

Native ARC

Organic Waste Management Plan



Management Plan in Action as of: _____

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Background

Native Arc is a native animal rehabilitation clinic located in Bibra Lake. They care and rehabilitate a wide variety of birds and mammals covering a vast area. Through their day to day tasks a large amount of organic waste is accumulated including food scraps, newspaper, cardboard and animal manure.

As part of a plan to become a sustainable centre, they received a Towards Zero Waste grant for \$10 000 to implement an on-site organic waste management system. In order to find the most suitable system for the clinic a waste audit was conducted and the volunteers monitored, which found that a number of large insulated worm bins would be the easiest to manage, but also provide extra feed for the animals through harvesting worms and a healthy organic fertiliser for their gardens.

5 large 1 metre by 2 metre insulated worm bins were supplied by The Worm Shed, who have supported the process and who should be called in future for any questions or concerns. Kevin and Debbie Smith can be contacted at The Worm Shed on (08) 9571 8003, or at www.wormshed.com.au. This management plan has been adapted by The Worm Shed's guide lines so that there is a continuation of information, development and procedure.

This management plan frames the systems principles and objectives and then goes through 3 stages of management and outlines each stages timing and responsibilities requirements. It will be used as an induction document for all new volunteers who may need to take on the management tasks at Native Arc.

Principles and Objectives

The West Australian Waste Management Board and The Department of Environment and Conservation have a vision that all West Australians will live in a waste free environment by 2020. Their principles that they use have been the guiding force for this project. They are:

PRINCIPLE 1: Prevention - To avoid the creation of waste.

PRINCIPLE 2: Recovery - To efficiently re-cover, re-treat and re-use all wastes.

PRINCIPLE 3: Disposal – To responsibly manage waste into the environment.

Through this management system Native Arc wishes to enforce the second principle through their on-site system and hopes to reduce all of their organic waste going to land fill.

Their objectives are to:

- Responsibly manage and treat all of their organic waste on-site.
- Reduce their overall total of waste that goes to landfill.
- Practically train all volunteers in the worm bin system and induct all new volunteers in the understanding of the process.
- Produce a large amount of worms and castings for use on site.
- Sustain the system and its process so that it withstands future years.
- Educate and encourage the use of on-site organic waste management to all those who visit Native Arc.

Step 1- Setting Up

On arrival of the bins Kevin and Debbie Smith, with the help of the project manager will hold a half day workshop with all of the current volunteers and board members. This will allow for a hand on training session in order for everyone to gain practical experience in the process. The information and experience that everyone gains can then be passed down to new volunteers. During this session the bedding will be laid and the over all process explained.

Timing requirements: It is suggested that a one day workshop, held on a weekend will best suit the volunteers, the day that the worm bins are delivered. Lunch and drinks will be provided.

Responsibilities: This will be organised by the Program Director through liaising with Kevin from The Worm Shed. Invites to volunteers will need to be sent out 3 weeks prior to the date. Any materials needed for the bins, including lunch and drinks will be organised 1 week prior to the date.

Step 2 – Monitoring and Managing

Feeding

It is suggested that wait 24 hrs before feeding. This will allow them time to settle in.

Their feed should consist of a mix of carbon & nitrogen materials (10:1 ratio). The Carbon materials will be in the form of paper, cardboard or straw. The Nitrogen materials will be in the form of the manures and food scraps.

You will be able to feed approx 2kgs of food per day (more if mulched) to each of the worm bin.

This amount may not seem much, but it is better to underfeed than overfeed the worms. You will find that you will be able to increase this amount as the worms settle in and as their numbers increase.

Chop all 'food scraps' as small as possible. You could use a 20 litre bucket to place the food in and then chop up using a garden spade. Add a small amount of water during the chopping process. Alternatively, a mulcher will be on-site for use to break down the food, cardboard, paper and plant materials; however this must not be used unless you have gone through the safety induction.

Food scraps must be buried in the worm farm. Do not leave it lying on top. When using food scraps, mix it in with some shredded paper. Ensure the food is covered with paper and then water.

Cardboard, paper & manures should be pre-soaked (drained water can then be poured over the worm farm).

Newspaper and cardboard should be moistened and shredded.

If you are not sure whether a particular type of food is suitable or not.....try it & see.

Place (bury) a very small amount in one part of the worm farm and then observe the worms.

After a couple of days have a dig around & see if the worms are near it & are consuming it.

The worms are very clever; they will stay away (if they can) from anything that is not to their liking.

Worms will eat **garlic, onion, meat and dairy products**. These waste products can be fed to the worms as long as they only make up 2 to 5 % of their daily intake.

Citrus peels are a definite no-no.

Organic waste such as **lawn clippings and garden refuse**, which are slow to break down, should be composted first, or when it is sufficiently broken down can then be added to the worm farm.

Timing requirement: As much of the food scraps are in quite small pieces volunteers should be able to place scraps in the bins as they go, however if they are to be saved up through out the day it should take 1 hour for 1 person to separate and place the waste in the bins.

Responsibilities: Unless a team leader or volunteer has been assigned to this task it will be the responsibility of the Program Director to delegate how the waste will be placed in the bins on a day to day basis and to monitor what the worms are and are not eating. Also to induct 2-3 volunteers in the use of the mulcher.

Watering and Moisture

Worms are encased in a mucous membrane, and will dehydrate if not kept moist.

The bedding must not be allowed to dry out.

Increasing the amount of water, will proportionately increase the amount of Leachate (WormWiz) produced.

However be careful not to turn it into a *sloppy mess!*

Drained water from pre-soaking newspapers, cardboard & manures can be poured over the Worm Farm.

Cooking water drained from cooking pasta, rice and potatoes can be poured over the worm farm – the worms love the starch. Make sure the water is completely cooled before using.

Tip – a good way to test if the bedding is moist enough.....squeeze a handful of the bedding and you should get a couple of drops of liquid drip through your fingers.

Timing requirements: Watering should take place every 2nd day depending on the health and standard of your bin.

Responsibilities: It shall be the responsibility of the Program Director to delegate these tasks.

Temperature

Where possible your worm farm should be situated in a cool, shady area out of direct sunlight.

The temperature of the bedding should not exceed 25°– 26° C. Note that this refers to bedding temperature not atmospheric temperature.

Even on days of 40 degrees heat, there are measures you can take to keep your worm farm cool.

- ◇ Leaving the lid open will prevent heat building up inside the farm.
- ◇ Soaking wads of newspaper in water & placing them on the surface of the farm will give the worms a nice cool retreat.
- ◇ Placing a few frozen bottles of water on the surface will help keep the temperature down.
- ◇ Refrain from adding too much organic matter, as this can generate heat.

When using feed that is known to heat up e.g. manure, grass clippings, etc, place no more than 25 – 50mm thick layer only on one half of the surface area of the worm farm. If it does heat up, then the worms will be able to retreat to the other half of the farm.

Timing requirements: It is recommended that the temperature be checked daily which should take no more than 5 minute.

Responsibilities: The Program Director can delegate this responsibility to an appropriate volunteer.

pH Levels

The pH level of the bedding must be maintained around 6.5 to 7.

If the carbon to nitrogen ratio is kept at the recommended rate then additives should not be needed, however if the bedding becomes acidic, adding a small handful of garden lime / Dolomite will rectify this.

NEVER use builders lime!! We recommend the use of Dolomite, which is available from Garden Centres & Hardware Stores.

Sprinkle a handful on the surface, and then water it in. Be careful not to sprinkle the lime onto the worms, lift the lid & give them time to wriggle down into the bedding.

Timing requirements: The process of adding Dolomite should take 5-10 minutes.

Responsibilities: It will be the responsibility of the Program Director to delegate the monitoring of this task to someone, however it will need to be noted the store and purchase the Dolomite by the Program Director or a suitable person to take on this task.

Stage 3 – Harvesting

Harvesting the Castings

Castings look like rich, dark soil. During your time of looking after the worms you will get to recognise the Castings as distinct from the original food source.

When the bedding / Castings have built up to 3 – 4cm from the bottom of the air vent, then it is time to harvest the castings.

You can of course harvest the Castings sooner than this if you wish, simply by using one of the following methods.

1. Worms are ***controlled by food and moisture***. By feeding and watering the worms in one half of the Worm Farm only, will encourage the worms to move to that half, vacating the other half and leaving it virtually worm-free.

The worm-free Castings can then be removed, leaving approximately 100mm for bedding.

Stop feeding & watering in the other half and start feeding in the 'almost empty' half now. The worms will then move into this section and you will then be able to remove the Castings from the other half, once again leaving 100mm of Castings for bedding. Continue feeding as usual.

2. Alternatively, a process called ***light retraction*** can be used. This involves exposing the bedding to light, e.g. lifting the lid and removing any covering.

Firstly, cease feeding the worms for a week, this ensures that all food should be consumed and converted to Castings.

By stirring / ruffling the top 50mm of the bedding disturbs the worms and will drive them further down into the bedding. Ruffling / stirring up the surface several times over 10 to 15 minutes, should leave the top 50mm worm-free and ready for harvest.

Harvest that top 50mm of Castings and then repeat the above steps.

Continue this method of driving the worms down into the bedding and removing the Castings until there is approximately 100mm of bedding left.

Commence feeding as normal.

The 100mm of bedding / Castings that is left in the Worm Farm will ensure that any liquid that leaches through will be usable 'WormWiz' and it also provides a neutral home for the worms.

Timing requirements: Once a harvesting process is chosen it should take a team of 2-3 people a day to complete the 4 bins in use at one time. The job of setting up the new bins may be done on the same day if more people are helping; however it will need another half day if not.

Responsibilities: It will be the responsibility of the Program Director to monitor and guide the harvesting team and also to manage the cross over to the spare bin.

Using the Castings

Castings (Worm Poo) are a rich, organic, soluble fertilizer.

To use as a **fertilizer**, place a handful or two around the base of a plant and water it in, ideally cover over the Castings with mulch.

Castings are very dense and compact and needs to be mixed with other suitable mediums for the following uses:

- Seed Raising Mixture - 50% Castings & 50% Coarse River Sand
- Potting Mix - 15- 20% Castings & 80-85% Potting Mix
- Soil Conditioner - 2-4 litres Castings per square metre

When planting-**out**, place Castings in the hole before putting in the plant, (handful or two, or a bucketful or two depending on the size of the hole & plant).

Castings reduce transplant shock and encourage strong root development.

Ensuring that your worms are fed a varied diet will result in your Castings containing major and minor nutrients and trace elements.

A varied diet should consist of food scraps, paper, and cardboard as well as manures / compost.

Castings obtained from a properly maintained Worm Farm should have a **neutral pH** and will therefore be suitable for use on indoor plants, potted plants, seedlings, ferns, vegetables, fruit trees, lawns, flowers, roses, palms, orchids, natives etc.

Castings contains a multitude of micro-organisms which aid in fungal control and soil benevolent bacteria which helps stimulate micro activity in the soil.

Castings can be used at anytime during the plant's life i.e. seed raising, planting out seedlings, vegetative stages, flowering and even as a 'pick-me-up' for when they need an extra boost.

No matter how much is used, it will not damage your plants.

NB. To Store Castings

As the Castings will contain living organisms, microbes and possibly some worms, it must be stored in a dark, cool place.

Whatever container you use to store the Castings must have allowance for air, e.g. poke some holes in a plastic bag, or in the lid of a bucket / drum.

Timing requirements: As this is not part of managing the worm bins, no timing requirements are necessary and the fertilising the garden may be done at ones pleasure.

Responsibilities: There are no responsibilities to do with managing the worm bins; the responsibility of the new organic fertiliser becomes that of who ever keeps it.

Using the Liquid Leachate

Leachate (WormWiz) is a liquid that has *leached* through a bedding of Castings, it is not Worm wee.

If your Worm Farm is working efficiently the liquid will have NO SMELL.

It is then OK to use on your plants as a fertiliser, foliar spray and even as a 'pick-me-up' when they need an extra boost.

WormWiz obtained from a properly maintained Worm Farm should have a neutral pH and will therefore be suitable for use on indoor plants, potted plants, seedlings, ferns, vegetables, fruit trees, lawns, etc.

WormWiz contains a multitude of micro-organisms which aid in fungal control and soil benevolent bacteria which helps stimulate micro activity in the soil.

Ensuring that your worms are fed a varied diet will result in your WormWiz containing major and minor nutrients and trace elements.

A varied diet should consist of food scraps, paper, and cardboard as well as manures / compost.

The liquid can be used neat or diluted 10:1.

There are no restrictions, use as much as you like, as often as you like.

NB. To Store the Liquid

If you are going to store your Liquid, place it in a dark cool place, as it contains living organisms and microbes.

Timing requirements: As this is not part of managing the worm bins, no timing requirements are necessary and the fertilising the garden may be done at ones pleasure.

Responsibilities: There are no responsibilities to do with managing the worm bins; the responsibility of the new organic fertiliser becomes that of who ever keeps it.

Recommendations

As this management plan is written in partnership with Kevin and Debbie Smith from The Worm Shed, it is recommended that is you have any problems, questions or queries you contact them.

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