COULD COMPOST BE A DISEASE BREAKER?

An innovative soil nutrient program utilising compost is showing potential for sustainable disease control on Indonesian cocoa farms

BY BRAD COLLIS

In South Sulawesi, Indonesia, composting organic waste from cocoa-farming activities is becoming an important new source of soil nutrients, plus a profitable business for some smallholder farmers.

The composting initiative developed by the principal buyer of the region’s cocoa, Mars, is an example of the new ideas that are coming out of the AusAID-funded SADI initiative.

SADI—the Smallholder Agribusiness Development Initiative—is a new approach to lifting smallholder farming from subsistence levels to a more business-oriented agricultural economy. It is a partnership between a wide range of research providers, including ACIAR.

Mars started the composting initiative three years ago to help lift the productivity of its smallholder suppliers by improving their soils without the burden of costly (and sometimes difficult to obtain) chemical fertilisers.

Now the success of the program and the support shown by farmers is turning attention to the actual science of composting and the effect that soil condition has on the incidence and severity of disease.

In recent years cocoa production has been hit hard by the combined effects of pod borer (CPB, Conopomorpha cramerella), vascular-streak dieback (VSD, caused by the basidiomycete Oncobasidium theobromae), Phytophthora pod rot (PPR) and stem canker (caused by the oomycete Phytophthora palmivora), and declining soil fertility.

SADI partners are now keen to see if initiatives like the Mars compost program, which can lift soil fertility, can also diminish the impact of disease.

Further development and understanding of the relationship between soil health and disease would add an important scientific basis to the empirical work already done by Mars.

To date, Mars has undertaken extensive trials to develop appropriate processes and ‘recipes’, and portable composting machinery suitable for on-farm use. Added to this (in line with the SADI objectives) has been the development of a business model based around compost as a saleable product as well as a resource.

Some 39 farmers or farmer groups now have the mulcher/cocoa pod chopper developed by Mars engineers, producing about 12 tonnes a month of nutrient-rich compost from vegetative waste that was previously burned. The compost is prepared to specific biochemical specifications with the addition of a microorganism product made by a company in Bali.

Technical director for PT Mars Symbioscience Indonesia, Mr Agus Samil, explained that soil tests by Hasanuddin University in Makassar had shown long-term use of chemical fertilisers alone had depleted many farm soils of organic matter. Further, the Indonesian Government was limiting its fertiliser subsidies, making chemical fertilisers more expensive and potentially harder to obtain. Nutrient-poor soils loomed as a potentially serious production constraint for farmers.

In response to this Mars started looking at the possibility of large-scale composting, given the high volume of leaf matter, prunings and pod husks generated in cocoa farming.

After an initial feasibility study in 2005, the company built a small compost-processing factory in Lara, South Sulawesi. The plan at the time was to collect organic waste in a truck fitted with a large mulcher. The company began to introduce the concept of compost to its farmers, teaching them how to prepare organic waste for bagging and collection by the mobile unit. However, after the first year of operation some fundamental obstacles had emerged, such as the proximity of fields (and organic waste) to roads.

“It became clear that the composting needed to be done onsite by the farmers themselves,” Mr Samil said. “So we brought in eight small, simple, pod-chopping machines designed by Mars engineers.

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A key selling point for everyone—producers and buyers—are the results from a demonstration site comparing productivity from trees growing on 100% chemical fertiliser (urea), a 40:60 mix of compost and chemical, and 100% compost.

After two years of trials, compost continues to be the most productive source of soil nutrients.

One of the early adopters of composting, farmer Mohammed Nur, said that since switching to compost in 2005 his yields had increased from 200 kilograms of cocoa to 300 kg, or 1.5 tonnes per hectare.