

DIRTY WORK (BUT SOMEONE HAS TO DO IT)

From backyards to beehives, from schools to stud farms, from cafeterias to caravan parks – there’s no job too big for the humble earth worm.

For the past 10 years, A&A Worm Farm Waste Systems have been providing alternative waste treatment solutions around Australia.

Operating nationally from a Hastings base (Mornington Peninsula, Vic), what started out as an environmentally-friendly waste disposal system has grown into a national business that currently services around 5000 residential, commercial and industrial clients.

The vast majority are domestic installations, (three bedroom and above) while around 15% are divided among restaurants, farms, caravan parks, schools and unique applications.

A&A CEO Ev Duke is the wife of creator and eco systems expert, Alan Duke.

“Originally, Alan designed the system to provide an holistic approach to waste management, one that required no power (or very little) to operate and would be made from recycled materials - 98% of components are recycled.

“He was concerned about the amount of landfill Australians were creating and the amount of effluent we were pumping into our waterways. Healthy, fully functioning worm farms provided the perfect solution. Worms turn practically anything you throw at them into organic compost which can be used as fertiliser or left in the run-off trenches to be quickly absorbed into the soil.”

Duke explains that a good worm farm should be designed to be site specific, maximising safety and system performance as well as providing the least amount of risk to creeks, rivers, waterways and dams.

“We design and manufacture a system that will suit any application and then we install it. Retrofitting existing septic tanks is also usually a good option.

“Installation and ongoing servicing obligations are conducted by trained personnel. We even arrange for the council permits.”

Everything except glass, metals and plastics can go into the worm farms, including black and grey water (toilet, laundry and bathroom water), food scraps, paper and cardboard, garden waste, etc.

Black and grey water enters via underground plumbing, as it would to a septic tank or sewer, while food scraps and other composting materials can be added through a hatch in the top of the buried tank.

Worms in the chamber devour the waste, dutifully turning it into worm castings and eggs, which are carried through the trailing trenches away from the chamber, usually zig-zagging beneath the surface across a backyard, paddock, open lawn or garden area.

On hilly sites, gravity does the work of dispersing the waste through the trenches. But

Nature's garbage disposal units ... in with the bad, out with the good.

on flat or undulating blocks, a small pump does the job, usually coming on for 90 seconds in the morning and at night and using the same amount of electricity as a 100W light globe.

"The outflow is so rich in nutrients it is readily absorbed, so the trench never blocks up or needs servicing," says Duke.

"In fact, worm eggs are also carried along the trenches, which only add to the solution."

Only the hatch and the vent pipe, which aerates the tank from the bottom and keeps everything healthy inside the chamber, are visible.

"There's no bad smell, just an earthy, composting aroma - and that's only when you open the lid to add more compost."

Duke explains that if the system lies dormant for long periods, say in a holiday house installation, the worms follow suit.

"The eggs won't hatch until activated by refuse - up to two years at a time. Then enough eggs will hatch to cope with demand. There's usually only a 24-hour lag between dormant and active. It's basically foolproof."

Duke reels off an impressive array of clients, from an often vacant three-bedroom holiday house at nearby Flinders to a horse stud on the Mornington Peninsula producing 1500kg of waste per day - comprising manure, grass clippings and the horse wash down area run-off.

"That holding tank is enormous, probably half the size of an olympic swimming pool and was constructed in situ in concrete. That's our biggest."

Duke says that previously the waste was left to decompose in mounds on the property. Now, the farm's use of chemical fertilisers has disappeared because the worm farm treated waste is being used as an organic liquid fertiliser.

"The Caltex cafeteria at the Kurnell, Sydney, refinery is an interesting installation. It was our first commercial installation and Caltex's first foray into worm farms.

"Prior to our solution (which has been in operation roughly two months), the 600-seat restaurant was sending its kitchen leftovers to landfill each day.

"They contacted us via the Web when looking for an alternative solution," says Duke. "We provided the appropriate-size worm farm and now they irrigate their gardens with the waste water which is full of nutrients. A much better outcome," says Duke.

Caltex team leader, strategic environment projects, Bob Ferguson, agrees the installation is servicing the company's needs.

"There were learning curves to overcome, but these were sorted out promptly," says Ferguson.

"Initially, after being given a clean sheet of paper on which to come up with a solution, I was looking for some sort of recycling,

like composting. But composting is labour intensive and anaerobic. One of my staff suggested investigating worm farms and, after my general manager enthusiastically supported the idea, we settled on a solution.

Ferguson, whose role is to manage long-term environmental projects for Caltex, admits he knew very little about worm farms: "apart from their backyard applications."

"We are very happy with the results and are looking at another installation at our Lytton, Brisbane refinery," he says.

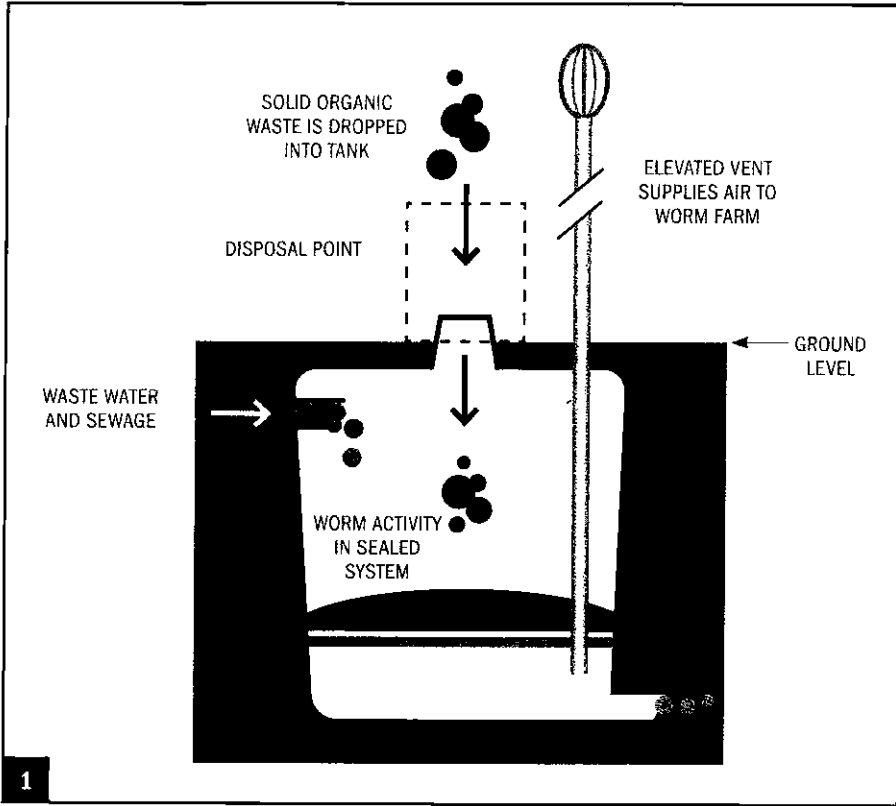
Another challenging project is processing waste wax from a Brisbane-based bee farm.

Says Duke: "The farm generates a hefty amount of waste wax which can't be sold commercially. Wax is different to most other products which go into the system so our 'test bed' found the best solution and now our worm farm up north is providing a great solution where before there was a problem.

"So far we haven't found anything organic that our worms won't eat."

At Jindabyne, the main town servicing the two major NSW ski resorts in the Snowy Mountains 450kms south west of Sydney, is a 35-unit development with its own worm farm waste disposal system comprising six systems which service six apartments each.

"We prefer clusters of apartments because the worm farms are easier to install and



1. A cross-section of a typical in-ground worm farm unit, complete with chamber, waste water and sewer inlet, vent and access/disposal point. 2. Not an eye-sore ... the disposal point and vent at Westernport Caravan Park. This backyard unit is hardly noticeable, nestled among the plants and flowers.



manage and the residents don't have to travel too far to add their own scraps to the compost.

"And because it's 26° all year-round inside the waste chamber, the worms don't have a problem with the cold. We've had enquiries from other ski lodges in the area for similar systems."

At the Westernport Caravan Park, near the mouth of Westernport Bay, worm farms service the toilet blocks and residents are encouraged to recycle their food scraps and garden clippings.

"We have four chambers located throughout the park so that the groundskeeper doesn't have to lug bins to just the one point."

The four chambers are linked to a larger chamber located on the edge of the park, which also services the toilet block.

From there, worm treated waste is pumped 200m uphill to a lush, green paddock at the rear of the property.

"Prior to our solution, the output seeped into the mangroves on the foreshore," says Duke.

The good news of successful Australian worm farms has spread through the Asia-Pacific region.

"We met the president of the Malaysian Waste Water Association at IFAT, Germany, last year," says Duke.

IFAT, the International Trade Fair for Water, Wastewater, Refuse and Recycling, in its 14th year, was held in April 2005 at the Munich Trade Fair Centre in Germany, attracting exhibitors from 40 countries and visitors from approximately 120 countries.

"We took a stand – among 2100 other exhibitors – and the Malaysian official was impressed with our technology.

"Recently, he came to Victoria to see us about buying the technology to use overseas as he is extremely well-connected in many neighboring countries. This is where we would like to see the export part of our business heading – selling the technology, not individual products, overseas."

"He says there are 20 million septic tanks in Malaysia alone that can be converted to worm farms, plus new developments."

The Dukes have since flown to Malaysia to scope out the project.

When backyard composting became the 'rage' in Australia, around 10 years ago, worm farms were almost trendy. But many produced poor results, if any, and were eventually abandoned.

"Mainly it's because they didn't have an adequate water supply," says Duke.

A&A is EPA-approved in each State and is experienced in dealing with councils to gain approvals, even for difficult sites.

"We are regulated to check the installation after the first six months, again at 18 months and then every two years, just to make sure the pumps, if installed, are operating well, the vent isn't blocked, etc. Small things, really.

"We don't hire subcontractors or plumbers to install our tanks. We pride ourselves on hassle-free installations – and word of mouth is our best marketing tool," Duke says firmly.

"It's not that we don't trust plumbers or other tradespeople, it's just that we don't want anyone installing our product who may not have our level of expertise.

"Because we don't do site inspections in advance we've even had some councils, where we've done a number of installations, contact us to warn us about a difficult site.

"But after so many installations, there's nothing we haven't seen or solved before," she says. ☐

CONTACTS

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