

PHOTOS: BAR FORMULA



It costs between RM4 mil and RM6 mil to set up a 1ha composting site

Company's waste-to-compost technology



Palm oil mill effluents and empty fruit bunches are mixed with proprietary micro-organisms to aid in the composting process

Composting plantation waste for a sustainable future

Bar Formula makes headway with its composting sites for oil palm plantations in Indonesia



by Behance Beh

MOTHER Nature is wonderful. In most instances, she has a solution in place to tackle whatever environmental woe we encounter.

To deal with organic waste, one way to break them down is composting. With the aid of micro-organisms, you get nutrient-rich fertilisers which go back into your plantation.

While the practice is being increasingly adopted by the urban farming community, one company has taken it a step further by deploying it on a larger scale.

Bar Formula Sdn Bhd operates in the bioremediation sphere, producing compost from plantation waste.

It also able to produce micro-organisms such as fungi and bacteria, which are needed to break down biomass.

Bar Formula founder Prathapan Pillai, who has a strong horticultural background, wanted to experiment with organic waste.

He started the company in 2015 and conducted trials for the technology at Sime Darby Plantations' oil palm plantations. The results were favourable and he decided to commercialise his findings.

The composting process involves two types of waste commonly found in oil palm mills and plantations – palm oil mill effluent (POME) and empty fruit bunches (EFB).

"The larger issue at hand is POME or wastewater produced during the milling process as it has higher methane content and is often released into the water stream," Prathapan's son and Bar Formula's head of corporate strategy Vijayan Pillai explains.

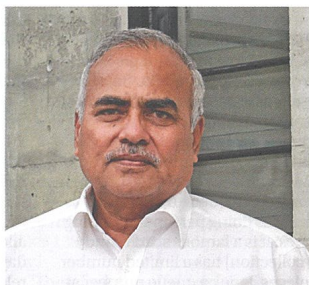
Vijayan joined his father's venture as he saw opportunities in the technology.

"Typically, POME has to be contained in special ponds for 100 to 200 days for it to be broken down before being released. However, many millers would either release the sludge immediately into the waterway or rarely meet

PHOTOS: ANWAR FAIZ AHMAD TAJUDIN/FocusM



Vijayan sees opportunities in the technology his father developed



Prathapan started the company in 2015

the minimum time required," he adds.

Bar Formula's biological waste treatment systems are designed to support microbial action breakdown of POME at an on-site facility. The nutrient-rich compost of broken down POME and EFB is then used as a substitute for chemical fertiliser on plantations.

"About 50-60% of a plantation's operational cost is fertiliser and not all the nutrients are absorbed by the oil palm. Chemical prices are currently low due to low oil prices," says Vijayan on fluctuating commodity prices.

Bar Formula's solution not only reduces waste but also produces environmentally friendly fertilisers for commercial use.

BAR Formula Sdn Bhd's technology of converting biomass and palm oil mill effluent (POME) into compost involves a simple process that involved extensive research.

It takes advantage of the decomposition of organic materials by bacterial activity. Aerobic bacteria that requires oxygen to live are used to populate and break down waste.

The stench typically associated with decaying oil palm empty fruit bunches can be traced to the dominant anaerobic bacteria which, during the decomposition process, produces hydrogen sulfide gas and other by-products.

In a typical effluent treatment plant, oxygen is added to improve the functioning of aerobic bacteria and to assist it to maintain superiority over the anaerobes. This translates to lower costs, increased capacity, and an improved quality of effluent, and even a reduction of bad odours.

Agitation, settling, pH and other controllables are carefully considered and employed as a means to maximise the potential of bacterial reduction of organics in the wastewater.

This solution helps mills address issues of environment regulation, high rainfall and high water table; all of which affect POME discharge.

On the other hand, plantations benefit from an end-product which is 50% lower in volume compared to EFB, which are rich in nutrients and easier to apply.

The company ventured into Indonesia soon after its inception as it was approached by planters and millers who were looking for solutions to deal with their plantation waste.

Vijayan says 99% of its business is focused on Indonesia. "We have built over 16 composting sites and are still operating on seven of them."

Each site generates an average of 20,000 tonnes of compost a month.

Aside from consulting work, Bar Formula's business revolves around a build, operate and transfer model where it takes care of the capital expenditure to set up a composting site and the plantation purchases all of the compost produced.

Each site typically costs about RM4-6 mil to set up. An earlier version of the composting bay would see EFB piled onto individual bays and mixed with POME and bioremediation additives

developed by Bar Formula.

It normally takes up to 60 days for the waste to turn into compost, which is measured in tonnes and sold to the customer.

"What we need is one hectare close to the mill. This is to reduce the logistics hassle of moving waste to our site," explains Vijayan.

He adds that many of its clients, while being frugal, are also aware of the long-term effects chemical fertilisers have on their soil.

"Compost helps rehabilitate the soil, especially in Malaysia where plantations are already in their second or third generation of planting," he explains.

Chemical fertilisers turn soil acidic in the long run, making it difficult for crops to absorb nutrients and this leads to lower yield.

Vijayan says the company also produces bio-based products which can address pest and weed problems on plantations. The products are able to reduce the negative impact of chemicals on the environment.

He adds it is targeting the local market while trying to increase its footprint in Indonesia.

"The plantation industry is prudent as they (owners) would stick to their old ways until it becomes a regulatory requirement. Our targets are those who are keen to maximise yield," Vijayan says.

Bar Formula's bioremediation solutions can be used for other crops such as sugarcane. It has also been approached by a pineapple plantation to explore the possibility of waste management.

Add-ons for the future

Despite its growing prospects, Bar Formula turned in a lower revenue of some US\$8 mil (RM35 mil) last year compared with US\$9 mil in 2015.

Vijayan says the poorer performance was mainly due to its move to streamline projects and discontinue underperforming businesses. Its clients include M.P. Evans Group, Austindo Nusantara Jaya, Good Hope Holdings and Genting Plantations Bhd.

"We are trying to introduce other bio-products as add-on solutions for clients," says Vijayan.

Not all business relationships are long-lasting. There were instances where the company had to exit the plantation once the contract was up.

"In most cases, plantation owners would want to continue with our services. Some may want to run it themselves and we have their team shadow ours during the last year of the contract," he says.

Although some of the planters do well in managing the technology on their own, others re-engage Bar Formula as it can be more convenient to outsource the work. **FocusM**