

# Composting, why should we be doing it, or using it??

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Before we begin even thinking about what components to use, or how to do it, we need to have a clear understanding of the condition of our soil, and how it measures up against truly healthy and highly fertile soil.... What, if anything, are we trying to fix here??

Australia was an ancient, weathered, and leached continent aeons before Europeans landed (1)<sup>1</sup>. For some unknown reason it evolved without the great ever-moving herds of heavy ruminant animals that The Grasslands of Southern Africa, or the Prairies of North America were blessed with (2)... Their massive, annual contributions of healthy manure (3), with the occasional carcass thrown in (4) over the centuries were the building blocks and maintenance mechanisms for deep and fertile soil.

As we are beginning to accept that most of us need to alter our perception of our soil now, there are only a few things we really need to get our head around, and address....

\* Primarily, that soil is effectively a living entity, and that a truly healthy soil has a far bigger population, numbers wise, below the surface than above it! As ever there are both beneficials which we need, and pathogens which we do not. How we treat our soil will determine the balance, and which group will predominate.....

\* Secondly, Minerals..... absolutely essential as the building blocks of Life, but our overall knowledge is still sketchy at best... If we look at the spread of Elements in the Periodic Table, we see 90 odd that occur naturally. If they exist, they must have a purpose in Nature, though we know very little of this .... Current Research has a far too narrow focus.... and very few Researchers seem to stand back and look at the overall picture....

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<sup>1</sup> Number of slide in PowerPoint presentation

To go back to (I think) George Bush Snr's pronouncement quite some time ago:

There are things that we know, and things that we don't know....

Then there are the things we know that we don't know, and in addition,

There are the things that we, as yet, don't know that we don't know.....!!

It all becomes rather confusing, but if we can simply accept that there is stuff happening that, while we don't yet fully understand it, we need to facilitate it, then we are well on the right track!!

\* Thirdly, and finally, the critters..... Again, hard to see, and not at all well understood by most, is the active Communication System that operates very efficiently underground, where soil and living plants effectively talk to each other electrically, and have an inter-dependent life support system. Very simply this involves excess solar energy harvested by the plant through photosynthesis being passed out through the roots as a sugary exudate to feed the myriads of microscopic critters that cluster around the roots of healthy plants in a mutually beneficial association. How is this mutually beneficial you may ask??

Very simply ..... A well-fed, healthy plant easily harvests more energy than it needs for itself ... very similar to an overly large array of solar cells, which is exactly what a good leaf coverage is!! It then pumps the excess downwards and out into the surrounding soil to attract, breed, and maintain the population of beneficials .... This is the equivalent of our immune system ... should a pathogen turn up intent on damaging or killing the host plant, the beneficials will literally attack and destroy it to protect their food source ... very simple and natural ... NO TOXICS NEEDED!!!

While we are well used to pulling up plants and seeing roots looking like this (5), it is far less common to see graphic evidence like this (6) to indicate massive microbial activity in the root zone, with the buildup of early stage humus so obviously occurring...

It is all too easy to find soil (dirt more correctly) now almost anywhere we choose to look .... be it in either farming or grazing country that is in very poor condition (7) ... so much so that very few of us are familiar

with really healthy soil (8) ... Massive erosion in our farmland is commonplace now (9), yet when we head North into the country where rainfall is measured more in meters, the creeks run clear and carry no soil at all (10).

The obvious question then is ... can we possibly rebuild the degraded, almost destroyed, structure of ours to more closely resemble the healthy stuff... Think even closer to home .... within sight, up on the nearby Bunyas (11) we have the same clear-running creeks as does Tully (12)!! Not at all hard to see, this is no far-away Dreamland!!

OK, what are the requirements to effect this, perhaps gradual, transformation??

Back to the beginning, the three basics,

Organic Matter, including Soil Carbon,

A wide range of Minerals to correct the specific deficiencies of our soil,

And finally an inoculant to boost the population of beneficial microscopic critters!!

This will need to be assisted by some changes to our current farming practices to achieve the ultimate benefits, though a bit hard to handle as concept initially .....

How do we do this in practice??

Obviously, in context here, we are looking squarely at Compost as being a mechanism that can rapidly facilitate this desired transformation....

A degree of clarification is needed here ... what exactly is compost??

Basically it is the end result of the (further) digestion of animal and plant waste, completely transforming it into a substance that can be assimilated quickly and easily by growing plants, and which both conditions the soil, and feeds the plant with a healthy diet.

One of the glaring omissions in the overall scheme of things is adequate education to fill the knowledge gap... As far as I am aware, there is nowhere (in Australia at least) where it is possible to be formally taught how to make a decent Compost, or to farm biologically, ... yet anyway....

So, is it feasible to consider making your own, and what is required??

Basically, yes it is possible to make your own, but to do it really well is a process that requires a whole new and dedicated set of procedures and knowledge that is not yet readily available.... (13) We have, readily available, and locally made, some of the best equipment available, anywhere, such as this Turner and Tanker combination from JPH in Brisbane. I have been using this one for some years, the sixth version of Turners that I have used .... See no reason whatsoever to change it!!

There is much out there labelled as Compost that is far less than optimum, so it is not as easy as it may sound.... get manure, easy, put it in a windrow, easy again, turn it for a while, no problem, but why does it not do the expected job when applied?? It is very like any other manufacturing process, there are many optional steps between making an engine for an old Holden and one for a racing Mercedes ... both are petrol engines, but vastly different in performance...

My advice to you is pretty straightforward .... find, and talk to a reputable supplier in detail, to find out about ingredients, the process used, any mineral inclusions and how these are determined, and where can you find out more about the results obtained from using this stuff.

While not yet well understood in Australia, compost usage in Europe in particular goes back at least as far as written records, at least a thousand years. Obviously this was not always made with the facilities available today.... The modern Compost Turners have been developed only in the past 70 or so years as far as I can find, likely starting off with a gleam-in-the-eye of the late Fletcher Sims across in Texas, who started the show with what became the Scarab line of machines.... These in turn were developed to handle the vast quantities of manure produced by the other new development ... Feedlots, of which there are many close to here.... Feedlot manure (14) is about as close as we can reasonably get to the quantities of manure left behind by the vast migrating herds of ancient times.... However they had a geological timeframe to work with (unconsciously) for their manure to build up a healthy and deep soil structure that was capable of feeding them each year as they came past.

In our situation we are trying to reverse not just the effects of poor farming practices of the past 100 years, but eons of weathering and leaching.... a BIG ask, and something that cannot possibly be done in an

instant. While results can be seen very quickly, getting up to a high level of continued production is going to take both time and dedicated work....

Obviously you have to ask yourselves the big question then..... If I do this work to the laid out recipe, will it be worth my while????

How much of an increase would it take to be worth doing, a doubling perhaps of current yields, a trebling even?? You need to know your figures pretty carefully!!

There are a number of elements to consider... you need to know the current costs of crop establishment, right from the completion of the previous harvest.

This does not apply just to cropping operations. 5 years ago I helped a friend on a cattle breeding block up near Blackwater make 1000T of fairly basic mineralised compost with mostly locally available materials (15). He applied this to 350 acres of land he initially left as natural pasture which he has gradually oversewn with mixed pasture species. Even now, 5 years on from a single treatment the difference is remarkable! Here is Bruce in the area where we made the initial compost, the lush green lines indicate where the original windrows were (16). The area he spread it on is now going rank with the multi species planting and his cattle are struggling to make a serious dint in the growth!! (17). The predominantly visible species now are Silk Sorghum and Burgundy Bean. When I last visited some months ago their cattle looked very different to most in the region. Effectively coming out of Winter when plenty of cattle were looking very ordinary, theirs were sleek and shiny, in excellent condition, after being staged through the mineralised paddock! (18)

The biggest gains will likely be seen in areas of intensive agriculture, or in irrigated country though. Horticulture areas, such as the farm in the Bowen area where I worked for 2 years, respond remarkably .... Quite substantial, they farmed roughly 1000 acres, growing primarily tomatoes .... A chemical farm when I started, they were not interested in going down the full Certified Organic path, simply wanting the best result possible. The transition to using mineral blended compost was both easy and swift. Their ground condition was very poor in the beginning (19) and the tomatoes in that area suffered badly from Blossom-end Rot, a very common fusarium fungal disease, causing huge

losses (20). Their average pick was 130T / week for an average Annual Gross of \$14 mil....

Within the first year of operation the scene had changed dramatically! I was producing in 1000T batches (21), which they were applying at 10T/ ha, more than double what I had ever used previously, but the stakes were high.

As the mineral amendments were finessed the changes in the crop became very obvious. Blossom-end Rot, and insect attack both completely disappeared while yield and quality climbed (22), taking weekly pick up massively by year's end, to 450T .... In parallel to that, the savings were calculated for the first 3 months of the second year, including fuel and time to prepare ground, down from around 14 workings to three using a fraction of the hp needed previously (23), no more fungicides, insecticides or chemical fertiliser, double spacing plants, no more pruning ... This added up to a staggering saving on establishment costs alone for this 3 month period of \$600K!! Their figures!! The yield increase equated to an annual gross increase of \$20Mil.... Well worth the effort!

Broadacre crops cannot match that, but the potential increases available from our very tired soil through getting the nutritional requirements correct are huge!!

Sugar cane in the North is pretty contentious, it uses massive amounts of chemical fertiliser and is adjacent to The Reef. In the Burdekin the average was around 130 - 140T/ha when I started (24)... it went to well over 200T (25) and was still climbing, we used no chem fertiliser. Sugar cane is actually just a big grass....

Closer to home, Mick Dan, Australian Organic Farmer of the Year in 2021 (26), runs "Good Harvest Organic Farm" over near Maleny. They have been using our compost for about 3 years now. Their soil Carbon levels have climbed steadily from around 1% to 4.5 in the 3 years in spite of almost continuous production! They feed around 4000 people a week, cannot handle any more!! (27, 28)

Now for a really wild one...!! A very promising crop is Hemp! A couple of weeks ago the very well known and respected Entertainer James Blundell (29), who runs the Family Property down near Stanthorpe had

an Open Day to look at their first, very experimental, Trial Plot ... 9 varieties, 2 replications (30).... It is appallingly poor Traprock country, yet he had a pretty reasonable showing for a pretty rushed first ever effort!

VERY interestingly, one of the attendees was Associate Professor Guy Roth (31) from the big Narrabri Research Station. He was pretty peeved he said, looking at James' quite tidy effort! Narrabri had planted theirs on the same day as had James ...

Narrabri had zero germination, James had used our Compost under his, though lightly, and had what looked to be close to 100%!! James is looking to expand to a possible 400ha quickly as possible.... He is passionate about the benefits of Hemp Oil (32) as a human maintenance tool!

To demonstrate the efficacy of our compost, it was incorporated in a replicated wheat trial run by Elders at GRDC's Tosari research farm at the end of 2021. Our product significantly outperformed all other commercially available composts trialled by Elders and was proven to exceed the yield obtained by following the standard synthetic fertiliser recommendations with its first use. The trial also demonstrated the considerable improvements achieved in crop health utilising our highly mineralised compost. Most importantly, our compost produced the greatest increase in beneficial soil microbial populations necessary for nitrogen fixation, nutrient uptake by the plant, and carbon sequestration in the soil. (I have included the below graphics from the Elders dataset for your information. TRT53 is the standard fertiliser recommendations for that soil and crop, UTC is the untreated control). (33, 34)

TREATMENT	YIELD Grain Weight (Kg)	Stripe Rust level
Untreated Control	3200	8
Industry standard (34-7.2-0-1.3S-0.3Zn)	4132	6
Rockmin Compost	5228	1

This is a locally run, totally independent Trial ... TR2 is another locally produced "Compost", not being seen as worth persisting with by Elders.

While currently Australia shows only moderate interest in Compost use, that is not the case in the rest of the world. Back in 2017, my daughter and working partner, Catriona, and I represented Australia in the inaugural global Future Agro Challenge Entry for that year (35)... 8000 delegates from 51 countries descended on Johannesburg for the Global

Finals..... This is an organisation dedicated to maintaining world food supply. We were very much in the minority as white, English speaking people. Most Delegations had strong Government support, many had their Agriculture Minister with them (36). This gentleman was Kenya's Ag Minister, who was one of a procession coming to ask, beg almost, for our assistance in his country ... We had nothing and no-one ... and could not even get a meeting with local Ag Minister Littleproud after we returned, a fair indication of the then Federal Government's attitude towards Agriculture in general. We did return though with very heartfelt Invitations from 11 countries who were almost begging for our help to teach them how to do this .... We are currently in the process of arranging with Sri Lanka, Nigeria, Saudi Arabia, China and, if ever possible, Ukraine, who all see extreme value in learning how to make and use a similar mineralised Compost to maintain their production at a high level .....

Back to the Big Picture .... We have only one of these (37), no Plan B!!

We had better take good care of it....!!

Well worth a thought!

Thank

You.....

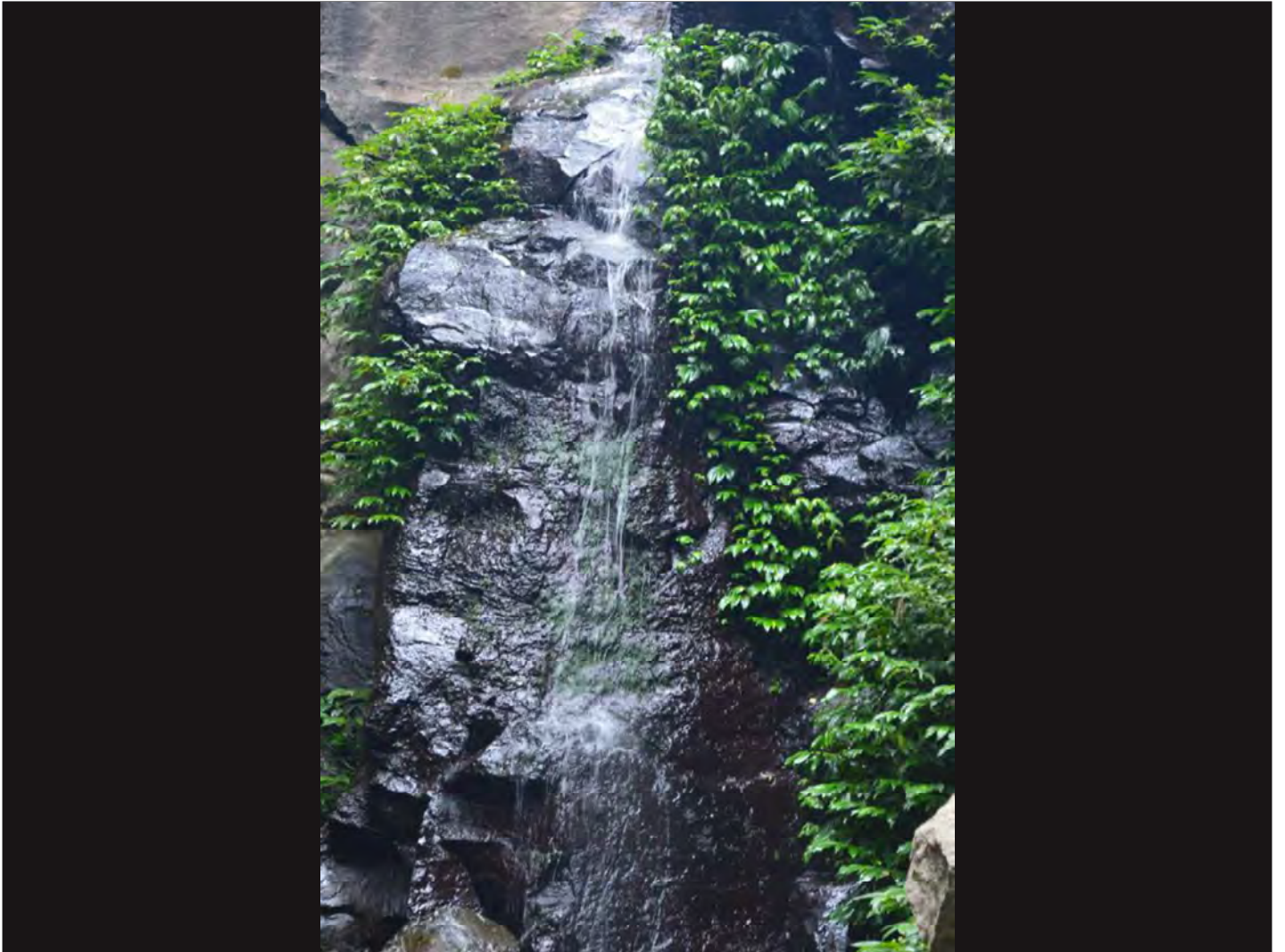
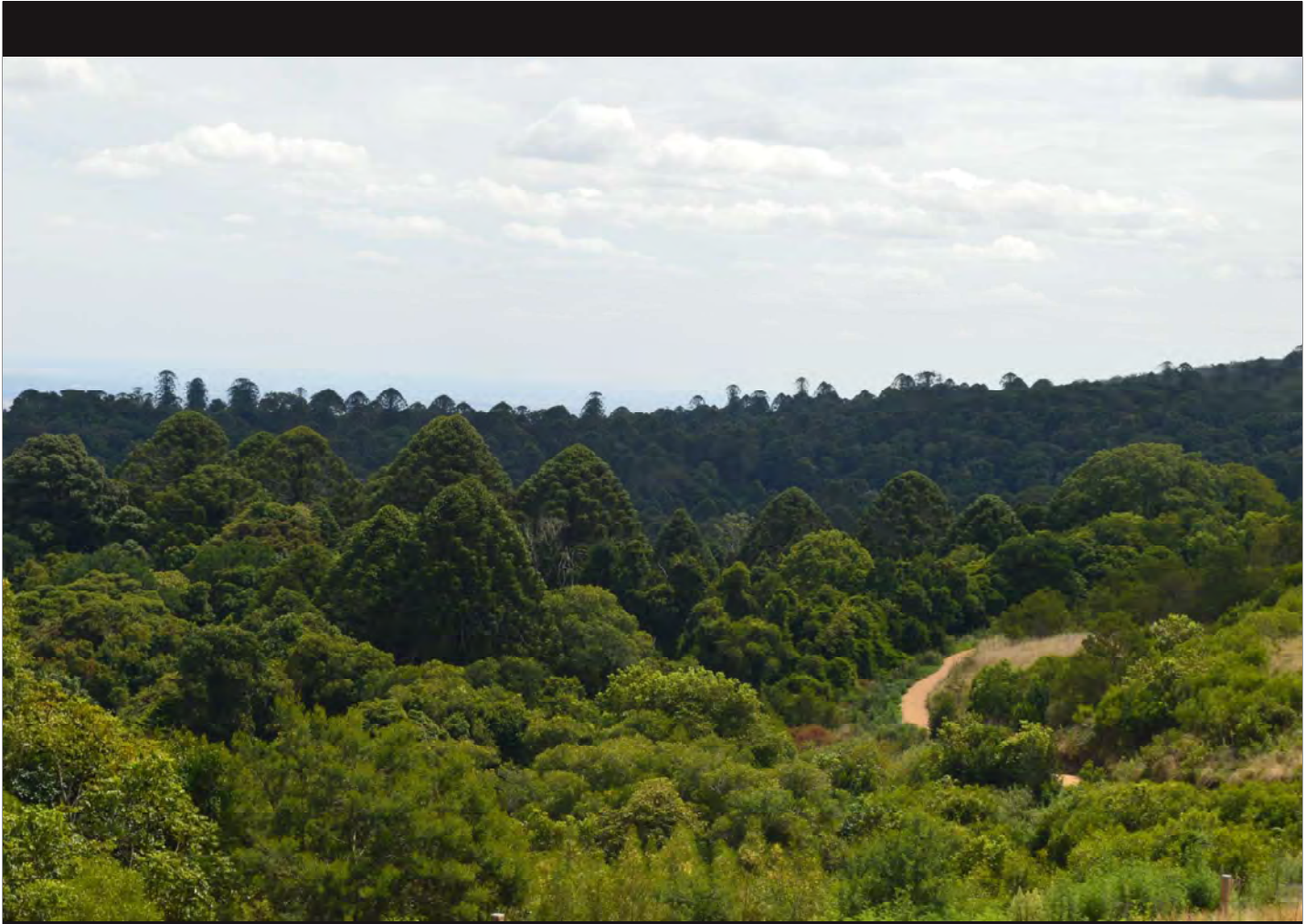






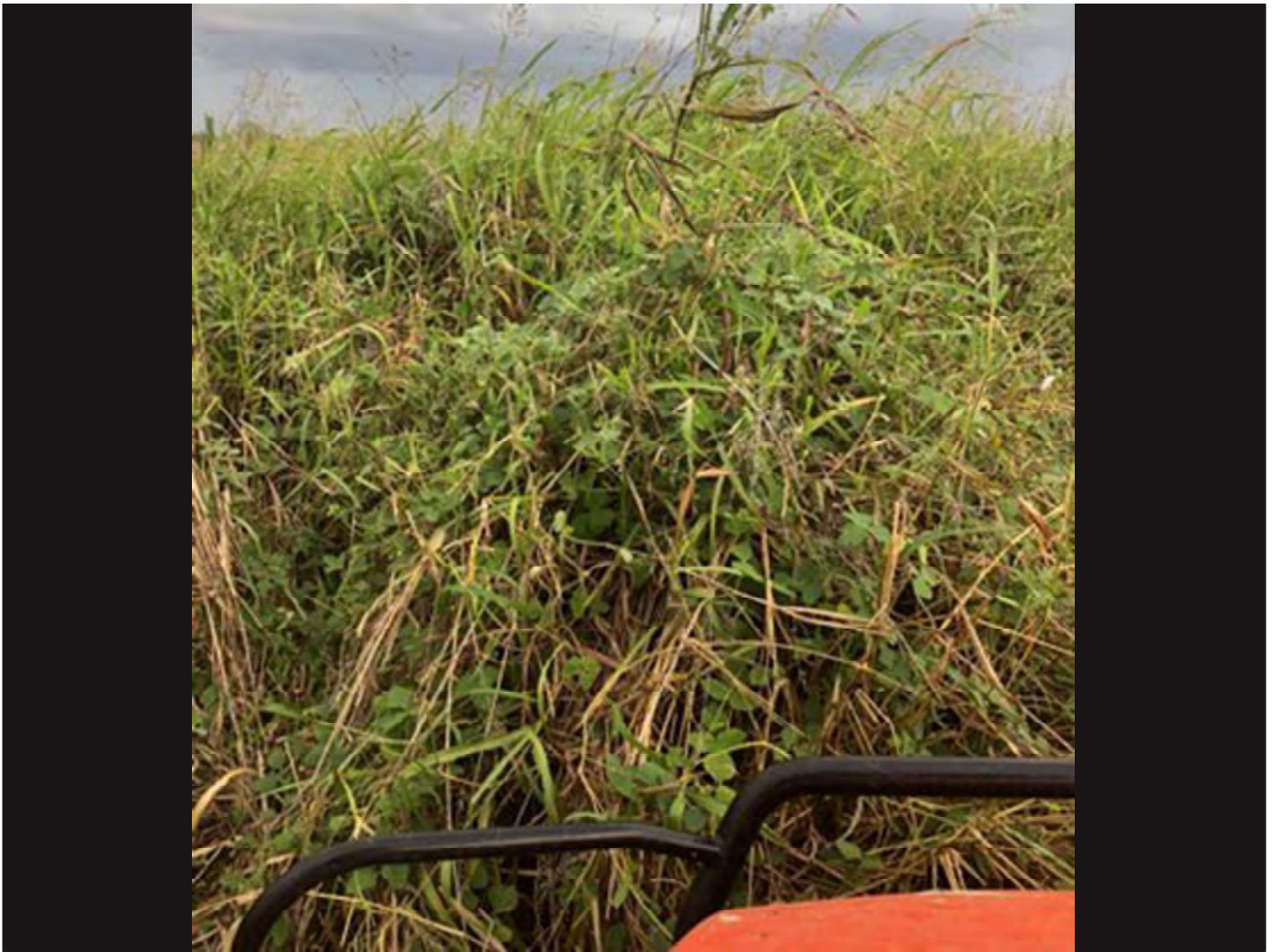


























## Final soil DNA microbial population total comparison includes unique genre

