

Vermiculture: earthworms should become the farmer's little workers

By Charl Pienaar (MSc Agric, MBA, earthwormaholic)

Part 2: How to use super vermicompost

Worming in

In the previous edition of Go Farming we explained how to make super vermicompost with the help of the farmer's special little workers (humble earthworms), and how they will bring along their even smaller little helpers, the beneficial micro-organisms (the good bugs).

We explained how to build a tyre stack to house your little workers, how to feed your little workers (nobody works well on an empty stomach!), where and how to find your little workers (see order form), how not to treat your little workers (otherwise they will refuse to work), and when to harvest your super vermicompost.

This second article in the series of two will complete the easy-to-follow directions for you, the African-farmer-who-cares-for-the-environment, providing more knowledge, tools and skills on how to use super vermicompost and thereby to farm more profitably and skilfully.

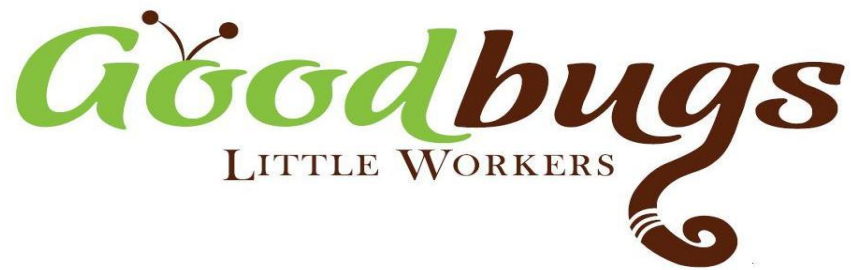
Worming towards LEISA and organic farming techniques

LEISA is short for **Low External Inputs Sustainable Agriculture**, simply meaning that instead of looking for expensive external farming inputs (chemical fertilizers, chemical weed killers, insecticides and pest control chemicals), the clever farmer should find items and materials available locally and inexpensively to do the same or better job as the expensive external inputs. For instance, a flock of geese on the farm could do a great job to keep snails and other insects under control, while at the same time providing a renewable source of meat and eggs to feed the farmer's family. And they are good for security!

In the same way super vermicompost, produced on the farm from waste materials, and making use of the free labour provided by the little helpers, could go a long way towards replacing expensive chemical fertilizers. And vermicompost is good for building up the soils, putting carbon sources and essential microbes (good bugs) back into the place where they belong, the place that Mother Nature prepared for them over the ages.

So LEISA is about helping to create a positive "balance of payments" for the farm – more money should flow in to the farm than what would otherwise flow out. One important aspect of this positive balance is to purchase as little as possible expensive external inputs for farming operations. And super vermicompost, produced on the farm, fits right into the LEISA philosophy.

Organic farming techniques go one step further, namely to receive certification (proof) that no harmful substances were used in the farming operations. Good quality compost (also certified as organic) is an essential



input for formal organic farming techniques. However, for produce to be certified organic could be very expensive, especially for a small-scale farmer. Then your pack house, cold chain and transport system also needs to be certified organic, adding more complications.

Therefore our advice for emerging farmers is to learn their trade through LEISA techniques, and not to attempt to go all the way to certified organic without having the skills and experience to make a success of that. The Internet is full of very useful tips on how to farm better with low external inputs: type "LEISA" or "vermiculture" in a search engine such as Google and you'll be amazed with the information that comes up!

How to harvest super vermicompost

Now we need to become a little more technical, since it's not so easy to separate the earthworms from the rich "black gold" vermicompost that they produced. I mean, we do not want to hurt or damage the little ones, since who will do the work then?

Some farmers use a round sieve to do the trick. They load the harvested vermicompost on a trailer, and use gravity to make the compost (and worms) roll down while the round sieve is being turned by hand. The fine compost would fall through the sieve, to be collected, while the larger worms and rough clumps of compost would roll through to be collected at the bottom. The moisture content of the compost should be just right, not too wet and not too dry. To my mind this technique is a bit too complicated, although for large volumes of compost it may be the best way.

My personal preferred technique works well; although it is slower it is much easier and less stressful for the little workers. I start building a new tyre stack next to the old one, and put fresh worm food only in the round bottom section of each tyre. I then fill the rest of the tyre with the harvested compost (plus worms), and continue with the next tyre when the bottom one is full. And so on until the stack is six tyres high. I then disturb the top few inches of compost by stirring with my hands, which causes the worms to take flight downwards. I then harvest the clean compost, and continue with this until I reach the fresh worm food. And there are all the worms, trapped in the round section of the tyre, ready to be scooped out with the fresh worm food! Clever, or what?

The little workers, embedded in the fresh compost, could then be scooped out and used to populate a new tyre stack that was previously filled with fresh worm food. And so the cycle is repeated over and over!

How to utilise super vermicompost as organic fertilizer

This part is really tricky, because soils and plants differ so much, and would require different rates of application of compost. In my own case I mix super vermicompost half-half with river sand, and the mix is used as growth medium in my desert plant nursery.



Very good results, because the mix drains very well, yet provide the desert plants with excellent nutrition from the super vermicompost.

I also apply the super vermicompost to my pot plants, and to the garden on plants such as lavender, roses, hedges etc. When planting vegetables such as tomatoes I put a handful of vermicompost in the hole where the seedling will be planted, cover with a layer of ordinary soil, and then plant the tomato seedlings on top. The initial application would probably not provide enough nutrition to see the vegetable crop through, and in that case a top dressing or liquid application (see next section) should be applied.

Obviously for commercial farming purposes a small composting operation like the one described in these two articles would not be sufficient. For soils really poor in organic content an application of 40 to 50 tons of fertilizer per hectare may be needed in the first year of converting to organic (non-chemical fertilizer) farming methods. For this volume of compost a conventional commercial composting works would be required. You will need a large wood chipper, automated compost turner, big volumes of garden refuse, clay and animal manure. We are working on methods to combine conventional compost with super vermicompost, and will be putting up commercial composting plants at the two new markets for emerging farmers at Philippi Market, Cape Town, and Ugu Agricultural Market, Port Shepstone. The conventional compost, spiked with super vermicompost, will be made available for emerging farmers near these markets through the subsidised transport linking the markets with the emerging supply base via a depot system.

How to utilise super vermicompost to fight the “bad bugs”

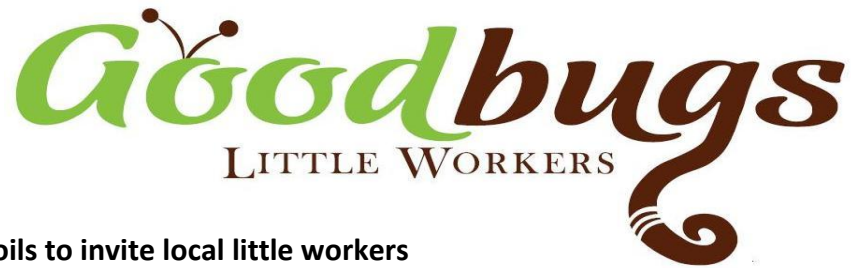
Super vermicompost can also be applied in liquid form, the so-called “worm tea”. On the Internet there are various recipes for making liquid fertilizer from super vermicompost. The recipe can be very simple for small operations, to large commercial brewing operations.

The simple recipe is as follows: take a fairly large drum (44 gallons) and cut open the top. Clean the drum properly and fill nearly to the top with clean, good quality water. Add about five kilograms of fresh super vermicompost. Use a small air pump, which could typically be purchased from a pet shop, and is normally used to aerate indoor fish tanks. The outlet of the pump should then be put into the water and allowed to bubble air through the worm tea for about 24 hours. In this time the beneficial microbes (the good bugs) increase at a very fast rate in the water, the “much smaller little helpers” I mentioned in the title of this article. After this time the colour of the water would be a rich dark brown, like strong black Ceylon tea.

This worm tea could be applied in liquid form around your plants (for fertilizer) or sprayed onto your plants with a sprayer. A small quantity of dishwashing liquid could be added to make the liquid stick to the leaves better. Remember to filter the worm tea through a cheese cloth before putting into the sprayer, otherwise the nozzle will keep on blocking.

The theory about fighting the “bad bugs” with worm tea is that you assure that the “good bugs” are present in high numbers, which would help them to chase the “bad bugs” away. Furthermore, a strong, healthy, well-fed plant would have improved resistance to fight off the “bad bugs” by itself.

The inexpensive application of worm tea should be repeated every few weeks, and just watch them plants grow!



Building up your soils to invite local little workers

In soils with high organic content there would naturally be a build-up of beneficial microbes (good bugs), which will work hard at making nutrients ready to be used by plants. And the population of local little helpers (earthworms) would also increase over time, and I have explained what important role they play to produce accessible food for plants and to aerate the soil.

Therefore the farmer-who-cares-for-the-environment should do everything possible to build up his/her soils and thereby to create and maintain conditions in the soils that would attract and protect the little workers and their even smaller little friends.

DO work in leaves, bark, chipped garden refuse, compost, and even put a layer of organic matter (mulch) on top to cool down the soils and to maintain moisture.

DO NOT turn over the soil often and thereby disturbing the fine balance, be mindful of applying chemicals that will kill the good bugs, and make sure that there is no compaction in the soil that will prevent roots to penetrate deeply and water reserves to build up in the soil.

Worming off

Well, the page is full and I need to go check on how my own little workers are doing. To me it is one of God's finest miracles to observe how humble earthworms are able to magically convert otherwise useless plant and animal wastes into rich humus ("black gold") for plants to produce the food that enriches our lives.

Happy worming!