



TARTS INITIATIVE ON HIGH-PERFORMANCE BIODYNAMIC COMPOST

PADK is an NGO dedicated to building capacity in regenerative agriculture techniques and soil science research. Our main initiative and focus, the **Tropical Agriculture Research and Training Station (TARTS)**, is in the small village of Ngotto, in the East Region of Cameroon.

Our goal at TARTS is to research, practice, and incorporate ecologically sound agricultural solutions in tropical rural communities. Our areas of research include regenerative agriculture, soil science, food security, conservation, economic development, and climate adaptation. We develop and train young students in all aspects of regenerative farming, provide them with limited but modern laboratory facilities, and guide them in developing solutions for some of our biggest problems.

The East Region is by far the most economically disadvantaged region in Cameroon. In every major domain of field research, there is significant data deficiency. Currently in Cameroon, agricultural techniques involve high levels of soil disturbance, deep tillage, and pervasive use of pesticides, herbicides, insecticides, and fertilizers.

TARTS is in the forefront of soil microbiology research in the context of degraded tropical soils. We are evaluating a full a wide range of technologies, including Johnson-Su (JS) Bioreactors, Woodrow composting, vermicomposting, aerobic compost tea extracts (using fish hydrolysates, cassava flour), Biochar Bokashi, and many others. Our implementation strategy is to use local materials, prioritize locally available biomass, and translate our findings into a model that can be easily adopted by rural populations. We currently have 1 student and our onsite agronomist enrolled in Dr Elaine Inghams Soil food Web Foundation and Microscopy classes.

Our objectives are to:

- Produce highly biodynamic and performant soil amendments.
- Restart the microbial activity of tropical soils, increasing nutrient availability, and alleviating the pressures of chemical fertilizers and pesticides.
- Increase local small-holder farmers' knowledge of soil ecology and provide them with tangible resources to improve and regenerate their farmland.

We want to highlight the incredible utility we have found in the microBIOMETER®.

Our lab protocols have always been those derived using traditional microscopy, leveraging protocols derived from Dr. Elaine Ingham, to identify the fungal to bacterial (F:B) ratios in the various projects described above. A variety of logistic factors impeded our workflow – sampling was infrequent and irregular, tracking the F: B progression was difficult, and correlating with climate data and environmental parameters was near impossible. We host 20 Agronomic students

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every year and, in their studies, and research we needed to find some field tests that were useful and adaptable in our current environment. In early 2022, our Founder, Mr. Edmond Nader, came across the microBIOMETER® purchased a test and replacement pack and instructed our lab to incorporate it into our workflows.

Since then, we have accelerated our R&D efforts, and our results have benefited from more consistent monitoring. Our compost studies are now intricately linked to the use of the microBIOMETER® and its use has strengthened the operational capacity of our laboratory and the ability of our students to better document field results for their research.

Now, we're able to:

- Process samples, measure the F:B ratio, and record the results using the mobile app's Data Capture functionality, in about 20 minutes. The data capture has been a very welcome surprise as its simple to follow the evolution of substrates tested with the database and share results.
- Correlate data from other experiments and compare against our microscopy results.
- Accurately track the shift from bacterial dominance (i.e. thermal phase) to fungal dominance in our composting efforts.

Specifically, we found that there were more fungal organisms in our samples from the vermicompost bins, compared with the thermal Woodrow compost. When we began using the JS method, we noticed the same and with this and our vermiculture we increased capacity and allowed us to go from 6 JS bioreactors to over 25 JS Bioreactors modified with local agriculture waste, in the span of just one year. We are seeing very promising results not only in the soil structure but also the increase in mycelium development and rapid decomposition into fungal dominant biodynamic compost.



Lastly, we wanted to highlight the students who are benefiting from the microBIOMETER® test. TARTS has an internship programme that enables us to take on twenty agricultural engineering students each year from the Cameroon national universities. These students are housed on our site and work for 5-6 months on their research subject for their thesis. We expose all these students to our composting and soils studies, and they all get a chance to use the microBIOMETER®, gaining critical hands-on lab experience in the process and challenging results with microscopy.

The microBIOMETER® has been an invaluable tool. It has helped our organization to better document results and follow the evolution of our efforts. We have found results to be accurate against most of our microscopy verifications and we trust the results. We are eager to share our experience with this tool with others and promote its use in sub-Saharan Africa, tropical climates, and elsewhere. There are few useful field tests available, especially useful in such rural areas as we work, the microBIOMETER® has been a very welcome addition to our laboratory and field studies.