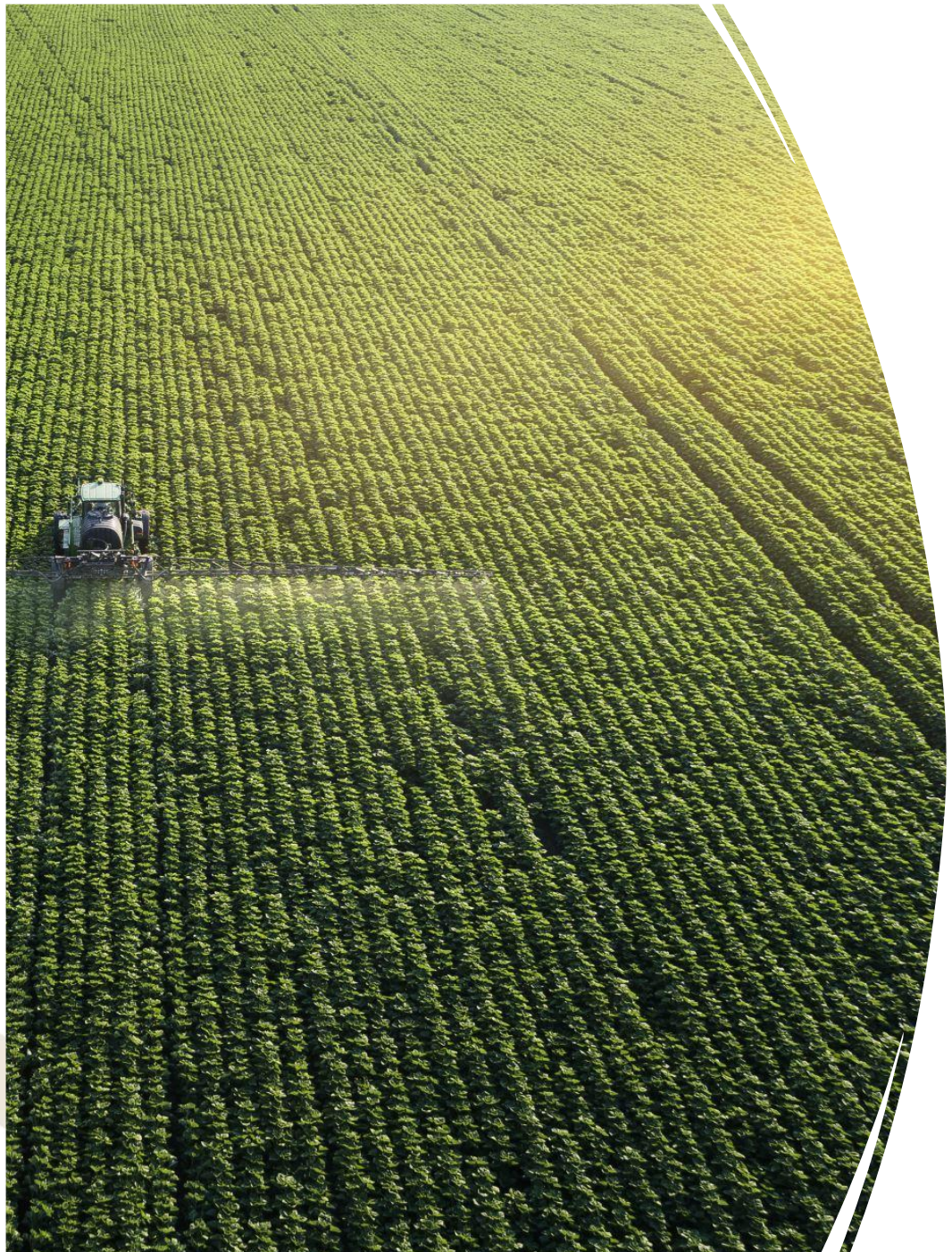
6th Pacific Soil Partnership Meeting

21 and 22 August 2024

Fiji

Rozleen Deo

GLOBAL SOIL PARTNERSHIP



Strategies undertaken by the Ministry of Agriculture towards Soil management

Koronivia Research Station

Ministry of Agriculture and Waterways

Rozleen Deo

2024

6th Pacific Soil Partnership Meeting | 21 and 22 August 2024

Outline

- Constraints- Soil Management and Agriculture
- Ministry Initiatives
- Mobile soil testing services
- Organic Research
- Outreach Program
- Collaborative Research work- ACIAR/CSIRO
- Strengthen laboratory testing capacity
- In Future

ISSUES

- Soil Erosion
- Soil degradation
- Nutrient deficiency
- Salinity
- Climate variability

Ways to address the issue

- Sustainable Farming practices
- Soil Erosion Control
- Reforestation and Afforestation
- Soil Testing and Amendments
- Water management
- Education and Training
- Community Involvement

Research Initiatives

- **Mobile Soil testing**
- Engage Farmers to improve soil quality and profitability.
- To provide soil testing facilities to farmers at their doorsteps (mobile test kit and Soil Doctor initiative
- Issue Soil Health Card

What is a Soil Health Card?

FARMER DETAILS	
Name	Etuate
Residential Address	Winiviviya
Postal Address	
Village/ Settlement	Winiviviya
District/ Province	Lovoni, Lomaiviti
Phone Contact	
Email Contact	
Total Farm Size (Acres)	
Farm Site Location	Winiviviya
Crop Type	Current: Previous:
Fertilizer Application	Type: Quantity:

SOIL SAMPLING DETAILS	
Date of Collection	15th April 2019
MoA Locality Officer	
Phone Contact	
Email Contact	
Soil Sampling Depth (cm)	20cm
No. of Soil Cores	
GPS Location	Longitude: 17°41'59" S Latitude: 178°46'54" E
Soil Job Number	1219045

FERTILIZER RECOMMENDATION		
Sl No	Fertilizer Type	Recommendations
1	Urea	240 kg/ha. Split application
2	Muriate of potash	150kg/ha
3	Ammonium Sulphate	-
4	Triple Superphosphate	100kg/ha
5	Sulphate of Potash	200kg/ha
6	Copper Sulphate	N/A
7	Zinc Sulphate	5kg/ha
8	Borax	5kg/ha
9	Organic Manure	8 to 10t/ha
10	Lime	5t/ha. 4 to 6 weeks before planting
11	Others	-

SOIL TEST RESULTS					
Sl No	Parameter	Unit	Test Value	Ideal Values	Rating
1	pH	N/A	4.8	5.6—6.6	Very Low
2	EC	mS/cm	0.07	0.4—0.8	Low
3	Organic Carbon	%	2.5	4—10	Low
4	Available Nitrogen	%	0.32	0.3—0.6	Good
5	Available Phosphorous	mg/kg	3	20—30	Very Low
6	Extractable Calcium	me/100g	10.33	2.0—10	Good
7	Extractable Magnesium	me/100g	6.14	1.0—3.0	Good
8	Extractable Potassium	me/100g	0.20	0.3—0.6	Low
9	Extractable Zinc	mg/kg	0.4	> 1.2	Low
10	Extractable Sulphur	mg/kg	N/A	15—50	N/A
11	Available Boron	mg/kg	N/A	1—5	N/A
12	Others	N/A			

GLOBAL SOIL PARTNERSHIP

SOIL HEALTH CARD - What vital information is captured?

- **Customized Recommendations:**
- **User-Friendly Format.- simple and easy to understand**
- **Recommendations- farmers can optimize their soil's health, leading to increased crop yields and quality.**
- **Cost-Effectiveness: reduce unnecessary expenditure on fertilizers and other inputs, by providing precise information on soil needs.**
- **Sustainable Practices: Encourages environmentally friendly agricultural practices, thereby contributing to the long-term sustainability of Fiji's agricultural sector**




ORGANIC RESEARCH (on-going)

The Ministry of Agriculture & Waterways (MoAW) capacitates farmers on sustainable farming to restore soil health.

Free bacterium culture is provided to farmers by the MoA.

Research on sustainable farming formulations and field trials is ongoing.

Farmers are being taught compost-making techniques.

Bacterium culture and biofertilizers are used in compost and fields.

Fermented fertilizer is applied to boost plant growth and nutrient uptake.

Collaboration with companies and government bodies promotes the use of bio-solids.

Initiatives cont....

- **Transfer and adoption of SLM (Sustainable Land Management):**

✔ Community awareness raising

✔ Establishment of demonstration sites for good agricultural practices

✔ Practices include intercropping, alley cropping, NFT hedgerow, spot planting, agroforestry, mulching, green manuring

✔ Farmers' hands-on training in soil conservation measures

- **Combating Land Degradation/Drought in Fiji:**

✔ Agroforestry and awareness activities

✔ Establishment of slope land agriculture plots

- **On-Farm Research & Development:**

✔ Soil loss quantification and design of remedial measures

✔ Procurement of flumes, data loggers, and equipment

- **Climate Smart Agriculture Program**

✔ Promotion & Adoption of Agro-ecology & Regeneration for resilient food system

✔ Nitrogen Fixation Trees [NFT] nursery and raising of seedlings for distribution

Collaborative Research

- **Soil Management in the Pacific Island; Investigating Nutrient dynamics and utility of soil information for better soil and farming system management -ACIAR SLAM/2020/139 with CSIRO/SPC**

✔ Research demonstration plots established with the 2 farming communities – Muaniweni/ Nabitu

✔ Soil Survey in Muaniweni – to renew data for the soil portal

✔ Use of rapid analyzers (NIR/MIR) to generate data for the Soil portal

Strengthen laboratory Soil testing capacity

- Expecting completion of major renovation by the end of Nov/Dec this year
- Upgrading and installation of new equipment (ICP & AAS)
- Integrating Rapid analyzers (NIR, MIR) with conventional techniques
- On-going participation in lab proficiency program and working towards lab accreditation
- Improve Data management
- On-ongoing Staff training

In Future

- **Strengthen Soil physical analysis**

✔ Soil Texture
✔ Soil Structure
✔ Porosity
✔ Bulk Density
✔ Water-Holding Capacity
✔ Soil Compaction

- **Bio chemical analysis**

✔ **Enzyme Activity**

- Incubator: maintaining optimal temperatures during enzyme assays.
- Microplate Reader: measure enzyme activity levels in soil samples.
- Substrate Solutions: For specific enzyme assays (e.g., phosphatase, dehydrogenase).

Food and Agriculture Organization of the United Nations

Pacific Community
Communauté du Pacifique

Thank you

6th Pacific Soil Partnership Meeting

21 and 22 August 2024

GLOBAL SOIL PARTNERSHIP