



SPREP
Secretariat of the Pacific Regional
Environment Programme



PacWastePlus
PACIFIC WASTE MANAGEMENT

This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to **sustainably and cost effectively improve regional management of waste and pollution.**

INTRODUCTION TO COMPOSTING



**PACWASTE PLUS PROGRAMME
REGIONAL ORGANICS
MANAGEMENT PROJECT**

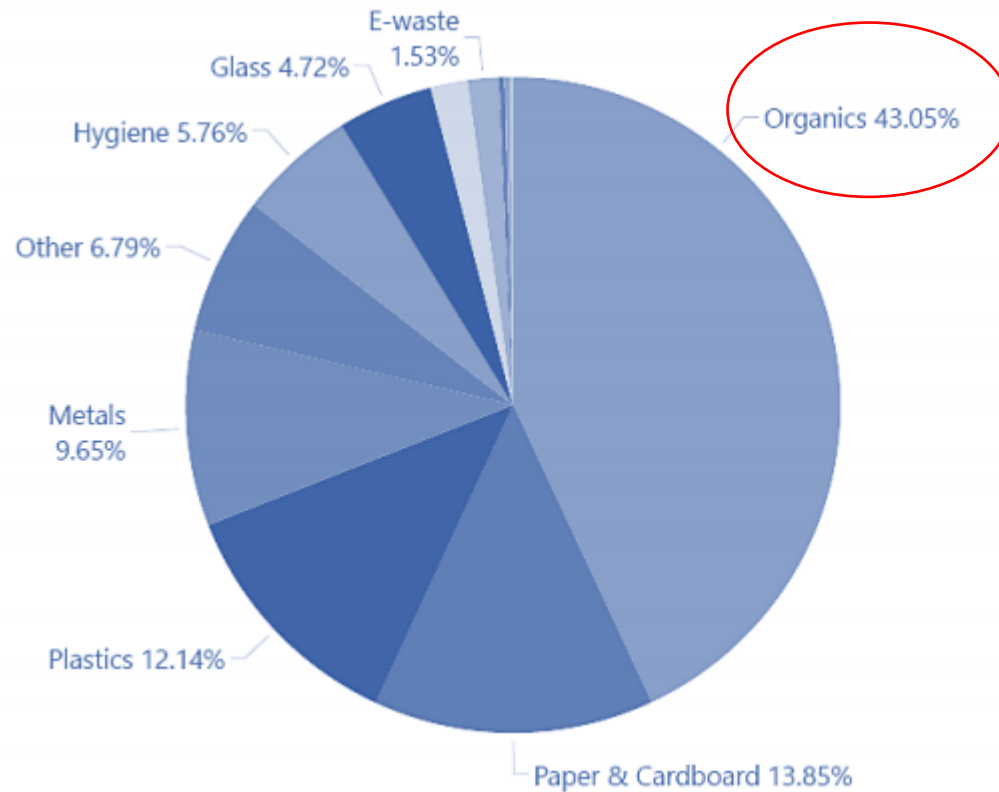
The PacWaste Plus Programme

www.pacwasteplus.org

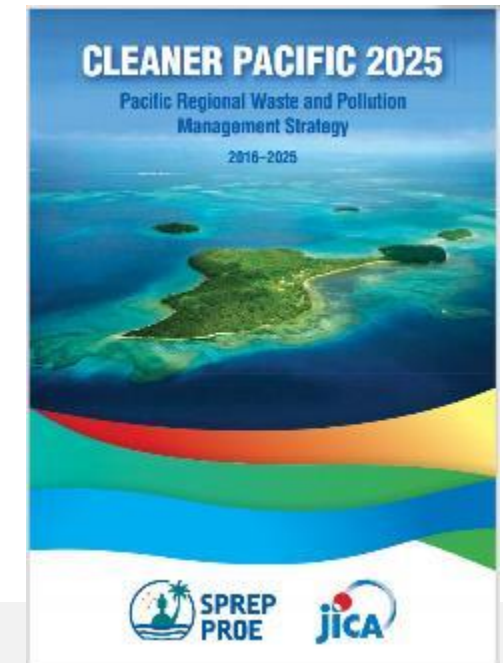
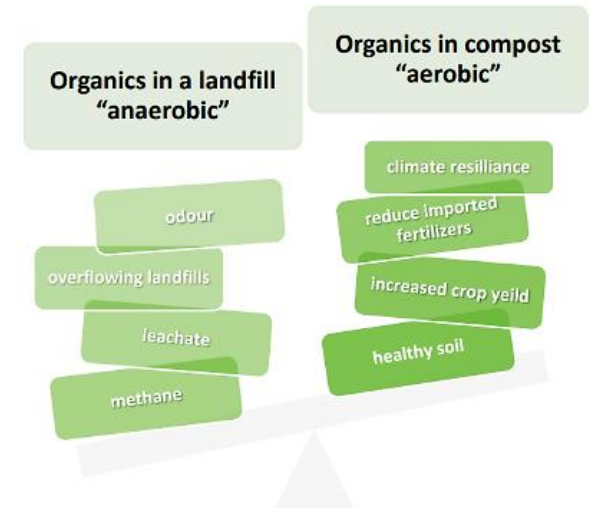


- The Pacific – European Union (EU) Waste Management Programme, PacWaste Plus
- Implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP)
- Aims:
 - Improve economic, social, health, and environmental benefits.
 - Enhancing existing activities
 - Building capacity and sustainability into waste management practices.

Context



Average MSW composition for the region (% by weight)



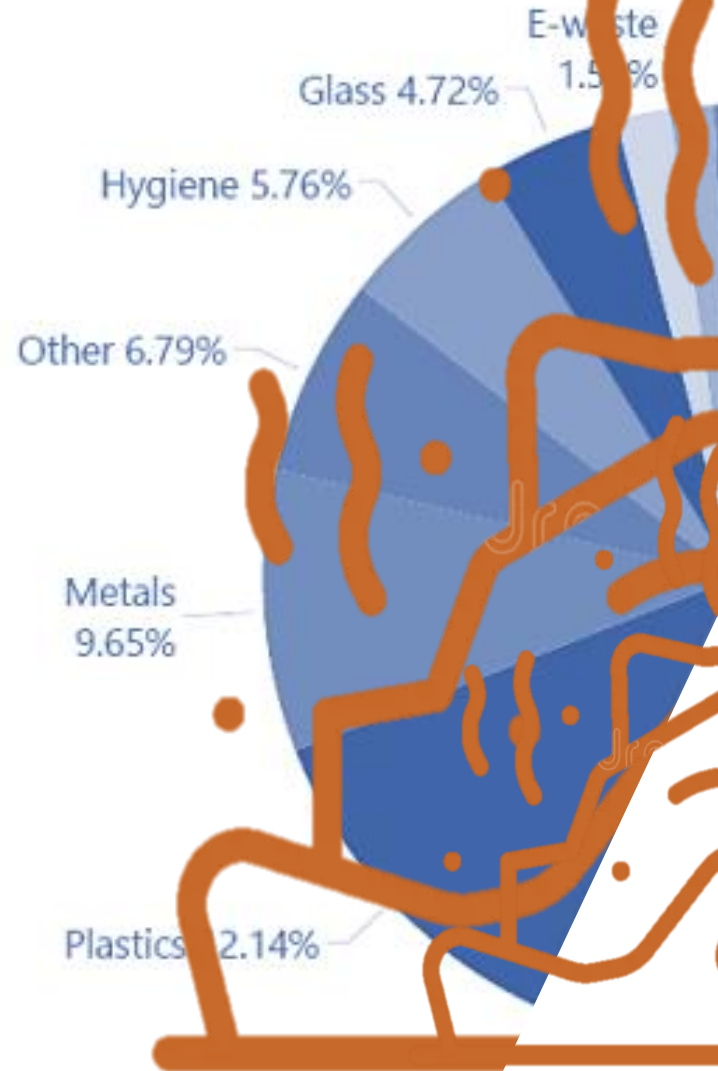
Odour

Methane

Leachate

Landfill capacity

Cost



56.9% =

Returning nutrients

Healthy soil / crop yield

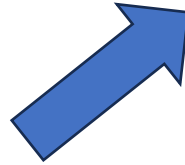
Employment

Climate resilience

Savings

Less chemicals

Where can we be?





Activity: Current Composting Process / Understanding Existing Knowledge

Activity Time: 15 mins



Principles for Effective Composting



Composting: Terminology



Organics or Organic Material

Materials that were once part of a living thing.
Can include: garden cuttings, grass and branches



Mulch

Woody and garden organic materials, once shredded,
but before undergoing a composting process



Composting

A natural biochemical process - naturally occurring microorganisms transform raw organic materials into compost products



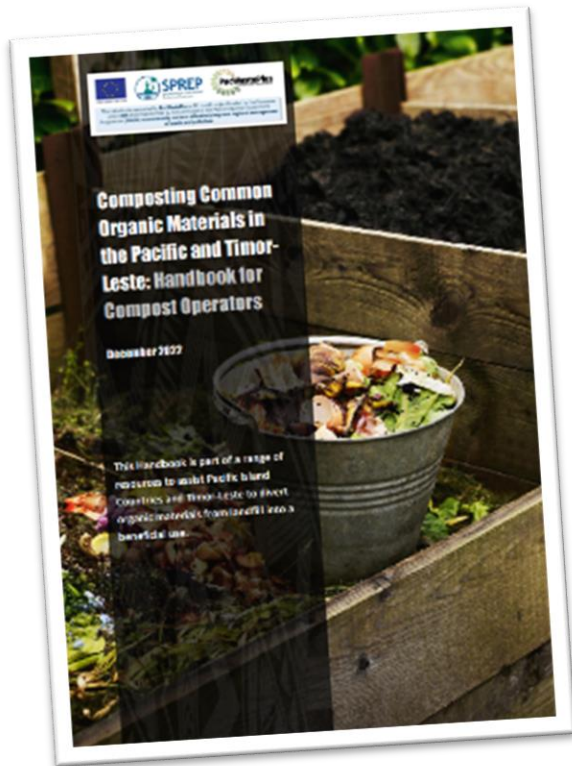
Compost

Organic material that has been broken down during composting, looks and smells like dark, fertile garden soil

Compost is more than
the sum of its parts;
it is an ecosystem.



Common Organic Materials found in the Pacific



Palm & Flax



Coconut Husks



Copra By-product



Fish By-product



Coffee By-product



Beer By-product



Noni By-product



Sugarcane By-product



Molasses



Yard / Community



Plantation / Harvest



Food Organics



Paper & Cardboard



Sawdust



Seaweed



Noxious Weeds



Cooking Fire Ash



Animal Manure



Crushed Coral



Crushed Seashells

Legend (see Section 2.1 for more details):

High Carbon Items



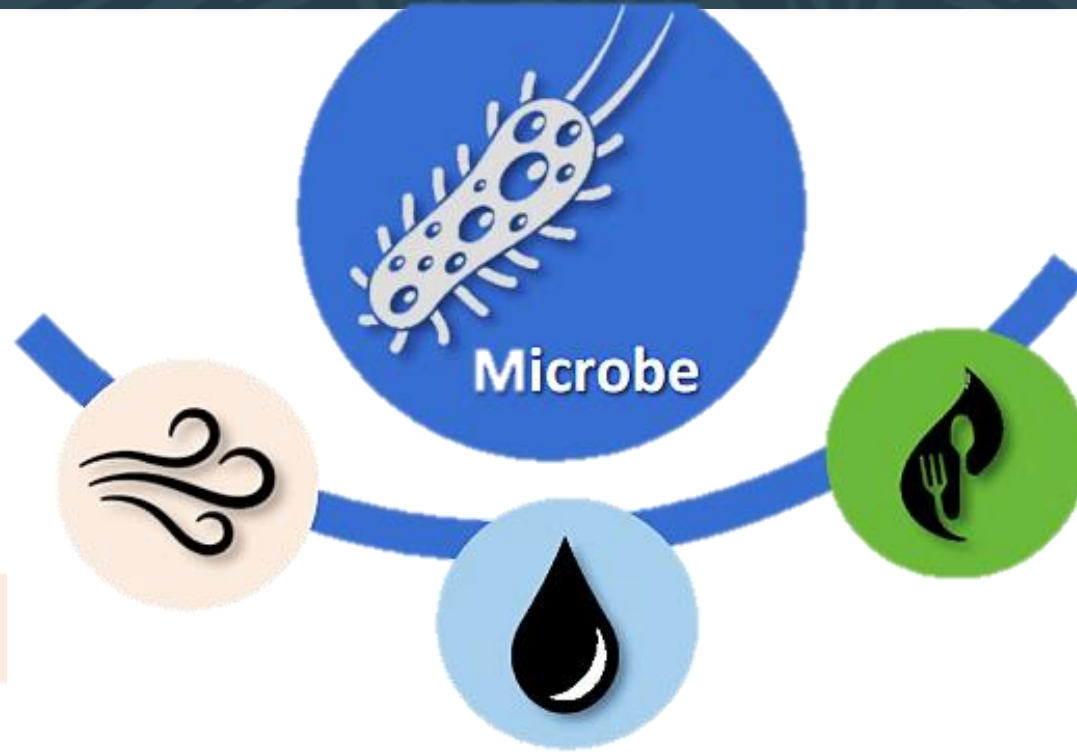
High Nitrogen Items



Neutral Carbon / Nitrogen



How Does it Work?



Air

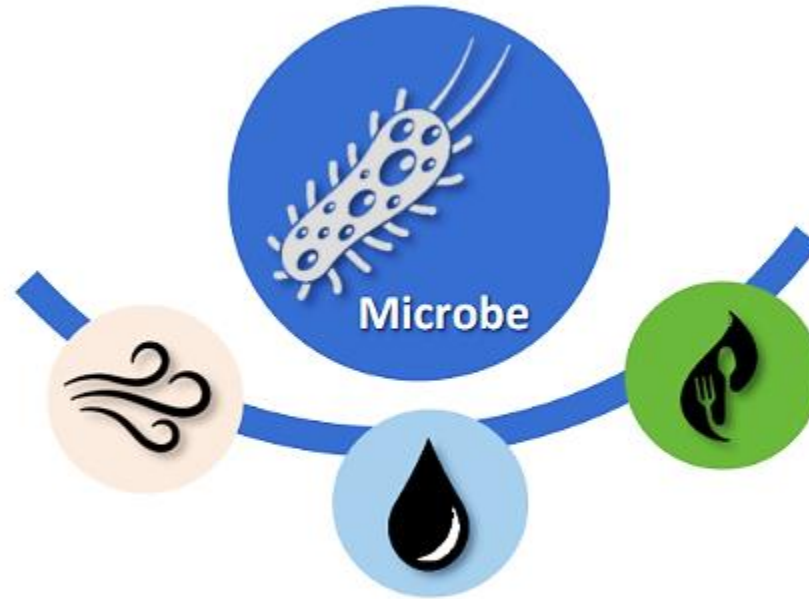
Oxygen provides microbes air to breath. Oxygen makes the composting process work faster and more effectively, and it also reduces likelihood of a compost pile producing bad odour.

Water

Water provides the microbes liquid to drink. Microbes will dehydrate if the compost pile is too dry but will drown if the compost pile is too wet, slowing down the microbes and producing bad odour.

Food

Microbes eat organic material to create compost. Microbes need the right sort and balance of food to be effective at creating compost, the two key nutrients are “carbon” and “nitrogen”

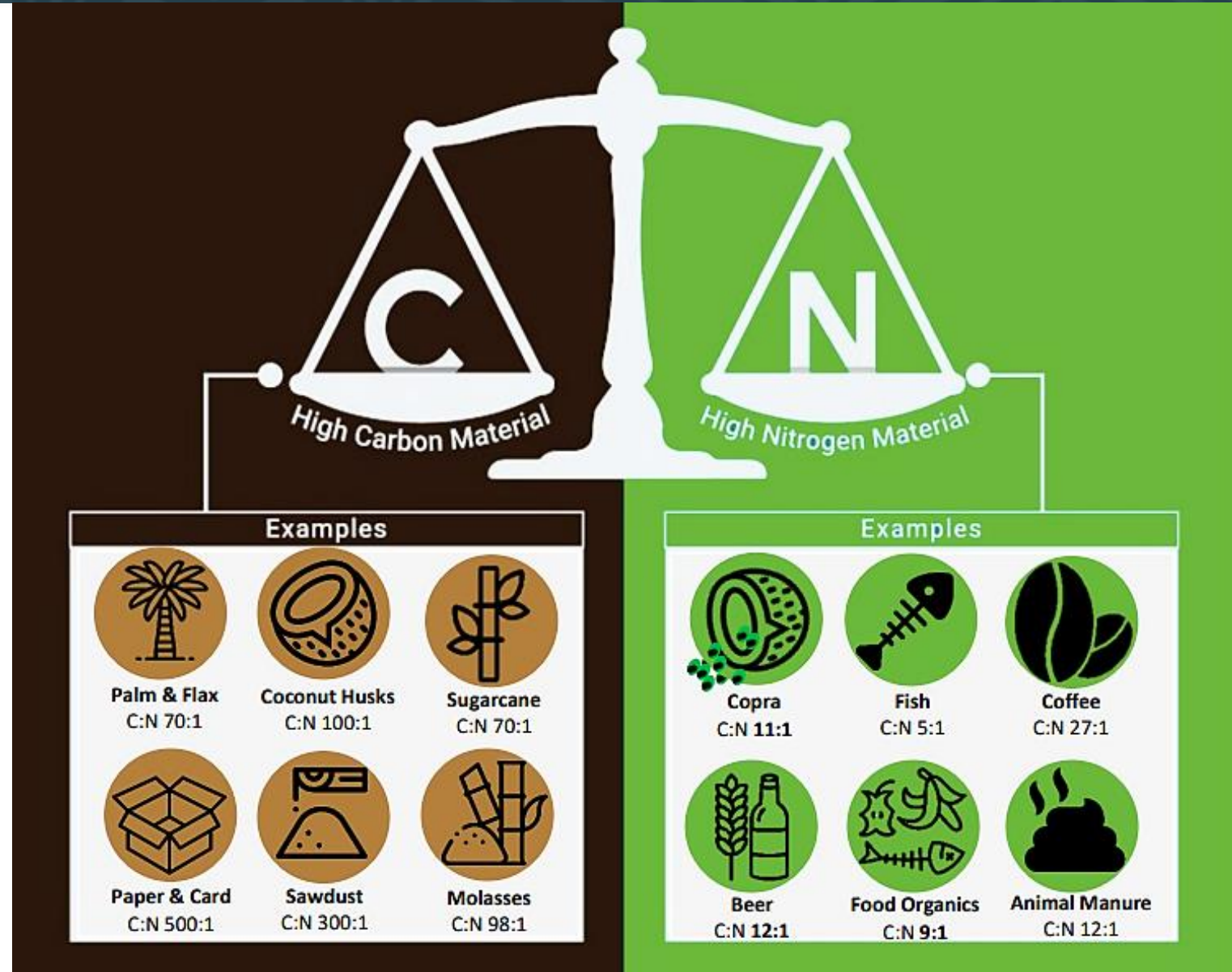


TIME



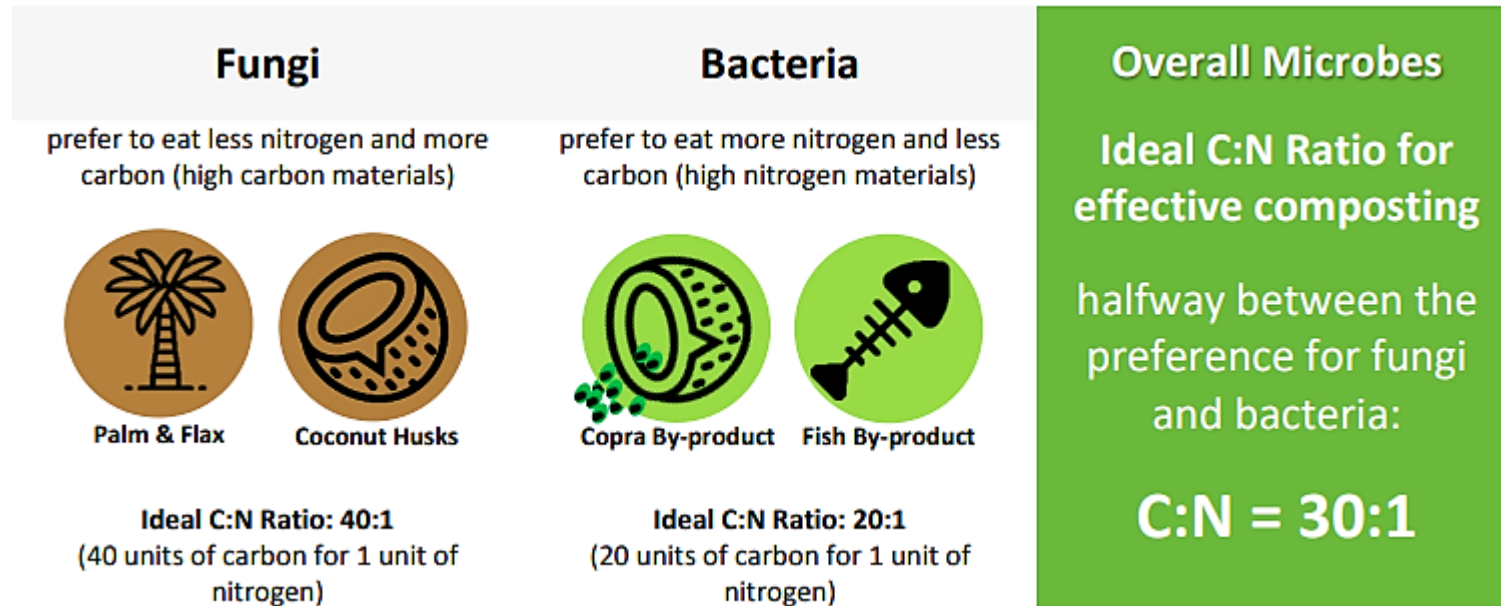
How do we add: Food

The Carbon to Nitrogen Ratio



The Carbon to Nitrogen Ratio

- Calculating correct C:N Ratio for effective composting
- This helps to understand how microbes behave
- Two main groups of microbes:



*Microbes in a compost pile use carbon as a source of energy
Nitrogen for building cell structure*

How do we add: Water



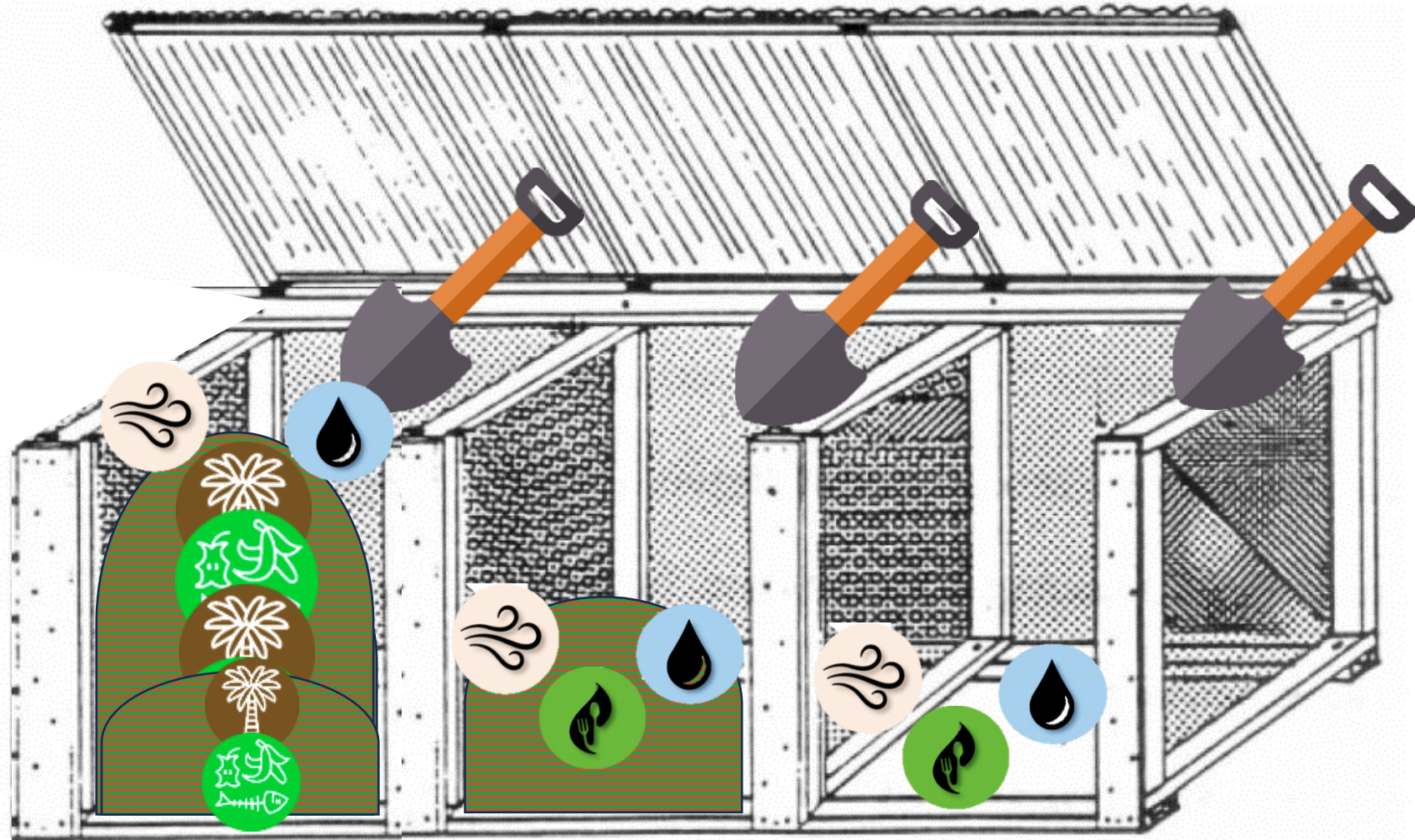
- Add in “damp” materials e.g. leaves, food scraps
- Add water at the start of the process
- Add water during the process if the bay gets dry
- Several options:
 - Bucket
 - Hose
 - Sprinklers, etc
- Don't forget to mix



How do we add: **Air**



- Variety of particle sizes – small and large
- Turning during the process to “fluff up” the bay



How do we add: **Air** **Turning the Pile**



How do we add: **Air** **Mixed Particle Sizes**

- Variety of particle sizes – small and large
- Shredding larger material assists the microbes and provides air pockets in the compost piles



Shredder Selection: Drum Shredder

Suitability of “Drum” Shredders over Disk Shredders in the Pacific

Power and Durability: strong motors and durable components, less prone to wear and tear

Faster Processing: continuous and more efficient shredding

Safer Processing: drum blades do not get “caught up” with fibrous vegetation (common in disk shredders) – less need for staff to interact closely with the blades

Lower Maintenance: rugged design and fewer moving parts, requiring less frequent maintenance



Material focus

Palm and flax



AIR

Helpful for aeration



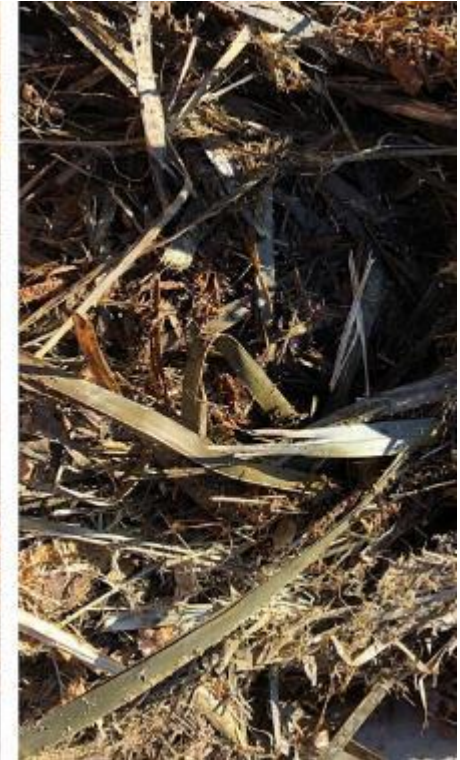
WATER

May impede water retention



FOOD

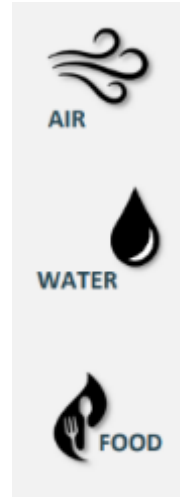
High in carbon



Material focus

Coconut husks

Whole coconut husks or shredded

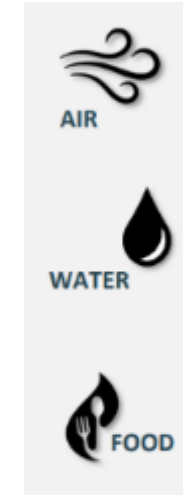


Helpful for aeration

Helpful for water

High in carbon

Powdered coconut husks



Impedes aeration

Impedes water retention

High in carbon



Source: [Coconut husk, biomass from coconut: fibers are known as coir \(lampoongmagazine.com\)](http://lampoongmagazine.com)



Source: [The Benefits of Coconut Husk as a Growing Medium – Unsolicited Plant Talks - Online Store \(gengoodmk.shop\)](http://gengoodmk.shop)



Material focus

Yard / community clean- up



AIR

Helpful for aeration



WATER

Helpful for water



FOOD

Carbon/ neutral



Material focus

Animal manure



May impede aeration

May impede water retention

High in nitrogen



Source: [Animal Manure - POD | Easy Edible Gardening \(podgardening.co.uk\)](http://podgardening.co.uk)



Material focus

Fish processing by-product

- Size of input to be considered



May impede aeration



Helpful for water retention



High in Nitrogen



Source: [The new hybrid? Blending plant-based proteins with fish by-products, algae, and insect larvae \(foodnavigator.com\)](https://foodnavigator.com)



Source: [BLUEPEACE blog » FISH WASTE: POTENTIAL REVENUE DUMPED INTO THE SEA \(bluepeacemaldives.org\)](https://bluepeace.org)



Monitoring and Reporting

KOGA TUKU O TE FAKATUPUGA 3
BAY 3

Asiga | Asotakitasi
Daily Check

TE VELA O SE MEA
Temperature

MANOCHI
Moisture

TAAGA | ACTIONS:

Galuega o te aso

NOTICE BOARD

EA, VAI, MEAKAI AASI
AIR, WATER, FOOD CHECK

DONONO
Aerobic state

VAE
Aerobic or anaerobic

TE VELA O SE MEA
Temperature

MANOCHI
Moisture

TAAGA | ACTIONS:

Galuega o te aso

NOTICE BOARD

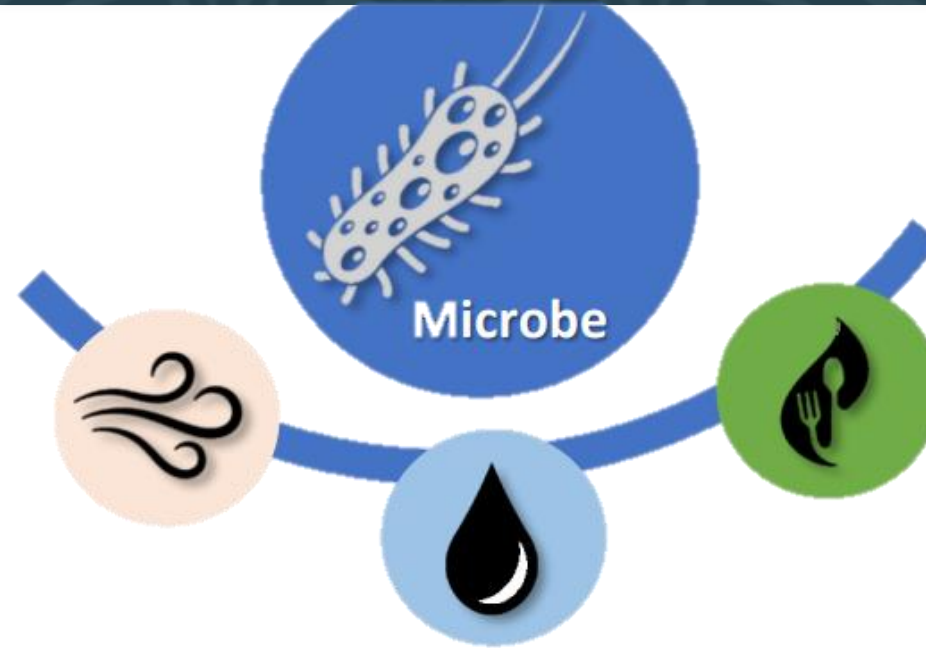
Checking on compost

Air

Visually inspect the compost pile to confirm it has a mix of large and small items, with large pieces (enabling air to flow through).

If there is a foul odour, it may indicate insufficient airflow.

If there is a foul odour and/or the compost material is clumped together, turn the pile and add additional items that are “Helpful for aeration” (from **Section 3**)



Water

Compost should be damp to the touch but not too wet. To assess water content, collect a handful of material and squeeze-if a just few drops of water are released the moisture content is about right.

If there is a foul odour, it may indicate too much moisture (*restricting airflow*).

If the compost is too dry, add water or additional items that are “Helpful for water retention” (from **Section 3**)

If the compost is too wet, turn the pile and add additional dry items that are “Helpful for aeration” (from **Section 3**)

Food

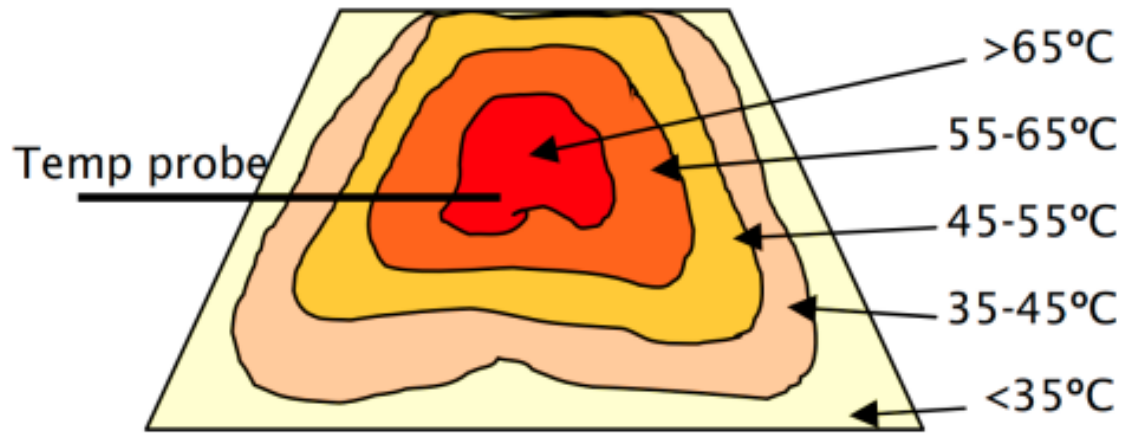
If too much **nitrogen** the compost may appear wet and soggy (*due to an excess of nitrates*). There will also be a bad ammonia-like smell. Excessive nitrogen may be detected through monitoring temperature, too much nitrogen will have a high temperature.

If there is a foul odour and/or a surplus of **high-nitrogen** materials (*i.e., materials that are fresh, flexible, and moist*), turn the pile and add additional items that are “High Carbon” (from **Section 3**)

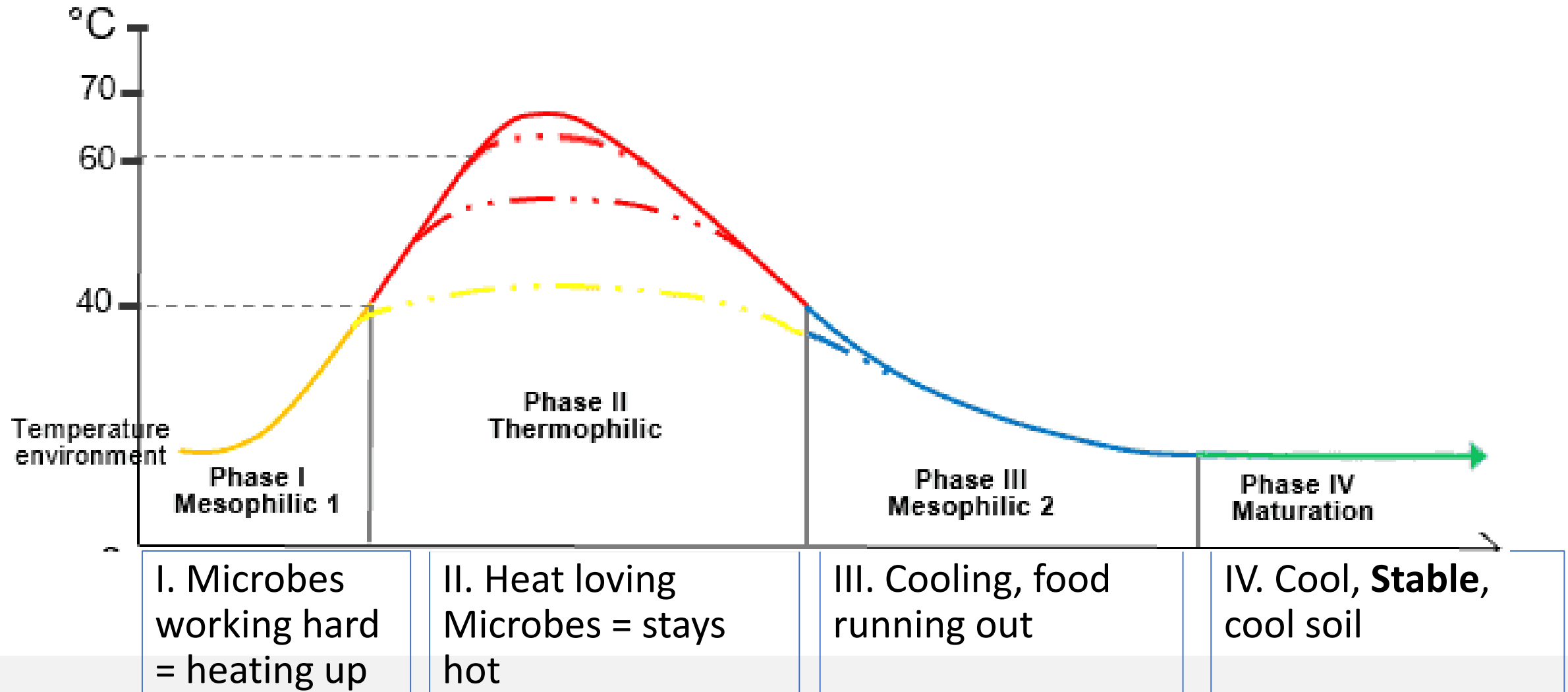
If too much **carbon**, the compost in the pile will be dry and be very slow to decompose. Excessive carbon may also be detected through monitoring temperature, too much carbon will have a low temperature.

If the composting process has stopped and there is a surplus of **high carbon** (*i.e., materials that are old, rigid, and dry*), turn the pile and add additional items that are “High Nitrogen” (from **Section 3**)

Monitoring – temperature and moisture



Composting phases

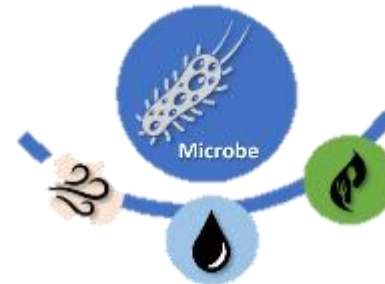


Monitoring and reporting – hands on

Why monitor?



What and how?





Checking Performance



LOOK

Visually inspect the pile



Does it look...

dry & crispy

loose, mixed sizes

wet & soggy, clumped

FEEL

Squeeze a handful of material



Does it feel...

dry & crispy

moist but not too wet

wet & soggy

TEMP

Measure with probe or spade



Does it feel...

cool (<115°F)

warm (~130°F)

hot (>150°F)

SMELL

Carefully smell the material



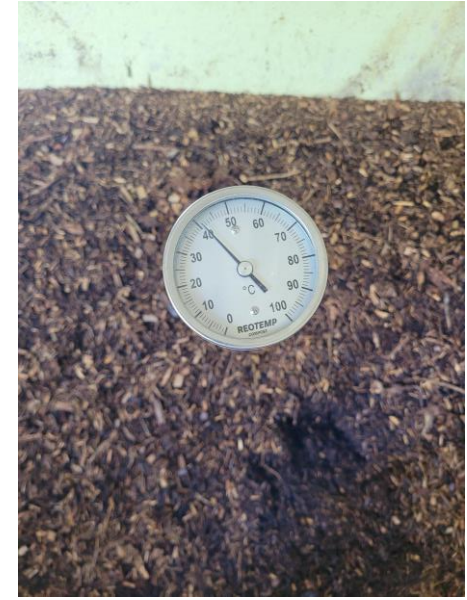
Does it smell...

like "nothing"

good like "earthy"

"bad" like rotten egg

Checking Temperature



Reporting / Documenting Composting Process

- Recording sheet / notice board
 - Volume in
 - Date last turn
 - Date last Air, Water, Food check
 - Volume out
- Check Bays
 - Air, Water, Food
 - Contaminants
- Check Dumping Areas
 - Visually inspect
 - Noxious weeds, plastic, rocks present?

KOGA TUKU O TE FAKATUPUGA 3
BAY 3

Asiga i Asotakitasi
Daily check

Te aso o te vae
Date of check

Te aso o te vae
Date of check

Te aso o te vae
Date of check

Po masina aasi: Date of check	Oonoono Look	Vae Food	Te vae o se mea Temperature	Manogi Smell
	☐ Maai ☐ Looi ☐ Sui	☐ Maai ☐ Looi ☐ Sui	☐ Maai ☐ Looi ☐ Sui	☐ Maai ☐ Looi ☐ Sui
Te vae o se mea: Temperature				
Galuega ne fai/ tusitusiga fakamau Active status: active				

Te aso o kave ei
On transfer day

NOTICE BOARD

Galuega o te aso

1. Ea, vai, meakai aasi - faga & faaputuga uma
Air, water, food checks - all bays & piles
2. Fuliga o fakatupuga mo mata
Transfer bays & piles per schedule
3. Maua kae kati kaiga fakapala
Receive & shred new material
4. Fa'aliloga te vae o te koga tuku 1
Form batch in bay 1
5. Fakamaa kae fao ki faga kaisa ko toka
Screen & bag finished compost
6. Fulu ke mea kae atafai o tou mea faigaluega
Clean & maintain tools and equipment
7. Teu kae fulu te koga ke ma
Sweep & clean facility
8. Faatumu le tui fa'amaumauga
Fill in logbook

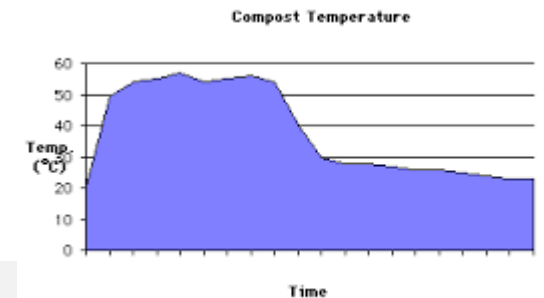
ONOONO FAKALEI KI KAIRO I ASO TAKITASI
MONITOR COMPOST

OONOONO VAE TE VAE O SE MEA MANOGI

KAIRO MO MATUA

WAILAKAU FAKAMATAKU E ISI TE KOGA NEI | HAZARDS ON SITE

WAI FA'AGAIOGA FA'AGAIOGA MO FAIGA FA'ATITIA



Data Collection





This initiative is supported by PacWastePlus a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Organic Management and Composting Daily Data Collection Template

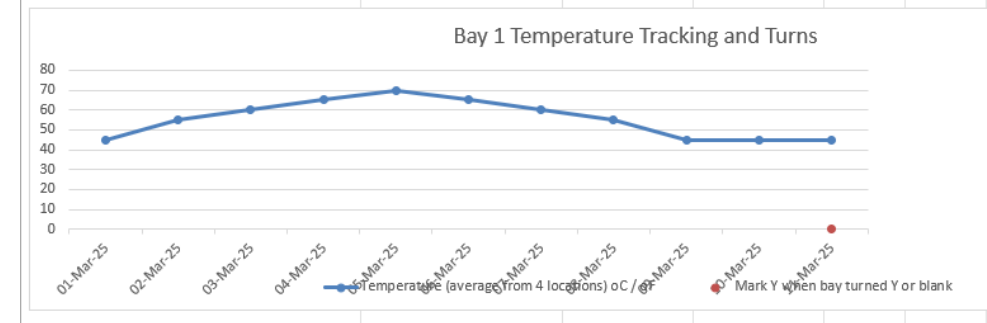
Daily Data Collection Template

Facility Name					
Date					
Staff on duty					
Chipper Operation					
Chipper operating hours	hours				
Comments / maintenance needed					
Estimated pre chipped volume	estimated m3 / y3 / truck volume				
- % material type					
- Dry, rigid, brown material	%				
- Fresh, flexible, green material	%				
Estimated post chipped volume	estimated m3 / y3 / truck volume				
Comments					
Other Actions					
Was equipment maintained today?	Y/N				
Types of maintenance complete					
Maintenance issued detected					
Describe other tasks complete	i.e., litter pick up				
Issues to raise / actions for follow-up					
Compost produced					
Compost Made / Bagged	estimated m3 / y3 / # bags				
	estimated m3 / v3 /				

Compost produced	
Volume added to Bay 1	364
- Dry, rigid, brown material	57%
- Fresh, flexible, green material	43%
Compost Made / Bagged	87
Compost Sold	52

Composting Process

Bay 1



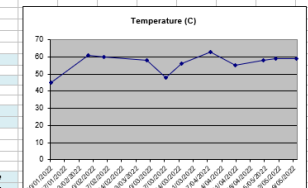




This initiative is supported by PacWastePlus a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Template for Monitoring Compost Process Static Pile

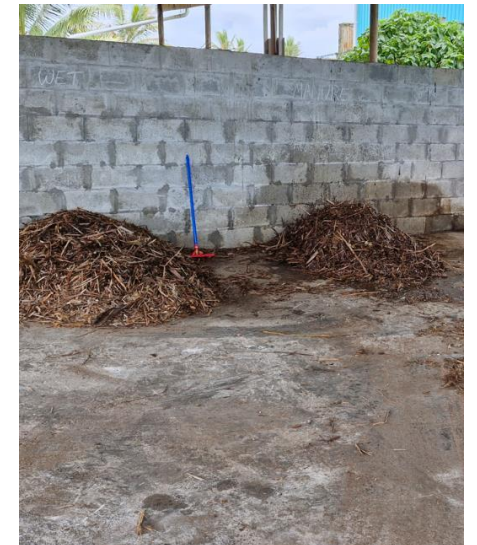
Batch Number / Name:	Batch #1		Insert name for batch											
Input Materials	Vol (m3)	Proportion (%)												
Shredded garden organics	4.7	49												
Pig manure	1.2	13												
Market organics	2.4	25												
Shredded cardboard	1.3	14												
	Insert other organic material type include in batch													
Volume of material composted:	9.6	m ³												
Date mixed / started:	20/1/22	enter date batch started												
Date composting finished:	24/7/22	enter date batch finished												
Days composted:	184													
Date sold / used:	17/6/22	enter date compost sold												
Days composted & matured:	207													
Monitoring Results														
DATE	20/1/22	7/2/22	15/2/22	8/3/22	17/3/22	25/3/22	8/4/22	20/4/22	4/5/22	10/5/22	20/5/22	-43340	-43340	enter date of lab testing
Age of Batch (d)	0	17	25	48	57	65	78	90	104	120	134			enter temperature reading
TEMP (°C)	45	51	60	58	48	56	63	55	58	53	59			
pH	5.87	5.31	4.57	4.50	5.36	5.49	5.20	5.77	5.82	5.63	5.68			enter pH reading rep 1
Rep 1	5.69	5.26	4.47	4.49	5.30	5.47	5.24	5.78	5.85	5.56	5.64			enter pH reading rep 2
Mean pH	5.68	5.29	4.52	4.50	5.33	5.48	5.22	5.78	5.84	5.63	5.66			
Std Error	0.01	0.04	0.07	0.01	0.04	0.01	0.03	0.01	0.02	0.03	0.03			
EC (Conductivity (Soluble Salts))														
Rep 1	0.41	0.36	0.31	0.30	0.34	0.28	0.35	0.35	0.44	0.37	0.46			enter EC reading rep 1 mmhos/cm
Rep 2	0.49	0.33	0.30	0.31	0.35	0.27	0.36	0.35	0.38	0.37	0.46			enter EC reading rep 2 mmhos/cm





Activity: Setting Up Compost Pile

Activity Time: 60 mins







Organic Management and Composting Daily Data Collection Template

This initiative is supported by PacWastePlus-a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Daily Data Collection Template						
Facility Name						
Date						
Staff on duty						
Chipper Operation						
Chipper operating hours	hours					
Comments / maintenance needed						
Estimated pre chipped volume	estimated m3 / y3 / truck volume					
- % material type						
- Dry, rigid, brown material	%					
- Fresh, flexible, green material	%					
Estimated post chipped volume	estimated m3 / y3 / truck volume					
Comments						
Other Actions						
Was equipment maintained today?	Y/N					
Types of maintenance complete						
Maintenance issued detected						
Describe other tasks complete	i.e., litter pick up					
Issues to raise / actions for follow-up						
Compost produced						
Compost Made / Bagged	estimated m3 / y3 / # bags					
	estimated m3 / v3 /					

KOGA TUKU O TE FAKATUPUGA 1

BAY 1
 1
 3rd Aug

Asiga i Asotikaitasi
Daily check


Te Air


Te Water


Te Food

Igon o te vaega
Po te maitaina e tui ei
Te aso e tui ei te mata o te fakatupuga

Po masina aas:	Qanoono	Vae	Te vela o se mea	Manogi
Date of check	Location	Feet	Temperature	Smell
6 Aug	☒ Hale ☐ Teo ☐ Siu	☐ Moku ☒ Moku ☐ Siu	☐ Moku ☒ Moku ☐ Vela	☐ Seal ☒ Lei ☐ Masol
Te vela o se mea:	1 33	2 41	3 35	4 35
Galuega ne fai / tusitusiga fakamau				

Te aso e kave oi
On transfer day

1

2

Trouble-shooting



Trouble-shooting



LOOK

Visually inspect the pile



Does it look...

FEEL

Squeeze a handful of material



Does it feel...

TEMP

Measure with probe or spade



Does it feel...

SMELL

Carefully smell the material



Does it smell...

dry & crispy

loose, mixed sizes

wet & soggy, clumped

dry & crispy

moist but not too wet

wet & soggy

cool (<115°F)

warm (~130°F)

hot (>150°F)

like "nothing"

good like "earthy"

"bad" like rotten egg

any Brown?

May need:



1: Add Water
2: Add "nitrogen"

any Red?

May need:



1: Turn Pile
2: Add "carbon"

all Green?

No action needed



Activity: Compost Scenarios

1. Go through each scenario
2. Discuss what is out of balance from the 3 key components (air, water, food) and brainstorm how you could fix it.

Activity Time: 30min







Source: [What Makes Good Compost? » Direct Compost Solutions](#)





Managing your facility



Weather

- Why manage?
 - Effective composting
- What we need to avoid
 - Heavy rain
 - Too much moisture in compost
 - Heat
 - Compost will dry out
 - Overheating of compost – fire, composting process stops
- How to manage
 - Cover composting areas/ piles
 - Capture rainwater for use
 - Daily checks for compost



Contamination - Physical and Chemical

- Why manage?
 - Affect compost quality
- What we need to avoid
 - May impact health of staff
- How to manage
 - Reject materials
 - Remove before shredding
 - Stockpile and allow to degrade before being able to cut up
 - Transfer to recycling or landfill



Large / Oversize



Pesticides



Plastics, Metal, Glass



Rocks and soil

Surface Water and Groundwater Contamination

Surface Water and Groundwater

- Why manage?
 - To prevent contamination of waterways and land
 - Capture water (use to keep compost moist)
- What we need to avoid
 - Don't add to much water
 - Cover composting areas/ piles in bad weather
- How to manage?
 - Daily checks on moisture and adjust
 - Cover composting area (if possible)
 - Install hardstand area and leachate capture



Pathogens and Weeds

- Why manage?
 - Ensure staff and visitors have protective equipment (masks, gloves)
 - When establishing composting mix
 - When turning/moving materials
- What we need to avoid
 - Weeds – remove from incoming material before shredding
- How to manage?
 - Hot composting (to kill pathogens and some weeds)



Odour, Dust and Noise

- Why manage?
 - Ensure staff and visitors have protective equipment
 - When establishing composting mix
 - When turning/moving materials
- What we need to avoid
 - Weeds – remove from incoming material before shredding
- How to manage?
 - Hot composting (to kill pathogens and some weeds)



Fire

- Why manage?
 - Safety of staff and environment
- What we need to avoid
 - Overheating in compost piles
 - Too large (heat can't escape)
 - Too dry
 - Sparks ignition
 - Lightening, equipment
- How to manage:
 - Contingency plan
 - Water onsite
 - Good composting practice



Machinery

- Why manage?
 - Safety of staff and volunteers
 - Longevity of equipment and facilities
- What we need to avoid
 - Stay clear of heavy moving vehicles
- How to manage:
 - Good communication
 - Regular maintenance

Fakagalua masini
lasi



Heavy vehicle
operation



Fa'agalolga fa'apala



Shredder operation



General access, site security

- Why manage?
 - Public safety
 - Security of equipment and facilities
- What we need to avoid
 - General public access site and being exposed to safety risk
- How to manage:
 - Secure all gates at the end of each day
 - Clear signage for accessible areas



Litter and site cleanliness

- Why manage?
 - Avoidance of pests
- What we need to avoid
 - Contamination and litter being blown around site
- How to manage:
 - Secure storage of rejected materials
 - Daily site-clean up



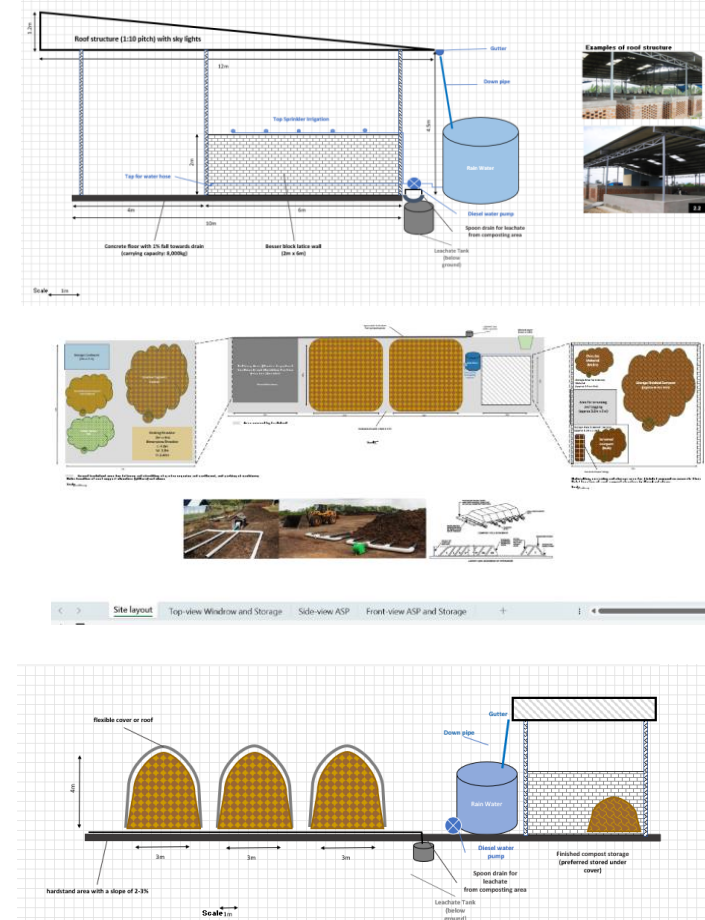
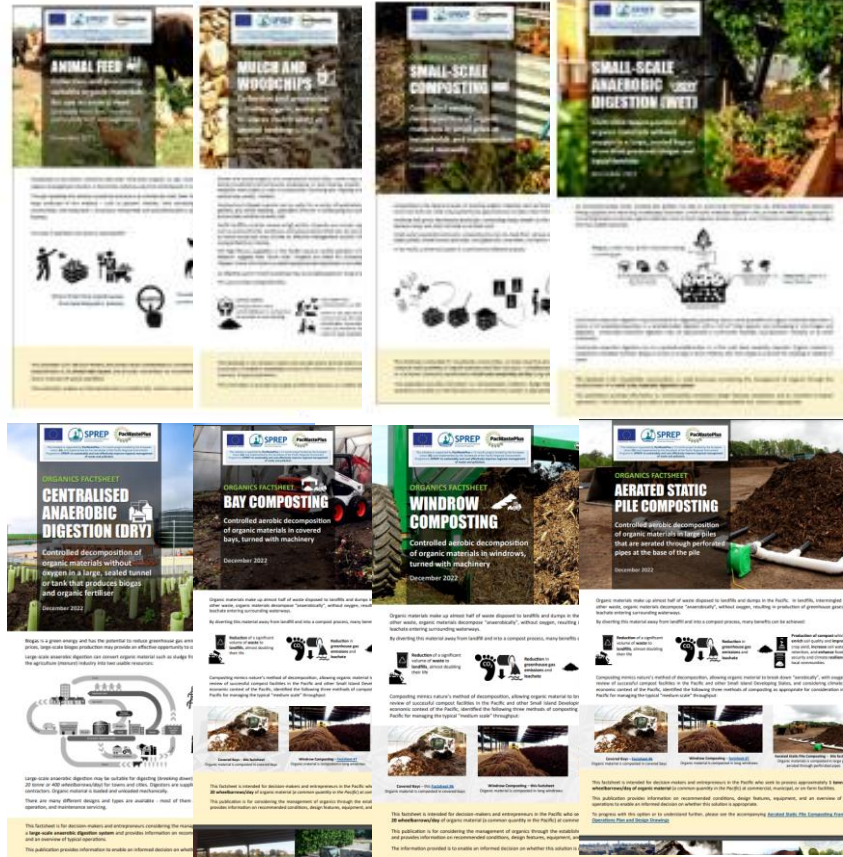
Further Reading / Resources Available

Questions:

- | | |
|---|---|
| 1 | What is your weight of organic material to be processed daily? |
| 2 | What is the "Carbon" v "Nitrogen" ratio of your organic materials? |
| 3 | What is your main source of Nitrogen input? |
| 4 | How much budget is available for establishing facilities and equipment? |
| 5 | How much budget is available for ongoing operations (excluding labour)? |
| 6 | How much labour is available (including volunteers)? |
| 7 | What level training do your staff or volunteers have? |
| 8 | What level of workshop support do you have for equipment maintenance and servicing? |
| 9 | How sensitive is your surrounding area? |

Ranked - Possible Organics Management Solutions for your Context:

1st	Small Scale Composting (Manual)
2nd	Bay or Windrow Composting (with Mechanical Support)
3rd	Small Scale Anaerobic Digestion
4th	Aerated Static Pile Composting (with Mechanical Support)
5th	Mulch and Woodchip
6th	Animal Feed
7th	In-vessel Compost
8th	Centralised Anerobic Digestion (Dry)



FRAMEWORK

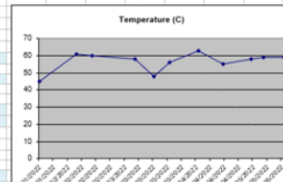
Standard Operating Procedure – Bay Composting
[your facility] Organics Processing Facility

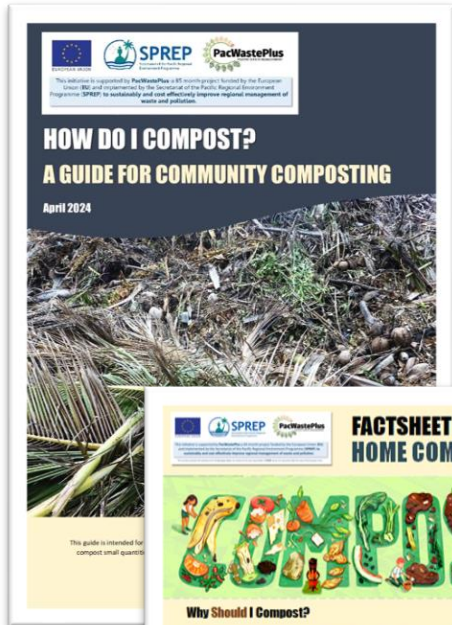
Date of last revision: _____



Template for Monitoring Compost Process Static Pile

Batch Number / Name:	Batch #1	Batch name for batch
put Materials	Vol (m3)	Proportion (C)
redded garden organics	4.7	43
manure	12	13
silver organic	2.4	25
redded cardboard	13	14
other organic material type include date batch	0	0
volume of material composted:	3.6 m ³	
date mixed / started:	20/1/22	enter date batch started
date composting finished:	24/7/22	enter date batch finished
days composted:	184	
date sold / used:	17/8/22	enter date compost sold
days composted & matured:	207	
Monitoring Results		
ATE of Batch (d)	20/1/22	enter date of lab testing
MP (°C)	45	enter temperature reading
pH	5.67	enter pH reading rep 1
pH	5.69	enter pH reading rep 2
EC	0.01	enter EC reading rep 1
EC	0.01	enter EC reading rep 2
EC	0.01	enter EC reading rep 3
EC	0.01	enter EC reading rep 4
EC	0.01	enter EC reading rep 5
EC	0.01	enter EC reading rep 6
EC	0.01	enter EC reading rep 7
EC	0.01	enter EC reading rep 8
EC	0.01	enter EC reading rep 9
EC	0.01	enter EC reading rep 10
EC	0.01	enter EC reading rep 11
EC	0.01	enter EC reading rep 12
EC	0.01	enter EC reading rep 13
EC	0.01	enter EC reading rep 14
EC	0.01	enter EC reading rep 15
EC	0.01	enter EC reading rep 16
EC	0.01	enter EC reading rep 17
EC	0.01	enter EC reading rep 18
EC	0.01	enter EC reading rep 19
EC	0.01	enter EC reading rep 20
EC	0.01	enter EC reading rep 21
EC	0.01	enter EC reading rep 22
EC	0.01	enter EC reading rep 23
EC	0.01	enter EC reading rep 24
EC	0.01	enter EC reading rep 25
EC	0.01	enter EC reading rep 26
EC	0.01	enter EC reading rep 27
EC	0.01	enter EC reading rep 28
EC	0.01	enter EC reading rep 29
EC	0.01	enter EC reading rep 30
EC	0.01	enter EC reading rep 31
EC	0.01	enter EC reading rep 32
EC	0.01	enter EC reading rep 33
EC	0.01	enter EC reading rep 34
EC	0.01	enter EC reading rep 35
EC	0.01	enter EC reading rep 36
EC	0.01	enter EC reading rep 37
EC	0.01	enter EC reading rep 38
EC	0.01	enter EC reading rep 39
EC	0.01	enter EC reading rep 40
EC	0.01	enter EC reading rep 41
EC	0.01	enter EC reading rep 42
EC	0.01	enter EC reading rep 43
EC	0.01	enter EC reading rep 44
EC	0.01	enter EC reading rep 45
EC	0.01	enter EC reading rep 46
EC	0.01	enter EC reading rep 47
EC	0.01	enter EC reading rep 48
EC	0.01	enter EC reading rep 49
EC	0.01	enter EC reading rep 50
EC	0.01	enter EC reading rep 51
EC	0.01	enter EC reading rep 52
EC	0.01	enter EC reading rep 53
EC	0.01	enter EC reading rep 54
EC	0.01	enter EC reading rep 55
EC	0.01	enter EC reading rep 56
EC	0.01	enter EC reading rep 57
EC	0.01	enter EC reading rep 58
EC	0.01	enter EC reading rep 59
EC	0.01	enter EC reading rep 60
EC	0.01	enter EC reading rep 61
EC	0.01	enter EC reading rep 62
EC	0.01	enter EC reading rep 63
EC	0.01	enter EC reading rep 64
EC	0.01	enter EC reading rep 65
EC	0.01	enter EC reading rep 66
EC	0.01	enter EC reading rep 67
EC	0.01	enter EC reading rep 68
EC	0.01	enter EC reading rep 69
EC	0.01	enter EC reading rep 70
EC	0.01	enter EC reading rep 71
EC	0.01	enter EC reading rep 72
EC	0.01	enter EC reading rep 73
EC	0.01	enter EC reading rep 74
EC	0.01	enter EC reading rep 75
EC	0.01	enter EC reading rep 76
EC	0.01	enter EC reading rep 77
EC	0.01	enter EC reading rep 78
EC	0.01	enter EC reading rep 79
EC	0.01	enter EC reading rep 80
EC	0.01	enter EC reading rep 81
EC	0.01	enter EC reading rep 82
EC	0.01	enter EC reading rep 83
EC	0.01	enter EC reading rep 84
EC	0.01	enter EC reading rep 85
EC	0.01	enter EC reading rep 86
EC	0.01	enter EC reading rep 87
EC	0.01	enter EC reading rep 88
EC	0.01	enter EC reading rep 89
EC	0.01	enter EC reading rep 90
EC	0.01	enter EC reading rep 91
EC	0.01	enter EC reading rep 92
EC	0.01	enter EC reading rep 93
EC	0.01	enter EC reading rep 94
EC	0.01	enter EC reading rep 95
EC	0.01	enter EC reading rep 96
EC	0.01	enter EC reading rep 97
EC	0.01	enter EC reading rep 98
EC	0.01	enter EC reading rep 99
EC	0.01	enter EC reading rep 100





ORGANICS MANAGEMENT

Course Introduction and Basic Principles of Composting

Resources to assist decision makers in Pacific Island Countries and Timor-Leste to design and implement successful organics management solutions suitable for their specific scale and context.

BEGIN!

Developed by **ivote**

This initiative is supported by PacWastePlus a 12 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Case-Study: Composting

Problem Being Solved

Food waste is easily managed in Rarotonga, with most families having access to pigs, chickens, and other animals. Landscaping materials and clippings from households, hotels and growers, however, are not as easily managed, with most families and businesses choosing to burn this material.

The Titikaveka Growers Association was started as an informal association by local growers who understood there is a better way to use their "waste" material – by processing it into compost. Not all growers had the space or knowledge to make their own compost, so the association was established.

Over the years, the association evolved into a business mode of operation, now operating under Down To Earth Compost N Machinery Ltd.

Support from the New Zealand Development and Relief Agency was utilised to purchase equipment and upscale operations.

Design Details

- Operation type: Composting
- Land area: Half acre
- Buildings: 3x5m Workshop, 6x1m finished product storage bay
- Services: Water, power
- Volume product received: 15 t/ week
- Type product received: Primarily landscaping materials and clippings, by-product from fish processing
- Product received from: Hoteliers, fish processing, growers, dropped off at facility.
- Processing system employed: Large pile open window
- Volume product made: 10 m3/ week (average)
- Cost sale of product: NZD\$200/ m3
- Who purchases product: Home gardeners, flower orchards, hoteliers
- Operating expenses: Labour, diesel, oil, water, maintenance
- Full list of equipment / cost:
 - 8 tonne excavator, NZD\$43,000
 - 12 inch chipper, NZD\$60,000
 - Generator, NZD\$43,000
 - Small plant such as temperature probe, chainsaw, tools, sprinker system, slurry tank, NZD\$10,000
- Staff number: 3
- Community engagement: Word of mouth
- Donor support: New Zealand Development and Relief Agency to set up facility, NZD\$400,000
- Government support: None

Titikaveka Growers Association
Down To Earth Compost
Mr Tereva Iva - Managing Director

Organics Management

- ✓ Course Introduction and Basic Principles of Composting
- ✓ Composting Common Organic Materials in the Pacific and Timor-Leste
- ✓ Understanding and Selecting Suitable Organic Management Solutions for the Pacific and Timor-Leste
- ✓ Using the Decision Support Tool
- ✓ Guidelines and Standards for Composting and Compost Quality for the Pacific and Timor-Leste

THANK YOU FOR YOUR PARTICIPATION AND HAPPY TO ANSWER ANY QUESTIONS!

Check the programme website for publications, resources and
programme updates

www.pacwasteplus.org





Activity: Monitoring Compost Daily Checks Record Keeping

Activity Time: 60 mins

KOGA TUKU O TE FAKATUPUGA 1

BAY 1

Asiga i Asotakitasi
Daily check

Igea o te vaega
Date started: 1 3rd Aug

Po te malsina e tuli ei
Date Day started

Te aso e tuli ei te mata o te fakatupuga
Transfer day from Bay 1

En Air **Vol Water** **Meakai Food**

Po masina aasi: Date of check	Oonoono Look	Vae Feel	Te vela o se mea Temperature	Manogi Smell
<u>10 Aug</u>	☐ Molo Dry ☐ Loosi Loose ☐ Siu Wet	☐ Maguaguau ☐ Moko Moldy ☐ Siu Wet	☐ Moku moku Cold ☒ Mafu mafu Warm ☐ Vea Hot	☐ Soti Strong ☒ Ieti Good ☐ Masei Bad
Te vela o se mea: Temperature	1 <u>55</u>	2 <u>59</u>	3 <u>40</u>	4
Galuega ne fai/ tusitusiga fakamau Action taken / action	<u>2. NO BOARD</u> <u>ADD WATER</u>			

Te aso e kave ei
On transfer day

1 2



Example: Tuvalu Organics Training

KOGA TUKU O TE FAKATUPUGA 1

BAY 1

Asiga i Asotakitasi
Daily check

Igon o te vaega
Po to matsina e full ei
Te ase e full ei to mata
o te fakatupuga

1 **3rd Aug**

Te Air Water Food

Po masina aasi: Date of check	Oonoono Look	Vae Feel	Te vela o se mea Temperature	Manogi Smell
6 Aug	☒ Mole ☐ Looi ☐ Siu	☐ Mopuapu ☒ Moko ☐ Siu	☒ Mokokoko ☐ Mafafafana ☐ Vola	☐ Seai ☒ Lai ☐ Masoi
Te vela o se mea: Temperature	33	41	35	35
Galuega ne fai/ tusitusiga fakamau Actions taken / notes				

Te ase e kave ei
On transfer day

1 2



KOGA TUKU O TE FAKATUPUGA 1

BAY 1

Asiga i Asotakitasi
Daily check

Igon o te vaega
Po to matsina e full ei
Te ase e full ei to mata
o te fakatupuga

1 **3rd Aug**

Te Air Water Food

Po masina aasi: Date of check	Oonoono Look	Vae Feel	Te vela o se mea Temperature	Manogi Smell
10 Aug	☐ Mole ☒ Looi ☐ Siu	☐ Mopuapu ☐ Moko ☐ Siu	☐ Mokokoko ☒ Mafafafana ☐ Vola	☐ Seai ☒ Lai ☐ Masoi
Te vela o se mea: Temperature	55	59	40	
Galuega ne fai/ tusitusiga fakamau Actions taken / notes	CARDBOARD ADD WATER			

Te ase e kave ei
On transfer day

1 2

Example: The Marshall Islands



Example: Titikaveka Growers Association – Cook Islands



Example: Port Vila Composting



Other examples

