



Positive alternatives to incineration and landfill Toward a Circular Economy

Synopsis

- The arguments against incineration and landfill from international Zero Waste networks and Global Alliance for Incinerator Alternatives (GAIA) are not resonating with the general public
- For and against are still using the same 'clean' and 'unclean' arguments used 30 years ago – we need a more focussed conversation
- A more relevant proposition is to connect recent changes in soil science with the ability to farm using biostimulants and composts – farming needs to change quickly to continue to feed humanity and directly impact and reduce the effects of Climate Change
- A broad range of food products, biostimulants and compost, can be made with pre and post-consumer food and garden materials – this makes them the most valuable products in reuse for a true Circular Economy
- Changes in food production and farming practice are essential to reduce the cost of farming and to potentially improve the quality of produce
- Everybody eats so we are all involved

Background

The arguments that have been put forward, by those of us who are opposed to incineration, have changed little over the past 30 years. Every time an incineration technology supplier convinces another ill-informed local government to commit their community to yet another outrageously expensive incineration contract, we all 'gird our loins' and rush into another expensive and emotional battle. The

technology suppliers always say their system is cleaner and less poisonous than it used to be, while we always remain against poisoning the air and argue for the community benefits of resources and jobs.

Our arguments never seem to develop into something with a more profound base. Our conversations are rightfully always against the incineration proposal but this quickly bogs down in fact and counter-fact, while the community becomes more befuddled by the arguments. Up to this point we have never seemed capable of developing a timely 'coupe de grace' on incineration, even while it stares us in the face.

I attempt herein to explain why I think an arguable and very logical proposition is with us now and, what is more, is clearly supported by recent and developing science.

One of the biggest problems facing the reuse of organic materials that are currently regarded as waste, is that the issue itself is based on the concept that the material is of little or no value. This is clearly incorrect. Science, food reprocessing and the evolving biostimulants industry are showing us the appropriate application of clean, source-separated organic material, made into the right high-quality product, is of more value than any other recycled material on a per tonne basis.

High quality compost, vermicast and other biostimulants made from previously wasted organic materials have been proven to be the potential saviour of agriculture. Food production under chemical management is on the verge of collapse. The UN reports the destruction of soils and farm incomes through the overuse of chemicals has brought us to the point where industrial agriculture has less than 60 harvests left.

The only way we are going to get the necessary political clout to change, is by getting the community to understand the urgency of this issue, and to embrace the solutions that will protect their future food supply.

Changing the words

The crucial calorific value contained in organic material must be preserved to sustain our food systems. We cannot permit the destruction of this material for the short-term benefit of bankers and the waste industry through incineration. This material is not waste!

If this calorific value was source-separated and reserved for food production, the incineration industry would have very little to burn and certainly not enough calorific value to sustain 25-year - local area contracts.

The arguments for and against incineration become irrelevant once you are aware and accept the crisis facing food production is at a critical point. The true value of organic materials to soils as clean, quality biological products, considering recent scientific developments, leaves these arguments irrelevant and hollow.

When the Zero Waste International Alliance was structured as an organisation at Beaumaris on the Isle of Anglesey in October 2003, representatives of GAIA were in attendance highlighting what had already been achieved by their group, both in terms of zero waste and opposition to incineration.

However, it was becoming clear even then to some of us, that our language was clumsy and inappropriate, even if well-intentioned. A very relevant point made by Mal Williams (currently a Board member on Circular Economy Wales) at that meeting was, 'you are better off to be in favour of something rather than against something'.

Mal's point is further highlighted when you consider any recycling program in its inception faced opposition from those supporting 'waste management' and 'incineration' systems, both of which are 100% subsidised by rates. Recycling as an 'alternate' disposal process was something we endorsed, however operations were funded from a minimal base that was initially, and inevitably, through free labour and personal savings - not public funds.

Our arguments and our moral position should now be refreshed. I would argue that in recent years, the scientific interests in the processes relating to the outputs of organic and biological systems has changed everything regarding the value of products from composts, worm farming and biostimulants as foliar applied products. This change is reflected in rapidly changing farming practices around the world.

The public shift in the awareness of the destruction of soils and water through the overuse of chemicals, the desire for clean and healthy food, increasing awareness of the need for local reliance and resilience - coupled with the effects of climate change - are driving an awareness of local and inexpensive processes either at home or on the farm. These methods help to produce cheaper, quality food, with reduced production costs to the processor, the farmer and the consumer.

We need to change our conversation in and around the recycling industry from one of 'sackcloth and ashes', to one where organic material recyclers are the producers and manufacturers of real economic solutions for local community and the long-term viability of soils and waterways.

One of the very difficult conundrums we face in the world of 'anti incineration' is that our entire conversation is of itself, 'anti'. Even the terminology we use in employment and business alternatives, such as 'recycling' or 'reuse', assume to refer generally to secondary processes that, in the eyes and minds of those receiving the service, are of less value than that which manufactured the product in the first instance. Our own terminology supports a ridiculous 'second grade' position.

Dan Knapp and Mary Lou Van Deventer of Urban Ore in California have often referred to the importance of the use of language and words and their relevance to the specifics of what we do in the industry of Zero Waste.

We need to understand that since we commenced in this important field, things have changed and we need to bring our minds to the critical issues in regard to those changes and their impact on the commercial and social viability of what we do, or could, or will be doing, in the future. The matter at hand of perceiving and developing the real economic and social benefits of change, will rely on us as an aware and active population, seeing what we do, and have done, in a different light and from a different perspective.

Much has changed since 1975 when Urban Ore started its first infant steps into the commercial world of alternatives to waste. There is an awareness among some of us both in terms of practical application and scientific knowledge, that things have changed.

The pricing structures we deal with around the world for materials which are no longer wasted are often fabricated to suit a financial system which works for the buyer and not the seller. The market for materials never was a level field, simply because recovered materials were regarded as 'recycled' waste, not virgin products. Even when the material is cleaner than the virgin ore or oil it was manufactured from initially, its value is discredited by the market because the environmental value of recovery and replacement are not fully incorporated into the price.

A few industries that resell goods and materials can make this work, but in the main, container recycling in many communities is simply regarded by government as another 'waste management' technique that requires some form of subsidy, because it is 'additional' to current practice.

But times have changed - and they needed to change. I would argue we devised our 'recycling' programs based around concepts that append to waste and not to the full environmental value of materials. We must now begin to fully pursue this environmental value, not simply because of its implications to our food chain, our water cycle and our soil qualities but, because now, our very existence may depend on it.

We must begin to recognise and emphasise the real value of the various materials in the resources we discard. To do this we must take on board the concept that soil science has developed and changed. An awareness of the animal, vegetable and mineral content of these resources are key to their use and their successful expanded application.

Within this structure we need to see the recovery of materials that sustain our soils and our water cycle are far more valuable than the glass, plastic and metals used for the packaging that encase and enfold our products. Further, we need to see that the science and understanding of the biological interaction of soils and water has changed dramatically since we first began to appreciate composting all those years ago.

Following the science

We currently exist under more threats, both existential and agricultural, than we have previously dealt with because the very soil that feeds us has been abused, and the water cycle that sustains the entire soil system sponge is fractured.¹

Co-founder of Healthy Soils Australia and international speaker, Walter Jehne, has demonstrated how we can work with hydrological cycles and the soil sponge to cool the climate and repair the serious degradation of soils, landscapes and hydrology naturally and safely.

Key to the realisation of this development is the direction that science, regenerative agriculture, changed farming practice, food production and climate awareness is taking us in the current and coming years.

In 2019, in Barcelona, Spain, 1600 people (from 72 countries and 800 companies) convened at the 4th Biostimulants World Congress. A similar number is anticipated at this year's event in Florida, USA. The increase in the use of biostimulants across agriculture and horticulture over the past 10 years has been extraordinary.² That value has risen exponentially as the realisation dawns of the true value of liquid and solid organic products and their integration into food production.

Vermicast (worm castings) and other liquid biostimulants made from a range of organic materials, are applied to crops as a foliar product. Some also are applied with great success as a seed coating at the time of planting. Such processes can dramatically reduce the need for chemicals in food production. These products can be made from a vast array of currently wasted protein sources.

Relatively recent research on the phenomenon of Quorum Sensing³ has demonstrated that biology 'talk' to each other, further that this is as true in the soil microbiome as it is in any other relevant biological field, such as composting.⁴

As this quote from Wikipedia states, autoinducers⁵ produced in Quorum Sensing are a response to changes in cell population density that can be directly affected by using quality compost or biostimulant products.

¹ Walter Jehne: Restoring water cycles to naturally cool climate - <https://soilcarboncoalition.org/walter-jehne-water/>

² Agricultural uses of plant biostimulants Pamela Calvo & Louise Nelson & Joseph W. Kloepper

³ Microbial chemical signaling: a current perspective - H.M.H.N. Bandara, O.L.T. Lam, L.J. Jin and Lakshman Samaranayake

⁴ <https://www.youtube.com/watch?v=q2nWNZ-gixl>

⁵ <https://en.wikipedia.org/wiki/Autoinducer>

“Autoinducers are signaling molecules that are produced in response to changes in cell-population density. As the density of [quorum sensing](#) bacterial cells increases so does the concentration of the autoinducer. Detection of signal molecules by bacteria acts as stimulation which leads to altered gene expression once the minimal threshold is reached.”

This is not to say soil management can only be improved with quality compost and biostimulants. Soil management practices can be affected by a myriad methods from cover crops and stock rotation to regenerative agriculture practices, farm crop diversity and many other techniques. However, if the need is to address the food production issues quickly, if industrial agriculture stops producing, then it becomes imperative that composts and biostimulants become an intrinsic part of this conversation, as this research paper by Dr. Mahesh Venkataramaiah on enriching soil organics demonstrates.⁶

As the world pursues soil carbon markets and attempts to implement the UN’s Sustainability Development Goals (SDGs)⁷ the use of alternatives to chemical fertiliser, herbicides and pesticides will be more closely policed and the need for alternatives will become more obvious. Increasing organic matter in soils enables more efficient water cycles and links directly to food, farming and nutrient.⁸

One of the greatest tools the Zero Waste movement and GAIA brings to this conversation is the demonstration of the political power of the community. The number of cities and towns around the world that have adopted the objective of Zero Waste is clear evidence communities are realising the stupidity of landfill and incineration, and they are directing their politicians to make change happen.

This is especially true when you consider that both these negative ‘technologies’ destroy the one tool that can rapidly bring about real change in our food production systems – the organic materials we waste every day. Source-separated, clean organic products are the one critical tool for a truly sustainable future.

There is no context in which setting fire to reusable and recyclable materials makes sense. Only materials that are organic in origin will burn. If you remove all the materials in any waste stream that can be recycled and all the materials that can be composted or converted to biostimulants, there is little, if anything, left to burn.

Given the depleted condition of the world’s agricultural soils, burning compostable resources that can provide much needed organic material and nutrients is truly an irresponsible and terrible waste. Up to 70% of the resources in any waste stream is potentially organic material that can be turned into high-quality compost or biostimulant and returned to our soils.

History over millennia has shown us using compost on soils raises soil organic material and increases the human ability to continue to grow food on that land. Increased soil organic material helps retain moisture, expands biological soil diversity, increases nutrient transfer, sequesters soil carbon to help reduce the

⁶ Microbes and their applications to enrich soil organics. Dr. Mahesh Venkataramaiah, Crab Fish Advisory India.

⁷ <https://sdgs.un.org/goals>

⁸ <https://www.regenerate-earth.org/what-we-do>

effects of climate change and reduces farmers input costs that can increase profits - all of which provides us with more reliable sources of food.

The UN report, which nominates the limited harvests remaining under the destructive industrial agricultural model, clearly shows we are running out of soils.⁹ This means under current management systems soils are degrading so quickly our own grandchildren's children will not have enough soil for food production. Protecting our soils is an urgent priority for all of us. We can help support food production with clean organic products.

Organic material buried in landfill is a lost opportunity – burning it in incineration is another lost opportunity – in addition, landfill, generates methane. Incineration creates dioxin, furan and toxic ash.

Joining the circle

When re-directed to agriculture, this same material can help us ensure the long-term viability of our food production systems. All clean organic material can go back to soil as quality compost if we get the material separated out from our waste streams and converted into quality organic products. Organic waste is the principal tool we have to reconnect the public to the soil as their food producer and, as such, the issue of separating organic waste from other wastes should be seen as a soil and food issue, not a waste or recycling issue.

Many local governments around the world now have source-separation systems for organic waste to reduce waste to landfill. Research has shown that given the right tools, information and motivation, individuals are readily prepared to ensure their organic waste contains no contaminants such as metals, glass or plastic and can be used to ultimately grow food.

However, to ensure we have clean products for organic use it may also be necessary to regulate, to support both producers and communities and to ensure we enforce the clean objective.

Further, if we want to achieve a supported and beneficial result to reduce organic waste, increase diversion and legally protect the community, we need to take responsibility for the outcome as national populations and under regulation. It has been done before.

There is much talk about the need to build a model for the circular economy, where the product of a process is the input for another. Reconnecting the community to the soil through their organic waste is the perfect circle of sustainability for such a circular model.

One of the greatest issues facing agriculture is soil degradation. In addition to succession, the division of land, the ownership of property and the weather, there are the ever-increasing costs of production and the pressure from large commercial retailers for lower prices.

⁹ <https://www.scientificamerican.com/article/only-60-years-of-farming-left-if-soil-degradation-continues/>

Described by one farmer as the only business where you 'buy retail and sell wholesale', farming is under ever-increasing financial pressure. Along with all these issues, is the disconnect between the producer and the consumer. In this context, one big problem facing agriculture is a lack of awareness by the consumer of on-farm production costs and production difficulties.

Also, with the national need to keep the farmer financially viable, there is an urgent need to raise community awareness of the importance of local food production, in the home, the community or on the farm. While it may be opportune for economists and retailers to search elsewhere for cheaper food in the short term, it cannot work long term. It is dangerous - socially, politically and structurally - to assume any community can purchase a substantial percentage of its food supply offshore.

Raising awareness of the need for food security, quality and quantity is crucial to national and international survival. The biggest social and political opportunity for agriculture everywhere, is to make the individual consumer aware of the importance of the producer for their very existence.

The genesis of this opportunity lies in the very soil itself.

While organic material can be built up in soils through good management, it can also be added using composts and other biologically active products. Application to farms and other sites producing local food would see all possible organic production from organic waste used within easy reach of urban centres, once an appropriate collection and reuse scheme was in place.

The potential of diverting this organic material back to farms as a clean source-separated product, brings with it the key to engaging the entire community in a focus on the importance of soils and the circle of sustainability. We all eat, so we all need to be involved at some level in food production.

To enable organic waste to be used in agriculture as a clean, quality product, it must first be collected separately from all other products. In communities where such programs have been rolled out successfully with the correct engagement strategy, it has been possible to have the urban community re-engage with the importance of farming and soil to their daily existence.

Recycling of organic waste, coupled with the message that the process is about helping to sustain agriculture, resonates with every community member, because it is about food. It is about the future, and it is about both the urban and farming family. At their very essence, humans understand the importance of food. The reuse of organic material clearly is not a waste issue, it is a food issue.

Conclusion

Encouraging the conversion of organic material into clean quality products added to soil is the only practical means we have of re-engaging the urban community with the farmer as the producer of their food - it also brings to the conversation

the local and national political power necessary to make this increasingly urgent shift.

To date, organic recycling programs have been implemented as a waste management or recycling strategy - not as a food strategy. And when implemented, they all carry varying educational messages and use different tools.

Waste management programs are generally seen as providing solutions to problems, not in building new opportunities for the community. The diversion of organic waste to agriculture is such an opportunity. It requires slightly different collection systems, new jobs in composting and new employment positions in getting compost to farms.

The savings made by diverting material from waste management systems can be channelled into creating new opportunities for the waste industry, the compost industry, and the farming industry.

The conditions of the world's soils are an issue of great importance. While farmers may be the guardians of the soils on their farms, on behalf of us all, it is the very soils they farm which feed us and our children.

The soil is your mother – everything you have been and will be depends on the quality of the food you eat. Yet humanity has been very poor at developing strategies to protect our soils and our farmers' ability to continue to produce food.

In developing new agricultural strategies it is logical that the first thing we need to ensure is that organic waste no longer goes to landfill and certainly not to incineration! This can be readily achieved with a simple law banning the dumping of any organic waste into either landfill or furnace.

Experience has demonstrated that a simple diversion of organic waste from landfill alone will only encourage the existing waste industry to attempt to build multi-million-dollar incinerators at the expense of ratepayers which pollute our atmosphere and create toxic waste, while losing all organic benefit and social connection.

It must be remembered that 30% of everything that goes into an incinerator comes out as toxic ash, destined for landfill.

The need to preserve our agricultural base is fundamental to the future of our human existence. The soil is the foundation stone of our human economy. We get food, clothing, housing, and medicine from the soil. A very high percentage of all industrial inputs come from the soil. Awareness of the true value of soil and its need for protection should be enshrined in law.

While it appears that incinerators make money by generating energy, the majority of their money is made through gate fees. They are built and paid for using household rates.

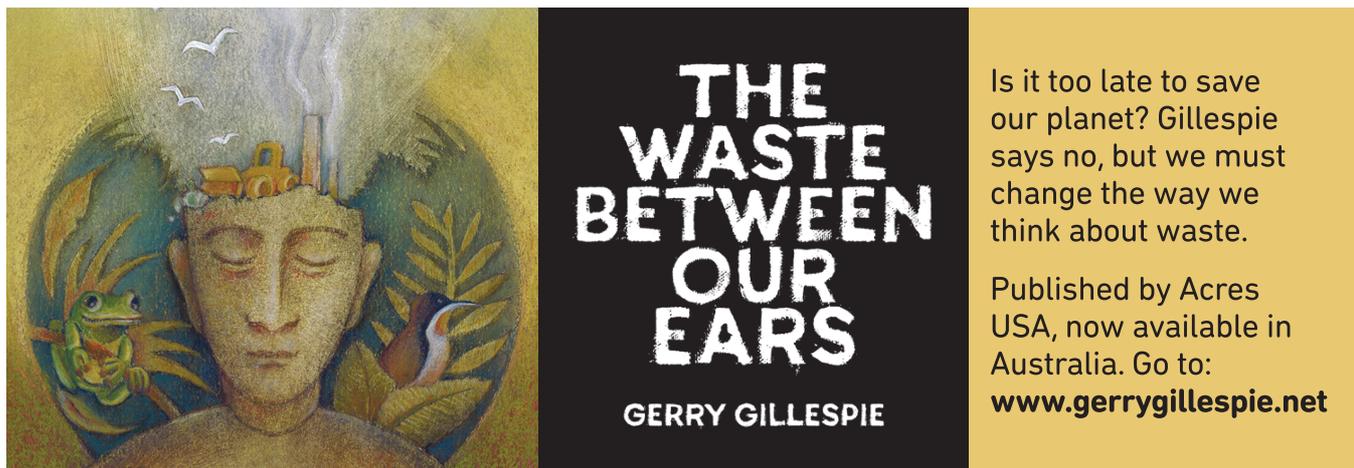
Using precisely the same investment, the same vehicles, and the same contractors, we can separate our organic waste and recyclables. We can divert a lot of the funds we are putting in landfill, into creating new jobs protecting our soils.

The removal of organic waste as a clean source-separated product for use on farms will mean that the 'yuk' factor is taken out of our mixed waste. It is when we mix food into our general waste that our problems begin.

Our conversations on these simple solutions and changing values must be key to our future conversations on landfill and incineration. The science has moved in favour of soil, and you must vote with your food.

Raising the awareness in the urban community of the soil and the farmer as the producers of food is key to the world's future and future of us all.

The soil is our mother, it warrants our protection.



**ReTuRning
ORGaNics
TO SOIL**

Gerry Gillespie
mobile: 0407 956 458
email: gerry.b.gillespie@gmail.com
website: gerrygillespie.net
insta: @gerry.b.gillespie
skype: gerry.gillespie49